ORIGINAL ARTICLE
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Developing a Culture of Safety in the Veterans Health Administration

CONTEXT. Weaving patient safety into the fabric of clinical activities is an increasingly important aspect of medical care.

OBJECTIVE. To detail the steps taken by the Veterans Health Administration (VHA) to integrate patient safety into its organizational structure.

DESIGN. Descriptive study.

SETTING. VHA.

DATA SOURCES. VHA documents, congressional testimony, the medical literature, the general press, and personal communications.

RESULTS. The VHA leadership has taken steps to promote a culture of safety by making public commitments to improving patient safety, allocating resources toward establishment of special centers, enhancing employee education on patient safety, and providing incentives to promote safety. The VHA is also establishing one mandatory and one voluntary adverse event reporting system; in the latter case, the reporter remains anonymous. Examples of nationally mandated initiatives are bar coding of all medications and use of computerized medical record that includes order entry, laboratory and imaging results, and all encounter notes.

CONCLUSIONS. The VHA's initial efforts may serve as a template for other health care organizations that wish to engineer a culture of safety. Although progress has been made, patient safety efforts require constant attention to guard against becoming a new bureaucracy or simply window dressing.

Assurance of patient safety is recognized as an increasingly important aspect of medical care. Studies have indicated that receiving medical care is risky[1] and that measures of institutional safety in health care are declining.[2] The frequency of fatal outcomes in medical care is estimated to exceed those from motor vehicle accidents and a variety of cancers.[3] Most of the errors that contribute to the risks of care appear to be preventable[4] and are attributable to systems issues.[5] Although there has been legitimate debate about the size of the problem,[6, 7] there is general agreement that the health care industry should reduce the frequency of adverse events and medical errors.

The Veterans Health Administration (VHA) is no stranger to reports of problems caused by medical errors.[8, 9] The VHA has therefore adopted a systems approach to reduction of medical errors. The key to the success of that approach is development of a culture of patient safety.[10] In the industrial world, such a culture has been portrayed as the engine that continues to propel the system toward the goal of maximum safety.[11] One way to identify the components needed to build that engine is to examine system failures in order to identify lacking components. When system failures associated with large-scale industrial disasters were compared, nine common attributes were found: diffuse responsibilities, a mindset that neglected the

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severity of risks, the belief that compliance with rules was adequate to achieve safety, lack of ability for team members to speak up, lack of sharing and incorporation of lessons learned in other facilities, subordination of safety to other performance goals, persistence of flawed design features, unused risk management techniques, and poorly defined responsibility for safety within the organization.[12]

We describe some of the steps that VHA leadership has taken in the past 3 years to address system failures and to build a culture of safety. It should be seen as a preliminary report; the goal of a culture of patient safety has not yet been achieved. Our hope in describing these efforts is to facilitate dialogue with other interested organizations and to provide examples from which other health care systems can benefit.

Public Commitment by Leadership

Management defines corporate culture.[13] In congressional testimony, the VHA's Deputy Undersecretary for Health, Thomas L. Garthwaite, MD, outlined the role of front-line employees in VHA's efforts to improve patient safety, as follows: "We have set out to create a new culture of safety in which our employees detect and tell us about unsafe situations and systems as part of their daily work."[14] Similarly, in a jointly written paper, VHA's former Undersecretary for Health, Kenneth W. Kizer, MD, defined the primacy of patient safety in health care: "The medical imperative is clear: to make health care safe we need to redesign our systems to make errors difficult to commit and create a culture in which the existence of risk is acknowledged and injury prevention is recognized as everyone's responsibility."[10]

The VHA leadership codified its commitment to achieving a culture of safety through partnering with other interested organizations and acting on the recommendations of its affiliates. A founding member of the National Patient Safety Partnership, along with the American Association of Medical Colleges, the American Hospital Association, the American Medical Association, the American Nurses Association, and the Institute for Healthcare Improvement, the VHA has taken action on all of the Partnership's recommendations.

With these public comments and actions, leadership has acknowledged and underscored the inherent risk of health care, highlighted safety as an important topic, disavowed acceptance of current design practices that may be flawed, and clarified leadership responsibility for safety.

