A Safety Culture Primer for the Critical Care Clinician

The Role of Culture in Patient Safety and Quality Improvement

Daniel W. Hudson, BS, Sean M. Berenholtz, MD, MHS, Eric J. Thomas, MD, MPH, and J. Bryan Sexton, PhD, MA

Learning Objectives: After participating in this activity, the intensivist should be better able to:
1. Describe recent evidence that defines, characterizes, and highlights the importance of unit-level safety culture as it relates to patient safety and quality improvement.
2. Describe the tools and methodology associated with assessing and improving safety culture.
3. Explain the importance of linking evidence-based medicine with safety culture change to achieve substantial and sustainable improvements in patient care, and identify proven models that facilitate this process.

The ability to understand, assess, and influence unit-level safety culture is becoming increasingly important in health care. As the body of patient safety and quality improvement literature continues to grow, so does the evidence that unit-level safety culture can be targeted for interventions to improve patient outcomes. Moreover, the Joint Commission recently updated its leadership standards1 to no longer recommend but require routine assessment of safety culture. Leadership standard LD.3.10 requires that “leaders create and maintain a culture of safety and quality throughout the hospital.” The first two elements of performance for this leadership standard are: (1) leaders regularly evaluate the culture of safety and quality using valid and reliable tools; and (2) leaders prioritize and implement changes identified by the evaluation. Thus, with safety culture advancing as an active area of research and an accreditation priority, the time to gain a better appreciation for this important attribute of your ICU, and its role in patient safety and quality improvement, is now.

Background

The Institute of Medicine’s (IOM) seminal report on patient safety, To Err is Human,2 called for a paradigm shift in how medical errors were perceived by the profession and by the public. Through a focus on defects attributable to poor system design as the root cause of medical harm, the area of inquiry moved from individual clinicians to contextual factors. This “system approach”3 recognizes the fallibility of humans and proposes that systems need to be designed with adequate defenses, barriers, and safeguards to anticipate and mitigate inevitable human error and environmental threats to quality and safety. Safety culture, as described in the IOM report and expanded upon here, is a diagnostic and actionable proxy for care quality. The “blame and shame” culture that has long pervaded medicine overemphasizes the role of individual clinicians at the expense of learning from mistakes and making changes to prevent their recurrence. By contrast, a “safe”
Editor-in-Chief
Todd Dorman, MD*
Associate Professor
Departments of Anesthesiology/
Critical Care Medicine, Internal
Medicine, Surgery and Nursing
Johns Hopkins Hospital
Meyer 291
600 N. Wolfe Street
Baltimore, MD 21287-7294
tdorman@jhmi.edu

Editorial Board
Sean M. Berenholtz, MD, MHS
Johns Hopkins University
School of Medicine
Baltimore, MD

Daniel R. Brown, MD, PhD
Mayo Clinic
Rochester, MN

Judith Jacobi, PharmD
Methodist Hospital/Clarian Health
Indianapolis, IN

Z. Leah Harris, MD
Johns Hopkins University
School of Medicine
Baltimore, MD

Pamela A. Lipsett, MD
Johns Hopkins University
School of Medicine
Baltimore, MD

Marek A. Mirski, MD, PhD
Johns Hopkins University
School of Medicine
Baltimore, MD

Dan Mullany, MBBS,
MMedSci(Clin Epi)
The Prince Charles Hospital
Queensland, Australia

Ronald Pauldine, MD
Johns Hopkins Bayview
Medical Center
Baltimore, MD

Jonathan E. Sevransky, MD
Johns Hopkins University
School of Medicine
Baltimore, MD

*Dr. Dorman has disclosed that he is a stock shareholder in Visicu, Inc.

Contemporary Critical Care (ISSN 1543-9003) is published monthly by Lippincott Williams & Wilkins, Inc., 16522 Hunters Green Parkway, Hagerstown, MD 21740-2116. Customer Service Manager, Audrey Dyson: Phone (800) 787-6961 or call (410) 528-8572. 24-Hour Fax (410) 528-4105 or E-mail audrey.dyson@wolterskluwer.com. Visit our website at LWW.com. Publisher, John Ewers.

Copyright 2009 Lippincott Williams & Wilkins. Priority Postage paid at Hagerstown, MD, and at additional mailing offices. POSTMASTER: Send address changes to Contemporary Critical Care, Subscription Dept., Lippincott Williams & Wilkins, P.O. Box 1600, 16522 Hunters Green Parkway, Hagerstown, MD 21740-2116.

PAID SUBSCRIBERS: Current issue and archives are available FREE online at www.lwwnewsletters.com.

COPYING: Contents of Contemporary Critical Care are protected by copyright. Reproduction, photocopying, and storage or transmission by magnetic or electronic means are strictly prohibited. Violation of copyright will result in legal action, including civil and/or criminal penalties. Permission to reproduce in any way must be secured in writing; e-mail: journalpermissions@lww.com. For reprints, e-mail matt.westcoat@wolterskluwer.com.

Opinions expressed do not necessarily reflect the views of the Publisher, Editor, or Editorial Board. A mention of products or services does not constitute endorsement. All comments are for general guidance only; professional counsel should be sought for specific situations.
summarize of the relevant knowledge, tools, and methodologies necessary to understand and assess this important attribute of your ICU. With this foundation established, we present an evidence-based program to improve safety culture, as well as a strategic framework for how best to integrate safety culture change with the implementation of evidence-based practices, to improve patient safety and the quality of care delivered in your ICU.

