Chapter 40. Promoting a Culture of Safety

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Background

In a number of high hazard organizations, where the risk of error involves dire consequences, leaders manage for safe, reliable performance. As a result, the term *High Reliability Organization* has been coined to describe organizations with exemplary track records of safety: aviation, chemical manufacturing, shipping, nuclear power production, and the military.[1-10] This concept is rooted in the analyses of errors that reveal organizational failures, along with technical failures (related to system performance) and human limitations (related to human behavior).[11]

Theories about antecedents to accidents abound but major schools of thought include Reason's belief that a number of latent factors embedded in organizational systems can align and result in accidents,[12-14] and Rasmussen's approach to categorizing the different sources of error that interact with latent factors to produce accidents.[15-17] Another school of thought, developed by Charles Perrow and first publicized shortly after the Three Mile Island nuclear accident, *Normal Accident Theory*,[18,19] emphasizes the ever-present possibility of accidents in organizations that exhibit complexity and "tight coupling" of processes and the inevitability of accidents. *Normal Accident Theory* stands somewhat in opposition to *High Reliability Theory*, which holds that accidents can be prevented through organizational design and management. Scott Sagan's analysis of the nuclear weapons industry, addressing the question of why there has never been an 'accidental' nuclear war, represents a fascinating investigation of a test case for these two schools of thought.[20] Despite the obvious apparent confirmation of the *High Reliability Theory* perspective (ie, such an accident has thankfully never occurred), Sagan uncovers a surprising amount of evidence that also seems to confirm the *Normal Accident* perspective.*****

Regardless of the underlying theory, health care is vulnerable to error. The application of safety promotion theories utilized to positive effect in other high hazard organizations are being considered for health care, where "accidents" tend to occur one person at a time instead of in sweeping disasters.[25]

Attention to organizational issues of structure, strategy and culture may be a promising direction for medicine. Although organizational elements are intertwined and must be aligned for optimum performance[26] this chapter focuses on the culture component, especially "safety cultures." Following a description of the prevailing models of culture and safety, we review approaches that both medical and non-medical industries have used to promote a culture of safety. On the medical side, the discussion is limited to the Veterans Health Administration's comprehensive safety initiative.[27] On the non-medical side, specific methods other high

* Invited commentaries on Diane Vaughn's in-depth analysis of the Challenger crash[21] also provide an interesting comparison between the *Normal Accidents* [22] and *High Reliability Theory* [23,24] perspectives and indicates that they are more complementary than contradictory.

reliability industries have applied to promote a safety culture,[4] including a behavior-based industry approach, are reported.[28]

Organizational Culture

Helmreich defines culture as "a complex framework of national, organizational, and professional attitudes and values within which groups and individuals function."[29] Corporate culture is often referred to as the glue that holds an organization together, and is therefore assumed to be a contributor to organizational performance by socializing workers in a way that increases commitment to the goals of the entity.[4,30,31] As such, it embodies the philosophy of senior leaders, which is translated into, and affects the behaviors of employees.[32] Although some schools of thought focus on the role of leaders of an organization (board members and executives), others note that middle management likely plays a substantial role as well, conveying the culture to front-line workers in any organization, as evidenced by studies of the effective use of total quality management.[33] The power of culture often goes unrecognized, since employees may assume that the dominant paradigm is simply "the way we do things here."[29]

Safety Culture

While an exact definition of a safety culture does not exist, a recurring theme in the literature is that organizations with effective safety cultures share a constant commitment to safety as a top-level priority, which permeates the entire organization. More concretely, noted components include: 1) acknowledgment of the high risk, error-prone nature of an organization's activities, 2) blame-free environment where individuals are able to report errors or close calls without punishment, 3) expectation of collaboration across ranks to seek solutions to vulnerabilities, and 4) willingness on the part of the organization to direct resources to address safety concerns.[3,4,29,34-36] Based on extensive field work in multiple organizations, Roberts et al have observed several common, cultural values in reliability enhancing organizations: "interpersonal responsibility; person centeredness; [co-workers] helpful and supportive of one another; friendly, open sensitive personal relations; creativity; achieving goals, strong feelings of credibility; strong feelings of interpersonal trust; and resiliency."[4]