Establish Special Centers To Direct Safety Efforts

In 1998, the VHA established a National Center for Patient Safety to coordinate and lead the development of

TABLE 1
Special Centers To Direct and Improve Patient Safety Efforts

CENTER	PURPOSE	CONTACT
National Center for Patient Safety	Established in 1998 to coordinate and lead the development of a culture of safety within the VA system; the annual budget is about $2 million	James P. Bagian, MD, PE ncps@med.va.gov
Safety Centers of Inquiry		
Palo Alto, CA	Research on patient safety in the operating room and use of simulators to train anesthesiologists	Dave Gaba, MD gaba@stanford.edu
Tampa, FL	Research on the idealized room for the elderly patient and on reduction of patient falls	Audrey Nelson, RN audrey.nelson@med.va.gov
Cincinnati, OH	Research on mechanisms to prevent errors at the provider–patient interface	Marta Render, MD marta.render@med.va.gov
White River Junction, VT	Research on diffusion of innovation in patient safety and delivery of collaborative learning sessions with the Institute for Healthcare Improvement	William B. Weeks, MD, MBA william.weeks@med.va.gov

a culture of safety. One of us (JPB) serves as the Director of the Center and answers directly to the Under Secretary for Health. He has widespread authority and responsibility for the oversight of patient safety efforts across the VA system.

In 1999, four Patient Safety Centers of Inquiry were funded through a competitive process. Ten regional applicants wrote a grant describing the proposed activities of the center; four centers were selected for funding, each with an annual budget of approximately $500,000. As shown in **Table 1**, each center has a primary focus on a different aspect of research in patient safety. The centers of inquiry are philosophically aligned with the National Center for Patient Safety, which is increasingly involved in coordinating and using the findings of the centers. In essence, the Patient Safety Centers of Inquiry are research and development centers; the National Center uses their findings to promote a culture of safety.

Through development of these special centers, VHA leadership has again underscored the importance of patient safety. The goals of the centers of inquiry are to identify flaws in patient care processes and make improvements. The coordinated relationship between the Patient Safety Centers of Inquiry and the National Center for Patient Safety allows for sharing of lessons learned. The ultimate responsibility for the patient safety agenda clearly resides with the National Center for Patient Safety.

The National Center for Patient Safety is managing the educational processes being used to develop a culture of safety. The open sharing of lessons learned on several topics through the VA's Virtual Learning Center's Web site provides a mechanism for passive learning. By serving as a national repository of front-line innovation, the searchable Web site promotes sharing of lessons learned across facilities. The National Center for Patient Safety is in the process of developing a more specific, comprehensive site that will address issues related to patient safety ranging from lessons learned to advisories, alerts, training, and educational materials (www.ncps.gov). Links to patient safety–related educational materials, research efforts, and lessons learned are provided on the Web site.

With input from quality managers and risk managers in the field, the National Center for Patient Safety has developed a patient safety handbook. As a critical part of the roll-out of this handbook, the Center has provided direct, didactic, problem-based learning to front-line personnel of all VA facilities across the United States. The handbook includes definitions, instruction on a systematized method of prioritizing patient safety issues,[15] and education on root-cause analysis. It is integrated with innovative computer-aided reporting and analysis tools to ensure that appropriate corrective actions are developed and implemented. The roll-out process incorporated an educational component designed to promote reporting of patient safety, to increase knowledge and use of risk management techniques, and to encourage members to question and intervene when issues of safety become apparent.

Provide Incentives To Promote Safety

Alignment of economic and other incentives to performance goals enhances organizational performance.[16] As

TABLE 2
Incentives To Promote Patient Safety

VARIABLE	PATIENT SAFETY AWARDS PROGRAM	INCLUSION OF PATIENT SAFETY PERFORMANCE IN CONTRACTS
Incentive type	"Carrot"	"Stick"
Target group	Providers/employees	Leadership
Description	Financial awards as high as $5000 are awarded to individuals and teams for new approaches to safety; about $35,000 has been awarded to date	Each network chief executive officer must sponsor patient safety initiatives to fulfill contractual obligations
Sample initiatives	Improvement of medication delivery system Improvement of environment of patient care	Efforts to reduce patient falls Improved transfer coordination Improved medication administration Improved scheduling of follow-up appointments

shown in **Table 2**, the VHA is using both a "carrot" and a "stick" as incentives.