Culture: Defining an Abstraction

Organizational Culture

Culture is an abstract construct that is often difficult to define. A widely accepted formal definition of organizational culture is: the set of shared attitudes, values, beliefs, and norms that characterizes the functioning or guides the behavior of a group or organization. A more broad view of culture is one that includes the following four components:

1. Shared mental content (attitudes, values, beliefs, and priorities or goals);
2. Norms (language, traditions, behavior patterns, or practices);
3. Institutions (positions, committees, and programs); and
4. Artifacts (characteristic physical structures, equipment, forms, processes, etc.)

A more functional and succinct definition that seems to resonate with critical care clinicians is: “the way we do things around here”—where “here” refers to a specific ICU. In other words, organizational culture in health care represents the context in which care is delivered to the patient.

Safety Culture

Using the broad view, safety culture is the subset of shared mental content, norms, institutions, and artifacts that relate specifically to safety. In a safe culture, employees are guided by an organization-wide commitment to safety, in which each member upholds his or her own safety standards as well as those of their co-workers. This has accreditation implications, as the 2009 Joint Commission Leadership Standards highlight the important qualities of a healthy safety culture:

“In a culture of safety and quality, all individuals are focused on maintaining excellence in performance. They accept safety and quality as personal responsibilities, and work together to minimize any harm that might result from unsafe or poor quality of care, treatment, and services... In this culture, one finds teamwork, open discussions of concerns about safety and quality, and the encouragement of and reward for internal and external reporting of safety and quality issues. The focus of attention is on the performance of systems and processes instead of the individual—although reckless behavior and a blatant disregard for safety are not tolerated. Organizations are committed to ongoing learning and have the flexibility to accommodate changes in technology, science, and the environment. The leaders provide for the effective functioning of the organization with a focus on safety and quality.”

The true power of culture lies in its ability to drive conformity of its members. Strong cultures either coerce compliance or reject aberration. Strong but dysfunctional cultures will reinforce negative attitudes and behaviors. In the ICU setting, safety culture can have a powerful influence on the daily behaviors of front-line clinicians and can either thwart or support patient safety and quality improvement efforts.

Culture vs. Climate

The term “safety climate” is often used in conjunction with safety culture, with little or no differentiation between the two concepts. Thanks in part to a corruption of official terms by funding agencies, executives, and thought leaders, the distinction between safety culture and safety climate in health care is unclear. Social scientists view safety culture as a relatively stable construct or enduring property that can only be assessed through iterative observations and in-depth interviews conducted by anthropologists and ethnographers, who examine the history, norms, institutions, and artifacts of an organization. However, with a need for valid yet feasible methods for conducting annual assessments of safety culture, health care organizations have used survey questionnaires that measure front-line caregiver assessments; therefore, these tools provide only a snapshot of the larger culture through multiple dimensions such as safety climate and teamwork climate. Safety climate is but one domain of the larger safety culture, in that it provides a single-point-in-time assessment of the local safety norms and behaviors. Safety climate is dependent upon prevailing situational and environmental factors, and is therefore responsive to interventions and events in ways that the much more stable safety culture is not.

Because survey questionnaires are not capable of measuring other important aspects of culture such as behavior patterns, a simple rule can be used to determine whether culture or climate applies: if questionnaires are used to obtain group-level assessments, the most appropriate term is climate. Relative to safety culture, safety climate is easier to measure and assess, is more responsive to events and interventions, and is more closely related to patient outcomes. However, because the term “safety culture” is often used where one would expect to see “safety climate,” this distinction is largely academic.

What We Have Learned About Safety Culture in Health Care

With growing interest in the measurement and evaluation of safety culture in health care, several research studies published within the past decade have shed more light on this important attribute of ICU care quality. A brief review of what the evidence has revealed follows.

Safety Culture Is Multidimensional

Exploratory and confirmatory factor analyses, which examine how survey items group together, have shown that safety culture is comprised of multiple distinct dimensions or domains. In a review of available safety culture measurement tools, Singla et al. proposed a list of 23 important factors in patient safety culture assessment. The specific
dimensions of safety culture that are assessed by three of the most widely used and validated survey instruments (Tables 1–3) are discussed in more detail below.

Understanding the multidimensional nature of safety culture becomes important when attempting to assess and improve it. A given ICU can score highly in some dimensions and poorly in others. Thus, multidimensional safety culture assessments are not only more informative; they also provide units with feedback on specific cultural areas in need of improvement that allow for the selection, implementation, and evaluation of focused interventions. Respecting the wisdom of front-line worker assessments of each safety culture dimension allows for quality improvement efforts to be driven by grassroots assessments of need. However, a possible consequence of measuring or implementing interventions that focus on only one dimension (such as teamwork climate) is that it may lead to the neglect of others (such as stress recognition). Therefore, multidimensional safety culture assessment tools such as those presented below are necessary to ensure adequate tracking of unit-level safety culture on a variety of strengths and weaknesses.20,25

Each domain of safety culture is distinct, but also related to the other domains. For example, ICU teamwork climate and safety climate have been shown to covary.24 The Venn diagram shown in Figure 1 illustrates that teamwork climate and safety climate share more variance with each other than with perceptions of management. These climates are distinct but related domains that together generate a safety profile for a given unit that is not unlike a personality profile.