Culture Surveys

The aspect of organizational safety culture that may be visible or measurable is sometimes referred to as the safety "climate," which includes management systems, safety systems, and individual attitudes and perceptions.[32] Health care organizations are now adapting safety culture and climate surveys from other industries to benchmark and identify potential deficiencies in their unique safety culture. Kaiser Permanente, the oldest and largest not-for-profit health maintenance organization in the United States, has administered an executive attitudes and beliefs survey to identify perceptions of patient safety for the purposes of planning and measurement (written communication, February 2001, Suzanne Graham). The VA Palo Alto Patient Safety Center of Inquiry and Stanford University's Center for Health Policy/Center for Primary Care and Outcomes Research are conducting a patient safety culture survey that builds on past work by Gaba and collaborators. The survey includes items on production pressures and safety consequences, and draws from several other sources (personal communication, June, 2001, Sara Singer). Spath provides a checklist of elements that health care managers can use to identify which cultural elements should be addressed in order to improve safety[37] (Table 40.1). Previous work in assessing organizational culture effects on total quality management,[38] and

organizational culture in high reliability organizations[39] may also be pertinent to efforts to measure culture and its consequences for patient safety.

Industries Outside Medicine

Promoting a culture of safety has historically been a priority for the chemical, electrical, food processing, petroleum, plastic, and transportation industries. Since the 1930s, safety managers within various industries have recognized that most occupational injuries have a strong behavioral component, typically rooted in the safety culture.[28] In these settings, behavior analysis has been used as an approach to solving safety problems. Behavioral analyses typically involve assessing upstream and downstream behaviors associated with the problem, with further analysis as to which behaviors may be modifiable. Once relevant behaviors are identified, a behavior change intervention is implemented, and behavioral changes are measured. Interventions are customized, and draw upon techniques of behavior science, organizational development, safety science, and quality. Researchers have shown associations between behavior-based safety programs and reduced rates of accidents.

In an extensive field study of three organizations (nuclear aircraft carriers, a nuclear power plant, and the Federal agency responsible for air traffic control) whose operations have the potential for widespread harm, Roberts et al proposed several management processes that "cradle" a culture of perfection.[4] One process requires distributing decision making, while having mechanisms that allow decisions to migrate up and down the chain of command as circumstances develop. The mechanism for localizing decision making is often extensive training, while the approach to moving decisions to higher levels is based on management by exception when acceptable operation is in question. Finally, these researchers suggest that both top-level managers and local operators develop a deep understanding of their organizations, and use this "big picture" perspective to provide intuitive judgments when situations arise.

Practice Description

Veterans Health Administration Approach

The Veterans Health Administration (VHA) has implemented a multifaceted safety initiative, which was designed to build a culture of safety and address system failures.[27] The approach consists of 4 major elements: 1) partnering with other safety-related organizations and affiliates to demonstrate a public commitment by leadership, 2) establishing centers to direct safety efforts, 3) improving reporting systems, and 4) providing incentives to health care team members and division leaders. These tactics are detailed below. In addition, several specific initiatives were implemented to address problems, such as bar coding of medications (Subchapter 43.1) and use of computerized medical records.

To demonstrate a public commitment to the importance of patient safety, the VHA leadership founded the *National Patient Safety Partnership*, along with several major health-related organizations (the American Association of Medical Colleges, the American Hospital Association, the American Medical Association, the American Nurses Association, and the Institute for Healthcare Improvement). In addition, key senior management officials sounded the safety message in congressional testimony.

The second part of the VHA's approach involved establishing centers dedicated to the promotion of patient safety. The first of these was the *National Center for Patient Safety*, which directs patient safety efforts for the VHA at a national level. The Director of the Center oversees patient safety efforts for the entire VHA health system and is a recognized authority.

