

Culture of Safety: Beyond the Safety Survey  
A Cross-sectional, Mixed Methods Study

By

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B.S.N. (California State University, Sacramento) 2010

THESIS

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF SCIENCE

in

Nursing Science and Healthcare Leadership

in the

OFFICE OF GRADUATE STUDIES

of the

UNIVERSITY OF CALIFORNIA

DAVIS

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2012

Culture of Safety: Beyond the Safety Survey --

Implications for Nursing Science and Healthcare Leadership

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June 2012

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Abstract

Assessing the safety climate of healthcare organizations is an important step in embarking on creating processes to improve overall patient safety. Nursing leadership considerations for improving safe practice must begin with a measurement of the current *perception* of safe practice in order to correct unsafe practice. If the present culture is not responding to interventions to improve unsafe practice, there is no point in measuring safety culture (Pronovost P., Sexton, B. 2006). The Agency for Health Research and Quality's (AHRQ), Culture of Safety Survey (COSS) poses questions in key areas affecting patient safety from frontline staff's lived experience and perceived sense of safety. In this study, we observed through a focus group that inviting feedback from healthcare staff (that had responded to the PICU COSS) created engagement of staff to contribute to safety improvement measures on their unit. Staffing, consistent communication, and supply access were themes identified for improvement.

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## Implications for Nursing Science and Healthcare Leadership

Assessing the safety climate of healthcare organizations is an important step in embarking on creating processes to improve overall patient safety. Nursing leadership considerations for improving safe practice must begin with a measurement of the current *perception* of safe practice in order to correct unsafe practice. If the present culture is not responding to interventions to improve safety, there is no point in measuring safety culture (Pronovost P., Sexton, B. 2006).

We examined three years' of data from the Agency for Healthcare Research and Quality (AHRQ) Culture of Safety Survey (COSS) as completed by the staff of a 16-bed Pediatric Intensive Care Unit (PICU) in an academic health center. The AHRQ COSS poses questions in key areas affecting patient safety from frontline staff's lived experience and perceived sense of safety. In addition, we carried out a focus group with nursing staff and interviews with unit leaders to add qualitative data. In our study, we observed that inviting feedback from healthcare staff (that had responded to the PICU COSS) created engagement of staff to contribute to safety improvement measures on their unit. The research from this study found that firsthand insight into including staff's voice in the safety process improvement endeavor is fundamental to transforming existing cultural beliefs and attitudes.

Factors that contribute to unsafe conditions and promote commission of errors may lie dormant within a healthcare culture and not surface until a system flaw is identified. These factors are referred to as "latent conditions" (Reiling, Hughes, Murphy

2008). When PICU leadership became aware of the staff's low perception of safety in the 2009 and 2010 COSS survey results, it was proposed that some "latent conditions" may exist in the PICU. Unit leaders approached this possibility and began making changes to improve what they already knew from previous staff reports. Staff report and the researcher's informal observations include the following latent conditions: 1. Communication, 2. Supply Access, and 3. Hand Sanitizing. This paper will address a series of implications from our work: for Practice Management (with special emphasis on the importance of feedback), Research, Leadership, Education, and Policy.

### Practice Management Implications

The three identified latent conditions were addressed in the following ways.

#### **Communication**

Improvements in communication among staff and between staff and management were also implemented as a result of COSS feedback. Concern had been expressed from nursing staff that moving to a larger, single unit would jeopardize efficient communication. Management purchased Vocera, a voice-activated, two-way communication device. PICU leaders also created a unit web page to post important news and information as appropriate. The PICU staff may contribute to the content of the web page as they encounter relevant information to share.

Leaders and frontline staff expressed a lack of feedback regarding reported adverse events. A recommendation from this study was to include adverse event situations and learnings from the errors as a standard section on the website as a means for consistent feedback on reported errors. It was also suggested to leaders that this tactic

may encourage staff to readily report adverse events. These changes in communication reportedly have improved communication and the perception of communication.