Safety Culture is a Unit-Level Entity

Because safety culture is a group-level attribute, it exists at multiple organizational levels—from the team level to the hospital level. However, research suggests that because hospital units are generally associated with unique managers, policies, locations, patient case mixes, and clinical and operational outcomes, the most appropriate level of analysis for evaluating and improving safety culture is the unit. The six domains measured by the Safety Attitudes Questionnaire (SAQ), which is discussed in more detail below, are more diagnostic (share less variance with each other) when used at the unit level than at the hospital level. Thus, when individual attitudes are aggregated to the unit level, the SAQ provides a snapshot of the safety culture in that hospital unit.24 Moreover, with only rare exceptions, there is more variability among work units within the same hospital than among hospitals.14,20,24 More specifically, ICU safety culture varies significantly across multiple ICUs within the same hospital.21,25 Thus, although hospital-wide assessments of safety culture can be informative, it is more diagnostic and actionable to study the norms and interpret these results at the unit level.20,21 Interventions to improve safety culture as well as clinical and operational outcomes should therefore be targeted to the unit level.13,20 The scalability of safety culture data allows one to survey all hospital units and clinical areas and then aggregate unit-level data to form an overall hospital assessment for comparisons among hospitals.20,21,24,25

Clinician Assessments Vary Significantly by Role

Cross-sectional surveys of operating room (OR), L&D, and ICU personnel have demonstrated disconnects in assessments of teamwork between surgeons and anesthesiologists and between physicians and nurses.26–28 Across these studies, physicians consistently rated the quality of collaboration and communication with nurses highly, whereas nurses rated physicians as mediocre. Figure 2 illustrates the teamwork disconnect between ICU physicians and ICU nurses.

![Figure 1. Venn diagram showing the multidimensional nature of safety culture. Three of the six dimensions of safety culture assessed through the Safety Attitudes Questionnaire are shown. The greater overlap of safety climate and teamwork climate with each other than with perceptions of management indicates that they share more variance.](image1)

![Figure 2. Graph showing discrepant ratings of teamwork between ICU physicians and registered nurses within the same ICU. Data shown are from 62 Michigan ICUs surveyed in 2004, in which there were at least five physicians for comparison with nurses. Physicians rated RNs highly on teamwork, with a mean of 89% (range, 50%–100%). RNs did not reciprocate these ratings for physicians, with a mean of 59% (range, 17%–92%). A paired samples t-test was significant (t = −12.84, P < 0.001).](image2)
Given that breakdowns in teamwork and communication are the root cause of the majority of sentinel events reported to the Joint Commission, the identification and resolution of these disparate perceptions should become a priority in patient safety and quality improvement initiatives.

Safety Culture Is Associated With Outcomes

Safety culture is associated with both clinical and operational outcomes. Using safety climate scores, a study conducted at the Johns Hopkins Hospital demonstrated that improvement in the safety cultures of two different ICUs was associated with sustained improvements in medication errors, length of stay, and nursing turnover rates. Shortly thereafter, a large-scale patient safety collaborative across Michigan ICUs demonstrated an association between teamwork climate scores and the rates of infection associated with central line placement. Figure 3 illustrates the negative association between teamwork climate scores and bloodstream infection (BSI) rates.

Methodology for Assessing Safety Culture

Safety culture assessments provide valuable information that can be used by hospital and unit leaders. In addition to meeting Joint Commission requirements, safety culture assessments, when conducted appropriately, can raise clinician awareness of patient safety and serve as a diagnostic tool that uses grassroots input from front-line workers to guide improvement efforts. They also provide valuable information about potential barriers to implementation of quality improvement projects, such as poor communication, caregiver conflicts, distrust of management, and apprehension about sharing patient concerns. Moreover, assessments can be used to compare units within the same hospital (internal benchmarking) or to identify differences among hospitals, health systems, or even other industries (external benchmarking). Periodic assessments enable trend analysis and identification of progress made over time.

To summarize, safety culture assessments can be used to accomplish any or all of the following different but related objectives: (1) diagnosis of safety culture to identify areas for improvement; (2) evaluation of the effectiveness of patient safety interventions; (3) conduct of internal and external benchmarking; and (4) fulfillment of regulatory requirements. Here we review the methodology for assessing the safety culture in your ICU.

Safety Culture Measurement Instruments

A natural first step in assessing safety culture is to measure it. In response to increased national interest, a growing number of survey instruments (both published and unpublished) have been developed and used during the past decade to measure safety culture in health care settings. Each instrument measures unique dimensions of safety culture and has its own limitations in terms of validity and

<table>
<thead>
<tr>
<th>Table 1. Safety Culture Dimensions and Outcome Variables Measured by the Hospital Survey on Patient Safety Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit-Level Dimensions</td>
</tr>
<tr>
<td>Supervisor/manager expectations and actions promoting safety</td>
</tr>
<tr>
<td>Organizational learning—continuous improvement</td>
</tr>
<tr>
<td>Teamwork within hospital units</td>
</tr>
<tr>
<td>Communication openness</td>
</tr>
<tr>
<td>Feedback and communication about error</td>
</tr>
<tr>
<td>Nonpunitive response to error</td>
</tr>
<tr>
<td>Staffing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2. Patient Safety Climate in Healthcare Organizations Nine-Dimensional Model of Hospital Safety Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Factors</td>
</tr>
<tr>
<td>Senior manager engagement</td>
</tr>
<tr>
<td>Organizational resources</td>
</tr>
<tr>
<td>Overall emphasis on safety</td>
</tr>
</tbody>
</table>

Figure 3. Graph showing teamwork climate and bloodstream infection (BSI) rates across Michigan ICUs. The range of baseline teamwork climate scores across ICUs is grouped into thirds (highs, middles, and lows). Of the high-teamwork-climate ICUs, 44% went at least 5 consecutive months without a single diagnosed BSI. By contrast, only 31% of the middle-teamwork-climate ICUs and 21% of the low-teamwork-climate ICUs achieved the goal of no BSIs for 5 consecutive months.
reliability data. The following section summarizes of three widely used and validated survey instruments.

**Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture (HSOP).** The initial version of HSOP was developed by Westat, a private research organization under contract with AHRQ, through a review of relevant literature, existing published and unpublished safety culture surveys, as well as interviews with hospital staff. Pilot testing in 21 U.S. hospitals was used to refine the instrument and determine its psychometric properties. The final product was a 44-item, hospital-wide survey designed to be completed by all types of hospital staff. The survey emphasizes patient safety and event reporting issues by measuring 10 safety culture dimensions (seven unit-level dimensions and three hospital-level dimensions) and four self-reported outcome measures—all of which demonstrated acceptable reliability during pilot testing. A summary is provided in Table 1.

**Patient Safety Climate in Healthcare Organizations Survey (PSCHO).** PSCHO survey was developed as part of a Stanford University patient safety research program sponsored by AHRQ through the application of high reliability theory (HRT) to safety culture assessment. A review of existing survey instruments used to measure safety culture resulted in the identification of 16 key topics related to maintaining a safe culture in HROs. The initial version of the PSCHO was adapted with permission from existing survey instruments, with additional questions generated to account for all 16 HRO-based topics. Pilot testing in 105 U.S. hospitals was used to refine and finalize the content of the instrument as well as to validate it as a measure that captures the key elements of safety climate as determined by HRT. In its current form, the PSCHO survey is a 38-item, hospital-wide survey designed to be administered to all types of hospital staff. Psychometric analysis of pilot testing data resulted in the identification of nine dimensions reliably measured by the instrument; these were categorized as shown in Table 2.

**Safety Attitudes Questionnaire (SAQ).** SAQ was developed through 10 years of validation and reliability research. Original survey items were derived from attitudinal surveys in aviation, discussions with health care providers and subject matter experts, and conceptual models related to risk analysis and quality and safety assessment. Early pilot testing and exploratory factor analysis resulted in the identification of six attitudinal domains or dimensions (Table 3) containing 30 items from the survey. Additional items determined to be interesting and valuable to unit managers and senior hospital leaders are often included in survey administrations, resulting in a typical length of 30 to 38 items—of which only 30 are used to compute scale scores. The 30 scaled items make up the SAQ-Housewide version, which is available in 15 languages and is the most commonly used version. The SAQ is designed to be completed by all types of hospital staff, but it is unique in that it elicits assessments from front-line caregivers regarding their experiences in a specific clinical area or hospital unit. It consists of a family of surveys—ICU, L&D, OR, and ambulatory versions that contain the 30 scaled items, as well as nonscaled items that are frequently used in collaborative research efforts. Administration of the SAQ in 203 sites throughout three countries demonstrated its good psychometric properties and provided substantial benchmarking data for future comparisons.

The SAQ consists of a series of statements with which respondents agree or disagree using a five-point Likert scale. Overall climate scores showing at least 60% agreement are considered favorable, with a goal of at least 80% agreement. Differences of 10 or more points, over time or among groups, are considered statistically significant.

### Guidelines for Selecting a Survey Instrument

As an ICU clinician, you may be tasked with leading the implementation of an upcoming quality improvement initiative designed to improve outcomes in your ICU. Where should you begin? Research indicates that obtaining a baseline safety culture assessment is a good place to start. However, given the vast array of available survey instruments, how do you select the one that is most appropriate for your needs?

The ability to detect changes in safety culture over time depends on obtaining sequential safety culture measurement data that can be compared meaningfully. It is imperative to select the appropriate instrument carefully up front to enable repeat administrations of the same survey over time. The following criteria may assist with selection:

- **Safety culture domains.** Select a survey instrument that measures the relevant safety culture domains that will be of particular interest for your unit.
- **Versatility and response rates.** A survey instrument should be versatile enough to be used across multiple clinical areas and types of hospital staff. Moreover, the more a specific instrument is targeted to appeal to clinicians within a specific unit, the higher the response rates will be. Response rates are important in that they affect the validity and diagnostic capability of safety culture results. If response rates are less than 60%, the data represent provider opinions rather than a representative consensus about local norms or climates.
- **Psychometric testing.** Before selecting any survey instrument to measure safety culture, it is important to first verify that the instrument is both valid (it measures what it is intended to measure) and reliable (it produces similar results upon repeat measurements). Although all three of the survey instruments presented above have data to support their psychometric validity, each has their own set of

<table>
<thead>
<tr>
<th>Table 3. Safety Culture Dimensions Measured by the Safety Attitudes Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimension</strong></td>
</tr>
<tr>
<td>Safety climate</td>
</tr>
<tr>
<td>Teamwork climate</td>
</tr>
<tr>
<td>Perceptions of management</td>
</tr>
<tr>
<td>Working conditions</td>
</tr>
<tr>
<td>Job satisfaction</td>
</tr>
<tr>
<td>Stress recognition</td>
</tr>
</tbody>
</table>
results need to be sustained and which negative results arching goal of assessment is to understand which positive need to be improved. Effective safety culture assessment is less about selecting a particular instrument and more about using sound methods for collecting, interpreting, feeding back, and in particular, responding to the results. Data feedback, problem solving, and action planning sessions play an important role in using safety culture measurement results to drive cultural change. Because leading these sessions effectively requires specialized skills, tools have been developed to assist health care managers and clinicians with facilitating these processes.

**The Culture Check-Up Tool.** Developed to address the needs of local champions seeking more-frequent and more-productive group discussions about how to improve unit-level safety culture, the Culture Check-Up Tool provides a framework for responding to safety culture measurement results that can enhance safety culture assessments. It is designed for use in one of three ways:

1. To provide a framework to review and discuss safety culture measurement results immediately following a full-scale safety culture assessment;
2. To structure group discussions related to a specific low-scoring item or a recent event for which relevant item results exist; or
3. To longitudinally track and compare actions taken and results achieved within a given unit from one year to the next.