The "carrot," cash and personal recognition, is for employees. Front-line employees who design, implement, or solve patient safety issues can be nominated for a patient safety award of up to $5,000. Since the program's inception in 1998, more than 25 awards with a total cash value of approximately $35,000 have been distributed.

Leadership gets the "stick." The VHA is organizationally divided into 22 regionally defined networks. Each network has a top leader, the network director, who has broad authority over resources and operational decisions. Network goals are aligned to national goals through contracts with the network director; these contracts include expectations of performance as measured by the VHA's performance measurement system. Failure to perform can result in termination. The demonstration of improved patient safety has been incorporated into this performance measurement system. Patient safety initiatives are developed at the network level in addition to the national level, so that each network can develop initiatives designed to meet specific population needs. These initiatives and their results are then shared with the entire VA system and are considered for more widespread implementation as primary performance measures.

These two approaches again highlight the importance of patient safety and underscore leadership responsibility for implementation of patient safety efforts. The awards program has encouraged innovation and creativity that moves employees beyond the belief that unquestioning blind compliance with rules is adequate to achieve safety.

Improve Reporting Systems

A critical aspect of achieving a culture of safety is encouragement of error reporting. Only by knowing what we are doing can we improve; however, the literature indicates that medical errors are severely underreported.[5] Data collected by the VHA over 18 months indicate that the frequency of reporting adverse events varies substantially.[17] As shown in **Table 3**, the VHA has taken two approaches to improving reporting of errors.

First, in 1997, the VHA developed the VA Patient Safety Event Registry. **Figure 1** shows how the reporting process has changed since the establishment of this registry. Before 1997, adverse events and lessons learned about potentially preventable errors were not shared with the system. Now, with a mandatory reporting system, the VHA more effectively catalogues adverse events. Through systematic review of adverse events, regional and national leaders can identify trends and areas on which to focus patient safety interventions. This registry was a common source of ideas for the regional patient safety initiatives mentioned above. The system is currently being modified on the basis of this input to increase alignment with the new patient safety handbook, to make reporting easier to complete, and to enhance the ability of regional managers to perform national analyses. In particular, increased emphasis on the value of reporting and analyzing "close calls," together with the removal of non–value-added tasks, has led to increased support by front-line personnel.

Second, because it is practically impossible to truly mandate reporting, the VHA has entered into an agreement with the National Aeronautics and Space Administration to develop and administer a voluntary

TABLE 3
Adverse Event Reporting Systems

VARIABLE	PATIENT SAFETY EVENT REGISTRY	DEVELOPMENT OF NATIONAL REPORTING SYSTEM WITH THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Use	Mandatory	Voluntary
Reporter identity	Recorded	Anonymous
Notes	The registry is in the process of being reformulated for the following reasons: To be consistent with the educational training and the patient safety handbook To make data entry easier and thereby encourage reporting To make clearer that this is a tool for learning, not punishment	This system is being designed as an externally run, independent entity so that other health care systems can use it in the future