Subsequently, four Patient Safety Centers for Inquiry were funded, which are primarily responsible for safety-related research and development. Specifically, the centers are responsible for identifying problems in the patient care process, implementing corrective measures, and studying effects. Currently, one of these centers is studying safety cultures in health care organizations. Finally, the *VHA's Virtual Learning Center* contributes to the safety initiative by allowing VHA facilities to share lessons learned. Additional information, such as training, educational programs, alerts, and advisories are planned.

The third major component of the VHA's initiative involves *incentives* aimed at improving safety. There are two types of incentives offered: 1) the "carrot," which is a monetary award of up to $5000 for individuals and teams that develop approaches to improve safety issues; and 2) the "stick," which is a performance expectation imposed on leaders to improve patient safety. Leaders of the VHA's 22 regional networks must demonstrate involvement in safety-promoting activities, or be subject to consequences, including possible termination of employment. The primary objective of this incentive is to align regional and national leaders' goals.

Last, the VHA has implemented a two-pronged system for capturing adverse events. The first of these systems, the *Patient Safety Event Registry*, mandates reporting of adverse events and “close calls” occurring within the system. Before implementing the Patient Safety Event Registry, regional review of event cases was sporadic. After implementation, event data is systematically shared both regionally and nationally. The second of the systems, the *voluntary reporter identity system*, was developed in conjunction with the National Aeronautics and Space Administration, and allows for anonymous event reporting. It is intended that the use of both reporting systems will together provide a more comprehensive picture of safety management than would be possible with one system alone.

Behavior-Based Safety Programs

Outside of medicine, the objective of behavior-based safety interventions is to reduce incidents by managing at-risk behaviors of the organization and work teams. An approach described by Krause and colleagues consisted of safety assessments, steering committee formation, development of checklists of well-specified critical behaviors related to safety, observer training regarding the critical behaviors, observation and feedback.[28] These steps, somewhat analogous to aspects of crew resource management training approaches (see Chapter 44), most likely reflect an active safety culture. The Krause study assessed the effectiveness of behavioral safety initiatives in reducing accidents in 229 facilities in various industries, including chemical, electrical, food, plastic, petroleum, transportation, service, and paper manufacturers.[28] The study used an interrupted time series design with the participating industrial sites. Event rates after implementation of the behavioral program were compared with the Occupational Safety and Health Administration (OSHA) recordable illness/injury rates. Of the 229 participating sites, 73 provided necessary data (others were excluded either because they failed to provide OSHA illness/injury rates or results of the behavioral initiative). Compared with baseline, the behavioral initiative resulted in an average 26% improvement in targeted safety behaviors during the first year, which rose to 69% by the fifth year.

Prevalence and Severity of the Target Safety Problem

There is no known information about the prevalence of medical error emanating from cultural/organizational problems in health care. Culture is known to contribute to the occurrence of errors and accidents. Its contribution relative to other causal factors is unknown, but likely to

vary, depending on the type of accident and work environment.[3,7,29] The aviation industry attributes its successful safety record in part to analysis of near miss and accident reports (see Chapter 4).[40-43] These types of analyses are only possible if the culture supports reporting of errors. Culture changes may, in fact, have their greatest impact on "underground" (unreported) errors, which are extremely difficult to quantify.

Opportunities for Impact

Although no data from ongoing surveys has yet emerged to permit us to accurately quantify safety culture penetration, we nonetheless speculate based on anecdotal evidence that health care organizations have plenty of room for improvement. A number of observers have noted large-scale obstacles to promotion of safety culture within health care: a pervasive *culture of blame* that impedes acknowledgment of error, and *professional "silos"* that offer unique challenges to changing any universal aspect of health care, including culture.[44-46]