The Culture Check-Up Tool consists of two sections that should take a group approximately 30–60 minutes to complete. In the first section, group members identify a particularly relevant item from the most recent safety culture assessment, usually with a score of less than 60% positive agreement. In the second section, members provide the following information with regard to that item: what the item means to them, how accurately the item score reflects their personal experience on the unit, a description of the behaviors that would be observed if 100% of unit staff strongly agreed with the item, and identification of at least one actionable idea to improve unit results for that item.

Thus, in addition to facilitating structured discussions of clinical area attitudes and behaviors that influence unit-level safety culture, the Culture Check-Up Tool is a low cost, user-friendly culture barometer to gauge progress.

**Targeting Safety Culture for Improvement**

Safety culture assessment data will likely identify several specific domains that are in need of improvement. Deciding which actions to take and how to implement them to achieve maximum success over time can be overwhelming for busy clinicians. Here we present a published intervention that has been associated with improvements in safety culture and clinical outcomes: The Comprehensive Unit-Based Safety Program (CUSP). The CUSP framework provides sufficient structure for an organization to develop a broad strategy to improve safety, while still providing enough flexibility to adapt to the concerns and wisdom of front-line providers.

**An Overview of CUSP**

Based on a review of human factors analysis and systems design literature, discussion with subject matter
experts, and an iterative process of trial and error, CUSP was designed to improve safety climate by empowering staff to assume responsibility for safety in their environment, with the ultimate goal of creating a program that could: (1) be implemented sequentially in work units; (2) improve safety culture; (3) enable staff to focus safety efforts on unit-specific problems; (4) help staff implement system-wide safety initiatives; and (5) include rigorous data collection to support research efforts.13

Originally consisting of eight steps,13 CUSP has evolved into a six-step iterative process, in which each sequential step builds on the previous one to equip front-line providers with the framework, knowledge, and tools necessary to drive change toward safety and quality improvement using evidence-based practices.14 A brief description of each of the six steps of CUSP follows.

1. **Safety culture assessment.** Using the methodology described above, a baseline safety culture assessment identifies both potential unit-specific safety culture domains in need of improvement and barriers to implementing a safety or quality improvement initiative. Safety culture assessments are repeated at 12- to 18-month intervals.

2. **Science of safety educational training.** The science of safety provides a conceptual framework and common vocabulary that equip front-line providers with a systems lens for viewing safety issues: (1) safety is a system property; (2) basic principles of safe system design include standardization, creating independent checks for key processes, and learning from mistakes; (3) these principles apply to technical work as well as teamwork; and (4) teams make wise decisions when there is diverse and independent input.

3. **Staff identification of defects.** With enhanced awareness of system-level defects, front-line providers are then asked to identify known safety issues or defects (defined as anything clinically or operationally that should not recur) by responding to a two-item written survey in which they discuss how the next patient in their unit will be harmed, and what they think can be done to mitigate this safety hazard.

4. **Executive partnership.** Executives are partnered with a work unit to help bridge the gap between senior management and front-line providers by: (1) facilitating communication; (2) improving front-line providers’ perceptions of leadership; (3) improving leaders’ awareness of clinical issues and safety hazards; (4) enhancing staff access to resources needed to mitigate hazards; and (5) holding staff accountable for reducing patient risks.32

5. **Learning from defects.** Front-line providers and senior executive partners are encouraged to learn from at least one defect per month by using a Learning From Defects (LFD) tool that provides both a structured approach to identifying system factors that contribute to defects, as well as a follow-up mechanism to ensure mitigating actions were effective. The LFD tool is structured to assist the individual investigating the defect in answering the following questions: (1) What happened? (2) Why did it happen? (3) How will you reduce the likelihood of this defect happening again? and (4) How will you know risk is reduced?35

6. **Implementation of improvement tools.** Units are provided with a series of practical tools designed to help improve communication, teamwork, and other areas that may present safety hazards. As discussed in more detail below, units select the tools to implement based on their safety culture assessment results.

**Tailoring CUSP to Your ICU**

The power of the CUSP framework stems from its adaptability. The flexibility built into the accomplishment of individual steps enables units to tailor the specific design and execution of CUSP to best suit their safety culture improvement needs. Based on information obtained from the safety culture assessment, units can select from and implement a variety of evidence-based improvement tools that have demonstrated effectiveness in targeting specific safety and teamwork climate areas that are in need of improvement. To address some of the more common safety and teamwork climate issues likely to be encountered in the ICU, we share several “if–then” algorithms (Figures 4 and 5).

Safety climate issues are generally responsive to those components of CUSP that are implemented in steps 2 through 5 listed above. The science of safety training conducted in step 2 will foster the development of a common perspective that will facilitate achieving staff consensus when considering safety issues. Likewise, if the ICU staff feels unengaged in issues related to safety, the identification of and learning from defects using the LFD tool can serve to engage. Finally, for staff members who feel unengaged, unsafe, and unsupported, executive partnership can be a powerful tool for bringing external leadership attention span to bridge trust and safety gaps.

Teamwork climate issues are generally responsive to practical tools designed to improve communication and teamwork that can be implemented in step 6 of CUSP. A brief description of some of these specialized tools, along with the specific teamwork climate issues for which they are particularly well designed to address follows.

**SBAR (Situation, Background, Assessment, Recommendation).**34 If members of the ICU staff have difficulty speaking up when they perceive a problem with patient safety, standardizing communication practices with the use of tools such as SBAR can be an effective strategy—particularly if the difficulty is caused by a difference in communication styles of interdisciplinary providers. SBAR provides a predictable communication structure that has been widely applied to various clinical areas—including ICUs. The SBAR structure ensures critical information needed to answer the following four questions is conveyed in an anticipated manner: (1) Situation—What is going on with the patient? (2) Background—What is the clinical background or context? (3) Assessment—What do I think the problem is? and (4) Recommendation—What would I do to correct it?