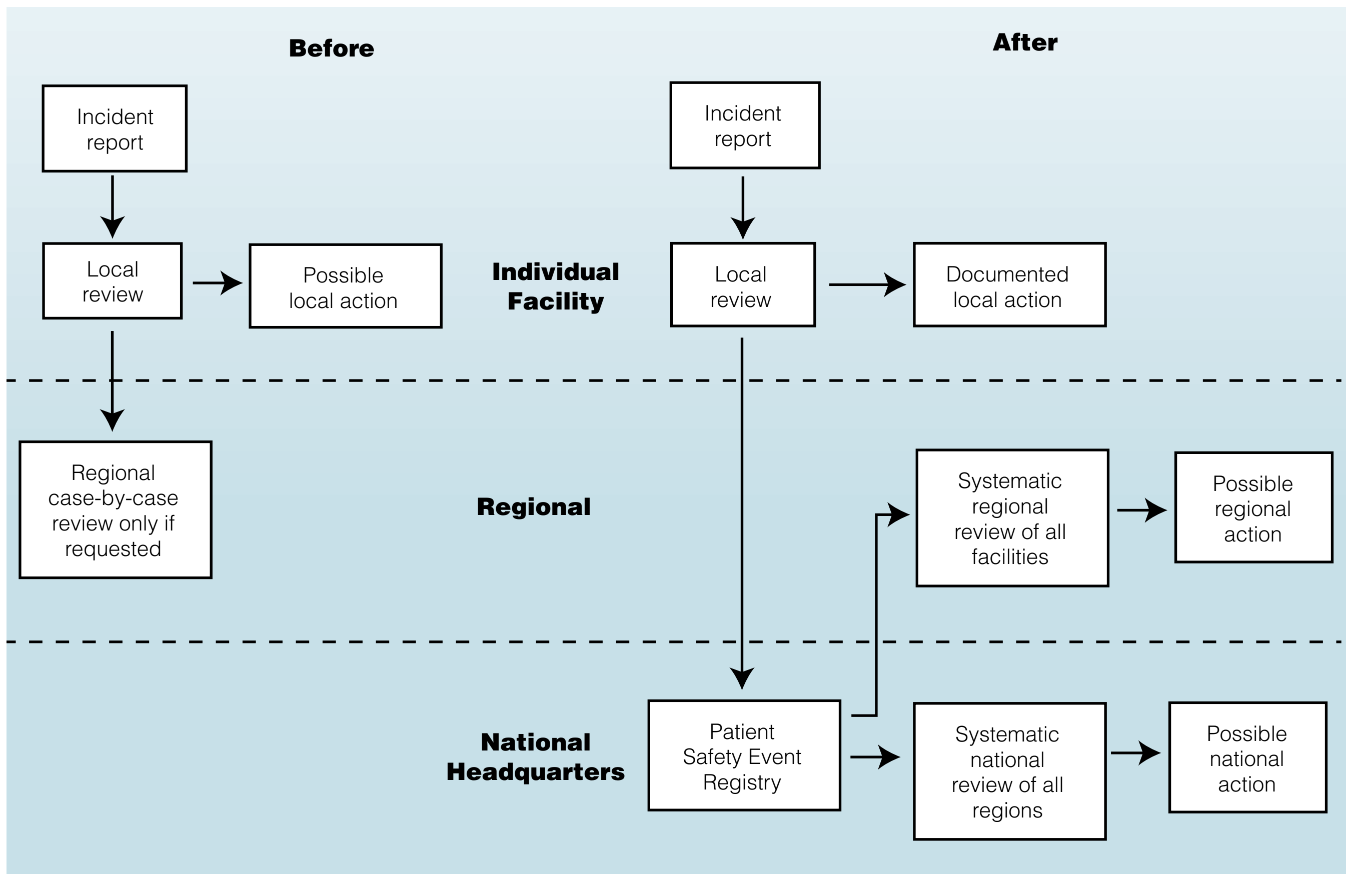

FIGURE 1. Comparison of the adverse events review process before and after the Patient Safety Event Registry.

Patient Safety Reporting System. This system uses elements of the Aviation Safety Reporting System, which has been demonstrated to be effective in helping the aviation industry achieve a culture of safety.[18] The voluntary system will be run by an external, independent entity and is being designed to accommodate the future addition of other health systems, whether public or private. Because the data sources are anonymous, the system encourages reporting by allaying reporters' fears of punitive action. The voluntary system will complement the mandatory system, thereby allowing for a more complete picture to be formed than can be achieved using the internal system alone.

By establishing parallel systems, the VHA expects to learn about barriers to mandated reporting and about otherwise unrecognized vulnerabilities. These enhanced reporting systems will allow team members to speak up. The data obtained will enhance learning across institutions and underscore the risks inherent in medical care delivery.

Specific Initiatives To Improve Patient Safety

Table 4 gives examples of specific initiatives to improve patient safety. Some of these initiatives, such as bar coding of medication and use of a computerized medical record, require substantial technological investment. These efforts were mandated because of the organizational expense involved, the importance of use of single standards, and the reengineering required to incorporate the technology. Bar coding of blood and blood products was nationally mandated in part because of the findings of an investigative council that reviewed several fatal transfusion errors. Driven by suggestions from accrediting bodies and by the simplicity of the process, removal of concentrated potassium chloride from inpatient units was also nationally mandated.