The idea of an “Oops Board” was also suggested. This bulletin board may be posted in the staff lounge where staff can document near miss catches and acknowledgements to each other for recognizing a safety hazard.

### **Supply Access**

A new PICU began construction in 2009, and was moved into in 2011. Design of the new PICU unit took into account practice performance obstacles mentioned on the COSS and witnessed from observations. Nursing staff felt that supplies were not readily available; patient rooms and supply rooms were not well stocked. From this feedback, supply carts were purchased for each patient room and stocked with the critical supplies for immediate patient care. Supply rooms were clearly marked and par levels were increased for the most frequent stock-out items. Staff report having supplies accessible in the patient rooms has improved nursing practice and safe care for their patients

### **Hand Sanitizing**

Observation in the existing unit revealed the absence of hand sanitizing foam outside of each patient room. This omission was corrected prior to the new unit opening and was carried over to the new unit. Having the foam canisters more readily available should prove to increase the practice of more frequent handwashing.

### **Feedback implications**

The measurement of the culture through COSS should include presenting the results to the staff and senior management. The presentation of results should be followed by focused interventions to improve safety culture (Pronovost, 2006). At the time of this study, interventions were being implemented before results had been shared with staff.

A model for implementing safety culture comes from the Comprehensive Unit-based Safety Program (CUSP) study conducted at Michigan Health and Hospital Association's, Keystone Intensive Care Unit (ICU) Project (Sexton, Berenholtz, Goeschel, Watson, Holzmueller et al, 2011). The CUSP model maps out steps for leaders to effectively assess, improve and evaluate the safety culture on their unit. The main objective of CUSP is that leaders will pair with frontline teams so the leader can begin to champion for change to resolve the risks identified. The model employs methodic steps to employ a constant feedback loop for sharing and reevaluating results. This type of leader engagement has shown to improve the climate of safety (Frankel, Grillo, Pittman, Thomas, Horowitz, et al, 2008).

### **Research Implications**

Assessing the safety of a work environment culture is not a new concept. Interest is growing in the importance of including the frontline healthcare staff's voice in making process changes to improve safety. Nurse leaders in the PICU demonstrated a sincere interest in the feedback obtained from PICU staff in the focus group discussion carried out in this study. The marked improvement in the COSS results from 2010 to 2011 helped the leadership realize the importance of including staff in decisions for care and

process improvements on the unit. Staff expressed an increase in ownership from seeing that their concerns were addressed and resolved.

The introduction of a focus group into the PICU survey process provided staff an opportunity to define specific detail behind survey responses as well as an opportunity to express what is going well. PICU leadership found this kind of discussion to be of value in maintaining the attitude of pride and ownership in the new unit and in continuing to improve safe patient care processes. The 2011 Keystone ICU study reports the failure to evaluate how particular ICU caregivers were fundamentally involved with leaders in CUSP suggesting that there may have been variation into how interventions were implemented (Sexton, 2011). The value of beginning a patient safety project debriefing with staff in a focus group setting provides all inclusive focus as leaders take action to improve patient safety and fosters positive cultural safety attitudes among frontline staff.

Research into safety climate allows leaders the opportunity to benchmark their culture against the safety culture of other units in their organization and other organizations (Sexton, Helmreich, Neilands, Rowan, Vella, 2006). This gives leaders the opportunity to assess strengths and weaknesses of their team and organizations.

Future research is necessary to compare the effectiveness of different methods of employing feedback loops. This study demonstrated the importance of constant communication between staff and management. Creating an atmosphere where staff realize they are not only heard but experience action taken is a critical link to creating positive perceptions of a safe work environment. The order in which action steps are

taken is a key component. Frontline staff must be involved from the beginning of any quality improvement change.

Creation of staff project teams, staff project champions, the CUSP model and staff partnership councils are recent models aimed at perpetuating the feedback loops that warrant future study and evaluation.