**Daily Goals Checklist.**35 For ICUs in which physicians and nurses are not working well together as a coordinated team with common goals, implementation of the Daily Goals Checklist is recommended.
Recommenedation.

by safety culture assessment results. SBA R, Situation, Background, Assessment, Recommendation algorithms forevidence-based solutions to specific teamw ork climate problem s identified.

Figure 4. Flow chart for safety climate improvement illustrating “if–then” algorithms that can be used to identify evidence-based solutions to specific safety climate problems identified by safety culture assessment results.

Figure 5. Flow chart for teamwork climate improvement illustrating “if–then” algorithms for evidence-based solutions to specific teamwork climate problems identified by safety culture assessment results. SBAR, Situation, Background, Assessment, Recommendation.

Designed to improve care team communication regarding a patient’s plan of care by explicitly defining goals for “the patient in this bed today,” this checklist can be adapted to the needs and culture of a specific ICU. It requires providers to state the tasks to be completed, the care plan, and communication of the plan necessary to get the patient to a less acute level of care.

Morning Briefing Tool. For ICUs in which staffing levels are inadequate or in which important information is regularly lost at change of shift, implementation of the Morning Briefing Tool is recommended. Originally designed for use in ICU settings, this tool consists of three sections that answer the following questions during the briefing: (1) What happened overnight that I need to know about? (2) Where should I begin my rounds? and (3) Do you anticipate any defects in the day?

Shadowing Another Provider (SAP) Tool. Finally, for those ICUs in which conflicts are not appropriately resolved, or in which there is confusion or disagreement surrounding interdisciplinary provider roles and responsibilities, the SAP tool is recommended. Developed as a simple tool to help providers identify teamwork, communication, and collaboration issues that affect patient care from the perspective of other groups, the SAP tool provides an opportunity for the person shadowing another provider to view patient care from another’s perspective and to make recommendations to improve multidisciplinary interactions. The tool consists of four sections in which the observer provides the following information: (1) description of interactions that occurred; (2) identified communication and teamwork issues that affect teamwork climate and patient care; (3) description of what the observer will do differently in clinical practice to communicate more effectively; and (4) recommendations for improving communication and teamwork.

Using Safety Culture Change to Improve Patient Outcomes

Although striving to assess and improve the safety culture within the ICU is a laudable goal in and of itself, executives, clinicians, and patients are usually far more interested in improving clinical and operational outcomes. The final section of this article is dedicated to highlighting the important role safety culture plays in achieving consistent and sustainable improvement in outcomes through patient safety and quality improvement initiatives by providing a supportive organizational context.

Translating Evidence Into Practice

Simultaneous advances in two components are necessary to improve the quality and safety of patient care: evidence-based medicine (EBM) and evidence-based management (EBMgt). EBM is related to the “content” of providing care and identifies clinical practices that lead to improved care, whereas EBMgt identifies organizational strategies, structures, and change management practices—the “context” of providing care—that facilitate clinician implementation of EBM. Recall that our functional definition of organizational culture—“the way we do things around here”—refers to the local context in which care is delivered to the patient. Thus, improvement in the quality and safety of patient care depends upon both the identification of best clinical practices and the implementation of these practices within a supportive culture. Moreover, evidence suggests that better performance is achieved when providers openly share their mistakes, ask for help when needed, and continually question what is being done and how to do it better—all important aspects of a safe culture.

Put another way, for health care organizations to realize sustained improvements in patient safety and health care quality, they must address both technical problems (problems for which scientific evidence exists) and adaptive problems (problems that require changes in attitudes, values, or beliefs—culture change). In large-scale collaborative research projects, a centralized research team typically accomplishes the technical work, whereas the local team accomplishes the adaptive work. In the Keystone ICU Project, a quality improvement initiative that resulted in a significant reduction in CRBSIs, which was sustainable even 4 years later, adaptive and technical work were integrated by coupling CUSP with a strategy for translating evidence into practice. In brief, this strategy evolved into the following four-stage model designed to engage collaborative multidisciplinary teams both centrally (stages 1–3) and locally (stage 4):
2. Identify local barriers to implementation.
3. Measure performance using valid and feasible measures.
4. Ensure all patients reliably receive the interventions.

As stages 1–3 are primarily the responsibility of a central research team in large-scale efforts, we focus on the more complex task associated with stage 4, which the local team or ICU would be largely responsible for accomplishing.

The “Four-E’s” Model. Based on evidence and experience, an approach that targets senior leaders, ICU directors, and staff was developed to improve the reliability of evidence-based interventions. Although similar in several ways, the four E’s model differs from another cyclic quality improvement method—the PDSA (plan-do-study-act) model—in that it recognizes the importance of culture change, and contextual factors, in engaging staff and sustaining improvement. A summary of the four E’s model follows:

1. **Engage.** How does this make the world a better place? Explain why the interventions are important by sharing real-life stories of patient tragedies and by estimating the harm attributable to omitting the intervention, given a specific unit’s baseline data. Keep providers engaged by communicating results of evaluations discussed below.
2. **Educate.** What do I need to know? Share the evidence from scientific literature supporting the interventions.
3. **Execute.** What do I need to do? Design an intervention toolkit that addresses barriers to implementation and that provides a framework for redesigning care processes using the following principles of safe design: standardization of care processes, creating independent checks (such as checklists) that provide redundancy, and learning from mistakes.
4. **Evaluate.** How will I know I made a difference? Regularly compare baseline data against performance measures collected during and after implementation of the intervention. It is also important to evaluate periodically for unintended consequences of the intervention, which may result from either decreased attention to other care processes or from new harm introduced as a result of system changes associated with the intervention. The future of sound quality improvement will not depend upon the simple before-and-after study designs used by most quality improvement efforts; as this science matures, ongoing efforts to evaluate improvement will need to incorporate new and evolving methods.