Even before the Institute of Medicine's pivotal *To Err is Human* report was delivered to the public, promoting a safety culture within health care had received widespread attention. The Institute for Healthcare Improvement's Web site features a report "Reducing Medical Errors and Improving Patient Safety: Success Stories from the Front Lines of Medicine."[47] It includes articles about the transformation of culture at the prestigious Dana-Farber Cancer Institute after a highly publicized chemotherapy overdose in 1994, which resulted in the death of a patient. Another article in the same series highlighted the major steps, including cultural change, as noted above, taken by leaders of the nation's largest health care provider—the Veterans Affairs Healthcare System—after fatal medical errors were reported by the media.[47]

Comment

Measuring the impact of culture on safety-related outcomes is challenging. Culture is a complex and abstract construct that must be inferred from behaviors, and analysis often relies on self-reported data.[29] Research continues to develop a working model of safety culture that permits measurement of several connected concepts: individuals' perceptions and attitudes about safety, individuals' observable safety behaviors, and an organization's safety management system as evidenced by its policies and management styles.[35] The relative impact of each of these measures on outcomes is another layer of ongoing research.

Although some data support the effectiveness of the entire VHA initiative in improving safety, there are no direct data supporting the effect of promoting a culture of safety. The use of incentives to reward safety-promoting behavior and publicly demonstrating a commitment to safety are approaches that could be applied in both large and small health care settings. The VHA's reporting system will likely be watched, and potentially adapted by large providers who have inconsistent and/or insufficient reporting of safety problems at local, regional, and national levels.

The evidence presented by Krause provides compelling support for the effectiveness of behavior-based safety programs in a wide range of industrial settings. Although this exact approach has not been evaluated in health care environments, its emphasis on promoting safety culture seems applicable to patient care environments.

As noted in *To Err is Human*, researchers who have studied organizations with a strong safety culture believe that it is "the most critical underlying feature of their accomplishments."[48] Although the nature of the evidence is based on field studies and other methods not typical of medical evidence, it is considered compelling by a number of experts from organizational and other social sciences. At this point, promoting a culture of safety remains surprisingly

unexplored in health care settings, where the risks of error are high. Further research in this area is warranted, though the threshold for evidence may need a different yardstick than is typically applied in medicine (Chapter 2).

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Table 40.1. Checklist of elements that contribute to a patient-safe environment

- ❑ All people acknowledge that top management provides essential patient safety improvement leadership.
- ❑ The organization has clearly defined patient safety polices.
- ❑ All people can explain the organization's patient safety policies.
- ❑ All people are involved in developing patient safety goals, and everyone can explain desired results and measures.
- ❑ All people are actively involved in identifying and resolving patient safety concerns.
- ❑ All people can explain how their personal performance affects patient safety.
- ❑ All people believe they have the necessary authority and resources to meet their responsibilities for patient safety
- ❑ Patient safety performance for all people is measured against goal, clearly displayed, and rewarded.
- ❑ A comprehensive review of patient safety is conducted annually, and there is a process in place that drives continuous improvement.
- ❑ Regular workplace hazard analyses are conducted to identify patient safety improvement opportunities. The results are used to make changes in patient care activities.
- ❑ All people are empowered to correct patient safety hazards as they are identified.
- ❑ A comprehensive system exists for gathering information on patient safety hazards. The system is positive, rewarding, and effective, and people use it.
- ❑ All people are fully aware of patient incident trends, causes, and means of prevention.
- ❑ All injury-producing patient incidents and significant "near misses" are investigated for root cause, with effective preventive actions taken.
- ❑ All people who operate patient care equipment are trained to recognize maintenance needs and perform or request timely maintenance.
- ❑ All people know immediately how to respond to an emergency because of effective planning, training, and drills.
- ❑ Facilities are fully equipped for emergencies; all necessary systems and equipment are in place and regularly tested; and all people know how to use equipment and communicate during emergencies.
- ❑ Ergonomics experts are provided when needed and are involved in patient safety assessment and training.

- ❑ All supervisors/managers assist in patient safety workplace analyses, ensure physical protections, reinforce training, enforce discipline, and can explain how to provide safe patient care.

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