### Leadership Implications

Safety survey results help leaders detect safety concerns in their area. Many organizations hold leaders accountable or connect bonus compensation based on survey results and survey participation (Pronovost, 2006). But leaders cannot rely on survey results alone to formulate action plans or determine the safety climate of their organization. The Agency for Healthcare Research and Quality's (AHRQ) website on Hospital Survey's on Patient Safety, contains many tools and resources to assist leaders with interpretation of results and design action plans (Agency for Healthcare Research and Quality, 2011). Leadership in the PICU utilized many of the AHRQ tools in preparation for result dissemination and action planning. One of the tools utilized was the Safety Culture Dimensions and Reliability Tool. This tool provides leaders with an understanding of which survey questions are related to their Overall Safety Grade and which questions relate to the overall sense of open communication in their organization. Leaders gain an unbiased understanding of their results and are also taught to make possible correlations between some of the survey dimensions prior to creating interventions. The value and use of the AHRQ website should be a standard portion of the rollout following COSS.

## Educational Implications

Staff should be educated to the concept of safety being the property of all staff and not solely that of healthcare institution's leaders (Colla, 2006). Providing a focus group venue for frontline staff to express their concerns instilled a sense of organizational interest in understanding what staff had to offer to improve safety. Focus groups also provided leaders with a more personal and descriptive perspective into the safety issues perceived by staff.

Deficiencies in current medical training is a source of preventable harm to patients . Current education and training does not reliably prepare clinicians for proficiency in performing procedures for patients (Rodriguez-Paz, Kennedy, Salas, Sexton, Hunt, et al, 2009). An educational approach for improving patient care and procedure training prior to live performance involves creating a mocked-up simulation experience. Prior to moving to the new PICU, a mocked-up patient room was set up in the new PICU. Staff were allowed to familiarize themselves with where things are in the room as well as to simulate day-to-day procedures and activities. This kind of preparation not only familiarized staff with their new surroundings, but also contributed to a decrease in the interruption of patient care because staff had already used supplies and equipment and felt comfortable before beginning actual patient care. This educational model includes important components that provide performance measurement and feedback before actual patient care ensues (Rodriguez-Paz, 2009).

An important aspect of the education piece will be incorporating culture of safety training to nursing students before they are employed and working with patients. To

understand the concepts of the importance of speaking up and identifying risk before it becomes an adverse event is critical in shifting the current cultural attitudes about work environment and patient safety. For example, this researcher has presented a Culture of Safety Concepts lecture to RN-BSN students at a local state university. It has been well received by the faculty and added to their annual curriculum.

### Policy Implications

Maintaining the PICU's attitude about the importance of a safe work environment will require a permanent commitment from nursing leadership at the unit and hospital level, as well as from the nursing staff. The Joint Commission offers guidance in this area through a Speak Up Initiatives web site (The Joint Commission, 2012). The site offers many aides for leaders to incorporate into any type of healthcare setting. Materials including posters and brochures are offered to advertise the expectation that it is every staff member's responsibility to speak up when errors or opportunities to improve are identified. The site includes a universal protocol template so healthcare organizations may draft protocols and policies that make speaking up for safety a job related expectation.

Leaders in the PICU were made aware of the information on this site and encouraged to adopt such a policy to ensure communication regarding safe patient care and work environment practice is taken seriously. Once implemented, PICU leaders could then educate staff on the policy to raise awareness and set expectations. Introducing the policy and setting expectations projects leadership's commitment to the important work begun to promote safe work practice.

## Limitations

A limitation in this study is that the COSS was distributed exclusively to the PICU staff and the disciplines assigned to the PICU. It has been recommended to PICU leadership that COSS be distributed throughout their organization. Culture tends to be local and there will be variability in the perception of safety culture nursing unit to nursing unit (Pronovost, 2006). Failure to generalize the safety survey encourages a silo-culture effect rather than building a healthy organizational culture of safety. Other nursing units will be interested in their own cultural assessment after learning about the improvements in the PICU (Pronovost, 2006).