The strength of this model in achieving substantial and sustainable improvements in patient outcomes, as demonstrated by the reduction in CRBIs in the Keystone ICU Project, has been attributed to several factors. First, it combines scientific evidence that providers trust with the necessary safety culture change (achieved through implementation of CUSP) to ensure adherence with evidence-based practices. Next, providers are engaged in the process by sharing tragic stories, demonstrating how baseline performance can help or harm the next patient, and providing regular performance-based feedback that enables them to see the results of their work. Finally, whereas the resource-intensive technical work required to summarize the evidence, define performance measures, and standardize processes across hospitals is accomplished by a central research group, the adaptive work required to implement the interventions and measures is performed by local teams who are most familiar with their own resources and culture.

**Strategy for Improving Patient Care in Your ICU**

Although the model presented above was designed for use in large-scale quality improvement research collaboratives, its framework can be used to improve performance within any patient safety or quality improvement project. Key steps for initiating, improving, evaluating, and sustaining quality improvement programs in ICUs were published in a “how-to” guide for interdisciplinary teams. Although this structure provides a useful framework, in our view it does not adequately emphasize the importance of culture, nor does it provide specific strategies for driving change. With the foundation for linking evidence-based practices with safety culture change established above, the following high-level strategy is provided to facilitate current and future endeavors to improve patient care in the ICU:

1. **Select an outcome of interest.** Identify a specific clinical or operational outcome for which evidence-based practices or strategies to improve exist.
2. **Implement CUSP.** Ensure the safety culture in the ICU is one that will best support your improvement efforts by using safety culture assessment results to select, adapt, and implement those CUSP safety and teamwork tools that are designed to change clinician behavior in a manner that best addresses your needs (Figures 4 and 5).
3. **Implement an evidence-based outcome intervention.** Using the four-stage approach for translating evidence into practice (with particular emphasis on the four-E’s model), adapt and implement the evidence-based practices in a manner that suits your ICU’s unique culture and resources.
4. **Assess impact.** As indicated in both CUSP and the translating evidence into practice model, periodically assess the impact of the interventions on both the ICU’s safety culture and on the outcome of interest. A previously published framework for an ICU safety scorecard to monitor and measure progress in improving patient safety and quality can serve as a useful starting point. Based on an adaptation of Donabedian’s model for evaluating the quality of medical care, which illustrates that how care is organized (structure), how care is delivered (process), and the context in which care is delivered (culture) all influence the health care outcomes that are achieved (patient outcomes)—the ICU safety scorecard consists of the following four domains:
   - **Outcome measure:** How often do we harm patients?
   - **Process measure:** How often do we use EBM?
   - **Structural measure:** How do we know we learned from mistakes?
   - **Context measure:** How well have we created or maintained a culture of safety?
5. **Provide feedback.** To keep providers engaged and motivated to participate in this and future improvement projects, provide regular feedback on their performance and on the impact of their efforts.
Conclusion

During the past decade, an expanding evidence base in health care has demonstrated that safety culture plays an important role in the safety and quality of patient care. Research has demonstrated that unit-level safety culture is associated with clinician behavior as well as clinical and operational outcomes. Safety culture is multidimensional, and a growing body of evidence highlights the particular importance of teamwork climate and safety climate. Safety culture is measureable using several valid instruments, responsive to interventions, and linked to a growing number of patient outcomes. Selecting the right measurement instrument is important, but once the selection is made, appropriate use of methods for collecting, aggregating, interpreting, feeding back, and responding to the results is critically important.

ICU clinicians have a larger body of relevant evidence than many of their colleagues, in that a great deal of seminal work has already been conducted and replicated in the critical care setting. In particular, CUSP provides a strategic framework designed to improve safety culture by respecting and using the local wisdom of clinicians that directly interact with patients at the front line. Using safety culture assessment to identify unit strengths and weaknesses, CUSP activities can be adapted to unit-specific objectives to maximize improvements in safety culture. By using CUSP to integrate safety culture change with evidence-based interventions designed to improve specific patient outcomes, greater and more sustainable results can be achieved.

Significant and sustainable improvements in patient safety and quality of care cannot occur in the absence of a supportive context. Unit-level safety culture and the safety and quality of patient care are therefore inextricably linked.

REFERENCES

5. Pronovost PJ, Berenholtz SM, Goeschel CA, et al. Creating high reliability in healthcare has demonstrated that safety culture plays an important role in the safety and quality of patient care. Research has demonstrated that unit-level safety culture is associated with clinician behavior as well as clinical and operational outcomes. Safety culture is multidimensional, and a growing body of evidence highlights the particular importance of teamwork climate and safety climate. Safety culture is measureable using several valid instruments, responsive to interventions, and linked to a growing number of patient outcomes. Selecting the right measurement instrument is important, but once the selection is made, appropriate use of methods for collecting, aggregating, interpreting, feeding back, and responding to the results is critically important.

ICU clinicians have a larger body of relevant evidence than many of their colleagues, in that a great deal of seminal work has already been conducted and replicated in the critical care setting. In particular, CUSP provides a strategic framework designed to improve safety culture by respecting and using the local wisdom of clinicians that directly interact with patients at the front line. Using safety culture assessment to identify unit strengths and weaknesses, CUSP activities can be adapted to unit-specific objectives to maximize improvements in safety culture. By using CUSP to integrate safety culture change with evidence-based interventions designed to improve specific patient outcomes, greater and more sustainable results can be achieved.