Other patient safety improvement efforts include standardization of heparin dosing, increased use of warfarin clinics, use of "double-check" systems to ensure accuracy of mixing of intravenous solutions, and protocols to ensure adequate follow-up of high-risk populations. These improvements have been achieved on a facility or regional basis but have not been mandated nationally.

Challenges

Although the VHA has made progress toward achievement of a culture of safety, several challenges

TABLE 4

Examples of Specific Initiatives To Improve Patient Safety

TYPE OF IMPROVEMENT	PROBLEM	INITIATIVE
General improvements	Errors in medication administration	Bar coding all medications
	Poor legibility of charts; charts unavailable for the clinical encounter	Computerized medical record, with integration of laboratory, radiology, and consult information
	Lack of allergy status documentation	Use of forcing functions in computer systems to prevent distribution of medications without documentation of allergy status
Improvements to address specific problems	Risk for transfusion error	Blood and blood product bar coding
	Risk for use of concentrated electrolytes	Removal of concentrated potassium chloride and other electrolytes from inpatient units
	Underuse of warfarin clinics	Standardization of follow-up in warfarin clinics; use of computer systems to identify patients receiving warfarin and to assure follow-up
	Improper mixing of IV solutions	Purchase of standardized IV solutions; no mixing allowed on inpatient units; use of double-check systems
	Use of heparin at subtherapeutic doses	Weight-based heparin nomogram; use of low-molecular-weight heparin
	Polypharmacy in elderly persons	Use of pharmacist review functions; use of computer systems to identify high-risk patients to providers

remain. These challenges underscore the fine line that this movement must tread. First, the patient safety effort within the VHA must avoid becoming a bureaucracy. The challenge is to provide the necessary support and infrastructure without impeding innovation, creativity, and rapid cycle improvement. Second, the patient safety effort within the VHA must continue to be viewed as a high-priority program with demonstrable leadership support that is continually reinforced. Patient safety is an integral and fundamental component of quality of care. Efforts to improve patient safety should be prioritized, adequately funded, and integrated into the way in which business is conducted in the VHA. The challenge is to achieve a culture of safety asymptomatically, with the realization that the target is always moving. Finally, this culture should be developed in a strategic, focused manner. While the culture should ultimately permeate the way in which the VHA does business, this can only occur over time and cannot be achieved through mandate alone. People must be "invited to play"; they cannot be ordered to do so. Supplying providers with tools that enable better outcomes to be achieved will shape behavior, modify attitudes, and in turn change the culture. The challenge is one of prioritization, timing, and most important, gaining and maintaining the trust of front-line personnel so that the goals of this effort are aimed at prevention, not punishment.

The VHA is undertaking a cultural transformation to improve patient safety. Although much ground has been covered, we still have far to go. But the effort is sustained by motivating moral imperatives. First, our front-line employees have a genuine desire to serve those who have served them. Second, like all health care organizations, the VHA has been increasingly motivated by quality and customer service issues. The very foundation of these issues is the medical dictum "primum non nocere." The best way to systematically do no harm is to

address the issues of adverse medical events and error from the larger systems perspective. Finally, almost every health care provider eventually will be a patient and therefore has an interest in the consumer's side. No matter what perspective it is viewed from, improving patient safety is the right thing to do.

Take-Home Points

- **The Veterans Health Administration (VHA) has made a public commitment to make patient safety an integral part of its organization.**
- **To integrate patient safety throughout the system, the VHA has established a National Center for Patient Safety and four Patient Safety Centers of Inquiry, each of which conducts research on a different aspect of patient safety.**
- **To help identify system-wide problems, the VHA has established a mandatory national reporting system.**
- **Perhaps the most concrete steps taken to improve safety have been bar coding of all medications and a computerized medical record that combines order entry with laboratory, radiology, and consult information.**
- **Ensuring that patient safety efforts do not become just another bureaucracy will require constant reevaluation.**

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