## Conclusion

The use of a comprehensive safety survey is an effective and reliable tool for healthcare leaders to begin assessment of the level of safety perceived by staff. The survey, however, is only the beginning and should not be used as the means to implement process changes to enhance safety. Survey results should be used as an outline to identify areas for improvement. The interpretation of the results begin with presenting the results to the frontline staff and having focused discussions about what was behind their survey responses. Focus group discussions have a two-fold benefit: 1) It allows for leaders to gain firsthand insight into how staff perceive their work environment. 2) Staff realize the concern and desire of leadership to create practice and process that best customizes an environment of safety to frontline staff's needs.

The positive change in the PICU COSS over time demonstrates that healthcare leadership would benefit from including follow-up steps to safety climate responses that

include debriefing with staff before designing possible changes. Including what staff has to say about the reasons for answering survey questions the way they did is a process that can lead to potential practice change for which both leadership and frontline staff hold each other accountable. Knowledge of the recent research into *Rounding for Outcomes* (Hotko, B., n.d.), and implementing *Speak Up Initiatives* (The Joint Commission, 2012) to encourage continuing open communication about safe and unsafe work environment events, are cornerstones to realizing a transformation in perception of safe work environment and ultimately, quality patient outcomes.

The administration of the healthcare organization that serves the PICU should consider deploying a culture of safety survey to the entire organization. A unified, joint effort to improve safety throughout the organization would demonstrate a positive effort of support to improve the work environment safety for all employees.

#### Division of thesis work in the article intended for publication

Co-authors contributed equally to the work produced in this thesis project. Therese Frank jointly wrote the abstract with Kim Whitney. Frank wrote the Introduction and Methods section. The Results section was a joint effort of Frank and Whitney. Whitney wrote the Background, Discussion and Conclusion sections. Both authors shared in the thesis revision process.

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## Culture of Safety: Beyond the Safety Survey

### Introduction

Unsafe patient care practices tarnish the U.S. healthcare delivery system. The Institute of Medicine (IOM) report, *To Err is Human: Building a Safer Health System*, revealed that the frequency of serious errors occurring in acute care settings is devastatingly high (Committee on Quality of Healthcare in America, 1999). These errors, ranging from adverse drug events to mistaken patient identities, not only cost healthcare organizations billions of dollars but led to the loss of 98,000 lives in 1998 alone (Institute of Medicine, 1999). It is as harmful for the receiver of healthcare errors as it is for the provider. Healthcare errors can lead to career loss, social stigma and psychological and emotional distress. Additionally, these errors cause staff to become frustrated at their inability to provide high quality and safe care to patients. Nine years following the release of the groundbreaking IOM report, the Society of Actuaries identified 6.3 million medical injuries in the U.S. Of these errors, 1.5 million were due to medical error. These errors cost the U.S. economy an estimated \$19.5 billion (Milliman, Inc., 2010).

These alarming statistics are supported through the results from the Agency for Healthcare and Research Quality (AHRQ)'s Culture of Safety Survey (COSS). The overall results for 2011 show that 39% of healthcare staff across the nation perceives their workplace safety environment has room for improvement (Agency for Healthcare Research and Quality, 2011).

The purpose of this study was to examine healthcare staff's view of patient safety issues through a review of three years of patient safety survey results in a Pediatric

Intensive Care Unit (PICU). The study included voluntary PICU staff participant discussions about survey responses conducted in a focus group. Obtaining an understanding of staff's work experiences that lie behind the survey responses helped identify specific areas of focus to guide improvements in patient safety.

## Background

### **Patient Safety**

The 1999 report *To Err is Human: Building a Safer Health System* called on the healthcare industry to develop improvements that would promote safe patient care. The report contended that unsafe practice is not typically due to individual error, but more often is caused by inadequate organizational systems that do not design jobs and working conditions for safety, and do not standardize and simplify equipment, supplies, and processes. Systems have the ability to prevent staff from making mistakes, but they may also enable them to commit errors (Committee on Quality of Healthcare in America, 1999). What matters are how the systems are deployed and how actual social actors interpret them, uphold rules, and behave within the constraints of systems given their roles and positions within a context of norms and mores.