Significant and sustainable improvements in patient safety and quality of care cannot occur in the absence of a supportive context. Unit-level safety culture and the safety and quality of patient care are therefore inextricably linked.

REFERENCES

5. Pronovost PJ, Berenholtz SM, Goeschel CA, et al. Creating high reliability in healthcare has demonstrated that safety culture plays an important role in the safety and quality of patient care. Research has demonstrated that unit-level safety culture is associated with clinician behavior as well as clinical and operational outcomes. Safety culture is multidimensional, and a growing body of evidence highlights the particular importance of teamwork climate and safety climate. Safety culture is measureable using several valid instruments, responsive to interventions, and linked to a growing number of patient outcomes. Selecting the right measurement instrument is important, but once the selection is made, appropriate use of methods for collecting, aggregating, interpreting, feeding back, and responding to the results is critically important.

ICU clinicians have a larger body of relevant evidence than many of their colleagues, in that a great deal of seminal work has already been conducted and replicated in the critical care setting. In particular, CUSP provides a strategic framework designed to improve safety culture by respecting and using the local wisdom of clinicians that directly interact with patients at the front line. Using safety culture assessment to identify unit strengths and weaknesses, CUSP activities can be adapted to unit-specific objectives to maximize improvements in safety culture. By using CUSP to integrate safety culture change with evidence-based interventions designed to improve specific patient outcomes, greater and more sustainable results can be achieved.

Significant and sustainable improvements in patient safety and quality of care cannot occur in the absence of a supportive context. Unit-level safety culture and the safety and quality of patient care are therefore inextricably linked.
CME QUIZ: Volume 7, Number 5

To earn CME credit, you must read the CME article and complete the quiz on the enclosed answer form, answering at least seven of the 10 quiz questions correctly. Select the best answer and use a blue or black pen to completely fill in the corresponding box on the enclosed answer form. Please indicate any name and address changes directly on the answer form. If your name and address do not appear on the answer form, please print that information in the blank space at the top left of the page. Make a photocopy of the completed answer form for your own files and mail the original answer form in the enclosed postage-paid business reply envelope. Your answer form must be received by Lippincott CME Institute, Inc., by September 30, 2010. Only two entries will be considered for credit. For more information, call (800) 787-8981.

Online quiz instructions: To take the quiz online, go to http://cmelwwnewsletters.com, and enter your username and password. Your username will be the letters LWW (case sensitive) followed by the 12-digit account number on your mailing label. You may also find your account number on the paper answer form mailed with your issue. Your password will be 1234; this password may not be changed. Follow the instructions on the site. You may print your official certificate immediately. Please note: Lippincott CME Institute, Inc., will not mail certificates to online participants. Online quizzes expire at 11:59 pm Pacific Standard Time on the due date.

1. Organizational culture is an abstract construct that is often difficult to define. A broad view of culture is one that includes
   A. shared attitudes, values, and beliefs
   B. behavior pattern norms
   C. characteristic physical structures and processes
   D. all of the above
2. The terms “safety culture” and “safety climate” are often confused. All of the following statements reflect distinguishing characteristics of safety climate, except
   A. It is highly dependent upon prevailing situational and environmental factors.
   B. It refers to a perceived state of safety at a particular place and time.
   C. It can only be assessed through iterative observations and in-depth interviews.
   D. It is responsive to events and interventions.
3. All of the following statements reflect important lessons learned from recent evidence about safety culture in health care, except
   A. Safety culture is a unit-level entity.
   B. Different provider types within the same ICU can have disparate perceptions of safety culture.
   C. Safety culture is a one-dimensional component of organizational culture.
   D. Safety culture is associated with clinical and operational outcomes.
4. Which of the following objectives can be accomplished by assessment of safety culture?
   A. Identification of problematic attitudes or behaviors that adversely affect patient care
   B. Evaluation of patient safety intervention effectiveness
   C. Internal and external benchmarking
   D. Fulfillment of regulatory requirements
   E. All of the above
5. You have been tasked with assessing the safety culture in the ICU. All of the following are important criteria for selecting the appropriate instrument, except
   A. safety culture domains evaluated by the instrument
   B. availability of psychometric testing data that illustrate validity and reliability
   C. availability of evidence that supports an association between assessment data and clinical and operational outcomes
   D. none of the above
6. To ensure survey data represent a consensus measure of climate rather than unstable provider opinions, the minimum survey response rate should be
   A. 20%
   B. 40%
   C. 60%
   D. 80%
7. The methods used to implement a safety culture assessment can be more important than the specific survey instrument used. Which of the following practices is/are designed to enhance staff engagement and participation in the survey process?
   A. Clear communication of survey purpose
   B. Use of protected time for survey administration
   C. Use of paper surveys instead of Web-based surveys
   D. All of the above
8. Which one of the following practices is not an essential component of the Comprehensive Unit-Based Safety Program (CUSP)?
   A. Safety culture assessment
   B. Identification of and learning from defects
   C. Implementation of a mandatory reporting system for defects
   D. Partnership between senior executives and hospital units
9. In the CUSP model, local units or teams are typically responsible for
   A. summarizing the evidence for interventions to improve a specific outcome
   B. identifying local barriers to implementation
   C. measuring performance using valid and feasible measures
   D. ensuring all patients reliably receive the interventions
10. An ICU safety scorecard consists of four domains to assess intervention impact: structural measures, process measures, contextual measures, and outcome measures. Which one of the following questions best evaluates contextual measures?
    A. How well have we created a culture of safety?
    B. How do we know we learned from mistakes?
    C. How often do we use evidence-based medicine?
    D. How often do we harm patients?