Since the publication of the IOM report, there has been more than a decade of work on patient safety. Such efforts include the Joint Commission's release of the first set of National Patient Safety Goals (NPSG) in 2003. The NPSG were developed to assist accredited healthcare organizations in improving safety in each of the 15 published areas. All elements in each goal must be met to maintain accreditation (The Joint Commission, 2010). Another example of ongoing work is the Medication Error Reduction Plan

(MERP), a program mandated by the Institute of Safe Medication Practices (ISMP). In order to maintain licensure, every general hospital in California must develop a plan to reduce medication errors, which includes implementing technology to assist with the reduction plan. ISMP set specific criteria to be addressed in each plan; these plans must be approved by the California Department of Public Health (Institute of Safe Medication Practices, 2010). An error reduction initiative that is directly related to this study, for example, involves improvement around handoff for intravenous drip rates. Despite the assistance of these and many other programs, errors related to unsafe practices still occur; producing dangerous outcomes using this same example, nurses may still connect intravenous and feeding tubing to the wrong delivery system (Drummond, 2011). Nurses lose their jobs and have even taken their own lives as a result of being the “second victim” of medical errors due to the guilt, shame, and blame of committing errors (Aleccia, 2011). In short, there is still much room for improvement in safe patient care. Nurses are in a unique position to drive safe patient care practices within health care. Through their empowerment to lead, their efforts to improve patient safety will be a critical element to realize safer patient care.

### **The Survey**

Patient safety is defined as a discipline of applying science to improve safety; the goal is to provide a system of health care delivery that can be trusted. Working toward this goal, the Agency for Healthcare and Research Quality (AHRQ), one of twelve federal departments in Health and Human Services, took direction from the IOM report and committed to assist healthcare institutions address safe patient care practices. It is AHRQ’s contention that in order to achieve better safety outcomes, healthcare staff must

trust that how they deliver patient care and how they are supported by their organization contributes to safe practices. These beliefs constitute the culture of patient safety.

With ARHQ sponsorship, the Culture of Safety survey (COSS) was developed. The validity and reliability of the survey tool have been well established through the AHRQ. The Safety Culture Dimensions and Reliabilities tool was adapted from research published in 2000 that tested the effects of group climate in manufacturing jobs; the tool uses Cronbach's alpha of reliability for each of the COSS dimensions.

Since the release of the survey in 2004, the number of hospitals across the United States that have issued the survey to healthcare staff has almost tripled (Agency for Healthcare Research and Quality, 2011). In 2007, AHRQ began to trend the survey response data from all participating hospitals and made the comparative data publicly available. While some hospitals show improvements in scores, other hospitals' scores dropped by as much as four percentage points in some survey dimensions (Agency for Healthcare Research and Quality, 2011). When AHRQ interviewed leadership from these hospitals as to the possible reasons for decreases in the perception of safety, the following factors were found: 1) there was palpable tension between frontline staff and management, resulting in staff turnover; 2) union negotiations were causing divisions among frontline staff; and 3) leaders were unsure of what information should and should not be shared with those conducting the survey (Agency for Healthcare Research and Quality, 2011). In each of these explanations for lower scores, communication issues were at the forefront.

Hospitals that were able to move some of their dimension scores in a positive direction, however, were still not experiencing an improvement in the overall Safety Grade. Furthermore, between 2010 and 2011 there was no movement in scores from staff who rated their facility “poor” or “failing” (Agency for Healthcare Research and Quality, 2011). This may be due to failure to promptly disseminate safety survey results and act on the themes perceived as unsafe areas for staff.

## Methods

### **Design**

This is a cross-sectional mixed-methods study designed to examine health care staff views of patient safety issues through a review of patient safety survey results. The design includes a) a quantitative secondary analysis of three years of AHRQ COSS surveys administered to PICU staff, and b) qualitative analysis of focus group and key stakeholder interview data. In addition, researchers made informal observations of workflow processes in order to understand what actually occurs in delivering patient care.

### **Setting and Sample**

This descriptive study was conducted in a 16 bed, mixed medical and surgical PICU at a Northern Californian tertiary academic healthcare institution. A convenience sample consisted of Hospital Unit Support Clerks (HUSC), Registered Nurses (RN), physicians, and Respiratory Therapists (RT) who work primarily in the PICU. The AHRQ COSS was distributed once each year for 3 consecutive years (2009-2011).

Because the PICU staff is relatively homogeneous, some of AHRQ COSS standard demographic questions were excluded to maintain participant anonymity. For example, since 92 % of staff are women, participants were not asked to report their gender since this information, along with the responses to other demographic questions, would allow for the identification of male RN respondents.

### **Instrument**

The quantitative survey tool used was the COSS survey created by AHRQ.

AHRQ sponsored the creation of the Survey on Patient Safety Culture along with a toolkit for analyzing and comparing survey data and resources for creating action plans to assist in promoting a safe culture (Agency for Healthcare Research and Quality, 2011).

The survey affords hospitals the opportunity to ask staff to rate areas such as teamwork and staffing as a means to measure a facility's level of safety (Clancy, 2011). The domains of the survey give staff an opportunity to respond openly and anonymously about their perceptions of safety. The intent of the survey is to increase staff awareness, to identify areas of strength and weakness, and to identify the effectiveness of interventions to improve perceptions of safety over time (Agency for Healthcare Research and Quality, 2011).

The qualitative tool used in this study was a series of eight questions derived from the general themes focused on from the COSS survey. The questions were asked of volunteer focus group participants to gain further meaning behind COSS survey responses.

## **Procedures**

The COSS surveys were distributed and completed by staff on a voluntary and confidential basis. Staff members with less than one month of experience were excluded from the survey. Over the course of three years, 185 surveys were completed. In addition, time was spent on the PICU informally observing the relationships between staff and the daily workflow. One focus group interview was conducted, and two key stakeholder interviews of one hour in duration were conducted.

Staff was surveyed for the years 2009, 2010, and 2011. A unique code was marked on the survey. The distribution of the COSS for this study was as follows: in 2009 the surveys were given to staff for completion at their mandatory annual skills fair. Physicians received the survey independently from the PICU Medical Director. This accounted for the higher number of returned surveys in 2010 and 2011. The 2010 and 2011 surveys were handed out by the researchers on the PICU unit. The surveys were distributed on both day and night shift. PICU staff was instructed to turn their survey in whether they chose to complete the survey or not. Respondents completed the survey and placed their sealed envelope in a locked box.

A focus group was conducted with PICU staff to authenticate the findings from the COSS surveys. The focus group was conducted in December of 2011. Responses came from seven staff that volunteered in response to an announcement posted in the PICU staff areas. The focus group participants were handed a copy of Figure 1 below (showing the overall Safety Grades for the units from 2009-2011) and asked what they thought about the results. A series of eight questions were presented in a semi-structured

format to participants with general themes focusing on staffing, communication, resources and support (see Figure 1). Staff expanded on the reasons for improved COSS results from 2009 to 2011. Key informant interviews were conducted with one frontline RN and one Assistant Nurse Manager II (ANII) who were randomly selected by the researchers to validate staff comments from the focus group as well as to obtain further information about the initiatives in place to improve patient safety. In addition, time was spent in the PICU informally observing the relationships between staff and how they affected daily workflow. Observations of the PICU community were necessary before determining how to promote the community that supports health, quality and safety.

- Script questions during focus groups
1. When I say, “culture of safety”, what does that mean to you?
  2. Many of the comments from the surveys relate to staffing to care for your high acuity PICU patients. Will you give me examples of what that looks like for/to you?
  3. Do current staffing levels have an effect on how you care for patients?
  4. Other than staffing, what concerns do you have about moving to the new PICU?
  5. Give examples of what the current method of communication among the patient care team looks like during a shift?
  6. Do current communication methods affect patient care? If so, how?
  7. How do you report unsafe incidents?
  8. How do you receive feedback on the incidents reported?

Figure 1

## **Data Analysis**

Phase one of the study examined the individual trajectory of change in the COSS over time. The researchers cleaned the data from the surveys for accuracy and aggregated the results to view a three-year trend of key survey questions. Responses from 47 questions and text comments were entered into a database: Microsoft Access. To ensure the accuracy of transcription of data from forms to the database, each researcher crosschecked the other's data entry for errors and omissions. All identifying features were removed to ensure anonymity. The data was drilled down to illustrate comparative and contrasting results from the COSS reports using excel spreadsheets. This data was then used to develop focus group questions that addressed the outstanding COSS survey themes of interest and opportunity for improvement.

Phase two of the study consisted of a focus group to better understand the findings identified in the survey. Interviews from the focus group were transcribed. All identifying features were removed to ensure anonymity. Using standard qualitative methodology, the researchers reviewed all transcripts and identified provisional themes. An iterative process of discussion with subsequent annotation of each transcript was used to identify final themes. The results and final themes were presented to PICU leadership and staff for possible areas on which to focus enhancement of safety culture perception and practice.

## **Ethics**

The study was reviewed and approved by the University of California, Davis, Institutional Review Board. No patients were involved in this study. The staff were approached by the researchers, who explained the purpose of the study, the activities expected of participants, and the participants' rights for and methods for ensuring self determination, privacy, and confidentiality. Through distribution of consent prior to focus group, staff were informed that their decision to participate would have no effect on their work and their responses would remain anonymous.

## **Results**

The distribution of the COSS for this study was as follows: in 2009 the surveys were given to staff for completion at their mandatory annual skills fair. Physicians received the survey independently from the PICU Medical Director. This accounted for the higher number of returned surveys in 2010 and 2011.

The demographic characteristics of the respondents were gathered based on available survey data and are shown in table 1. Of the 185 completed surveys received, 141 (76.2%) respondents were Staff Nurses, 23 (12.4%) were physicians, and 21 (11.3%) were ancillary staff. Participants had a range of 1-10 years of service at the institution; the majority had 1-15 years in their current profession.

Table 1

Table 1. Respondents Culture of Safety Survey (COSS) demographics			
	2009	2010	2011
<b>Position</b>			
RN	67 (80.7%)	43 (79.6%)	31 (64.5%)
MD	9 (10.8%)	5 (9.2%)	9 (18.7%)
Ancillary staff	7 (8.4%)	6 (11.1%)	8 (16.6%)
Total	83	54	48
<b>Time at current institution</b>			
<1 yr	7 (8.3%)	2 (3.7%)	7 (14.5%)
1-5 yr	42 (50%)	23 (43.3%)	11 (22.9%)
6-10 yr	18 (21.4%)	16 (30.1%)	19 (39.5%)
11-15 yr	7 (8.3%)	5 (9.4%)	5 (10.4%)
16-20 yr	3 (3.5%)	2 (3.7%)	1 (2.0%)
>20 yr	7 (8.3%)	5 (9.4%)	5 (10.4%)
Total	84	53	48
<b>Time in profession</b>			
<1 yr	4 (4.7%)	1 (1.8%)	4 (8.5%)
1-5 yr	38 (45.2%)	18 (33.9%)	14 (29.7%)
6-10 yr	17 (20.2%)	13 (24.5%)	14 (29.7%)
11-15 yr	11 (13.0%)	12 (22.6%)	7 (14.8%)
16-20 yr	6 (7.1%)	4 (7.5%)	1 (2.1%)
>20 yr	8 (9.5%)	5 (9.4%)	6 (12.7%)
Total	84	53	47

Phase 1: COSS survey results for *Overall Perception of Safety* and *Safety Grade* are presented in Figure 1 and Figure 2. The *Overall Perception of Safety score* is derived from the following individual survey questions: 1) Patient safety is never sacrificed to get more work done; 2) Our procedures and systems are good at preventing errors from happening; 3) It is just by chance that more serious mistakes don't happen around here; 4) We have patient safety problems in this unit.

The survey results revealed that respondents felt safety was compromised within the PICU. On a 100-point scale with 100 being maximal safety, the perception of safety in the PICU in 2009, 2010, and 2011 was  $58\pm 2$ ,  $56\pm 4$ , and  $70\pm 2$  respectively. The difference between scores for 2010 and 2011 was significant ( $p < 0.001$ ).

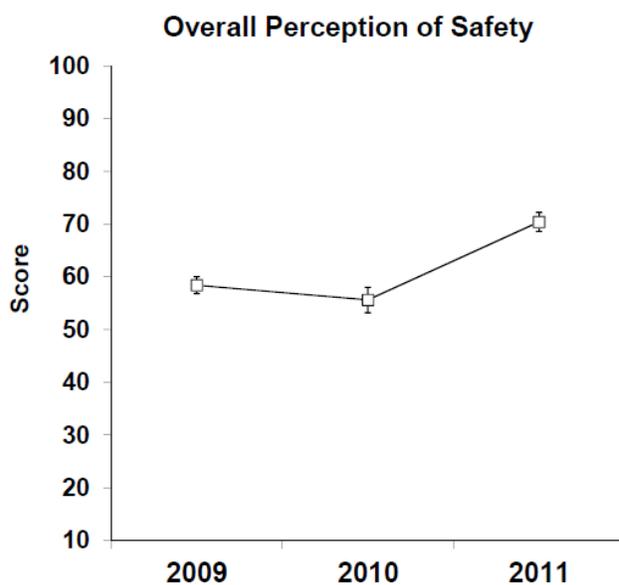


Figure 2

Another score was based on the overall *Patient Safety Grade*. It is derived from the survey question: Please give your work area/unit in this hospital an overall grade on patient safety. The *Patient Safety Grade* followed a similar pattern to that of the *Overall Perception of Safety*. The Safety Grade was lowest in 2010 with nearly one quarter of respondents providing a poor or failing grade. The PICU *Patient Safety Grade* score improved 32 percentage points from 2010 to 2011 showing a shift toward very good to

excellent. (In reporting the overall *Patient Safety Grade*, the researchers of this study accepted a threshold of 60%, as supported by Sexton et al (2001)).

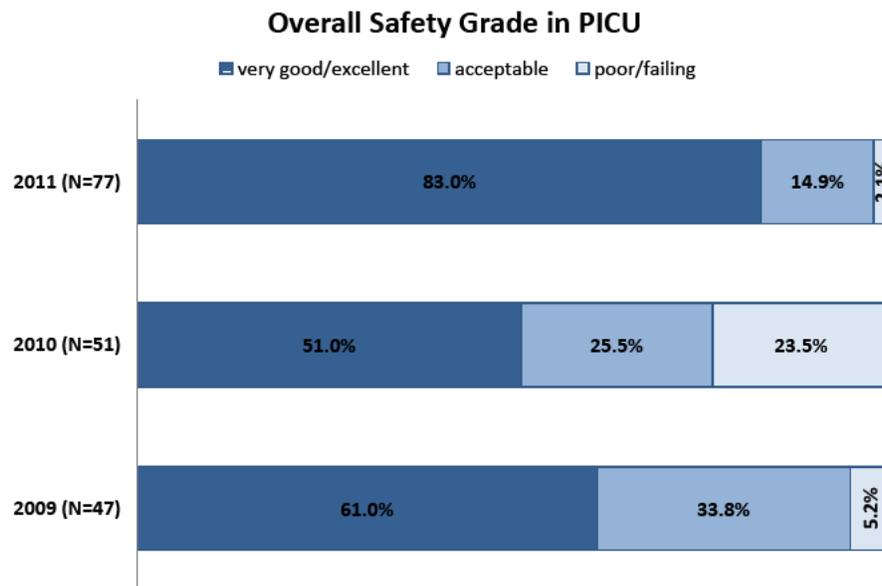


Figure 3

Significant improvements were identified over the three years of the study in every safety culture dimension except Hospital Management and Support of Safety.

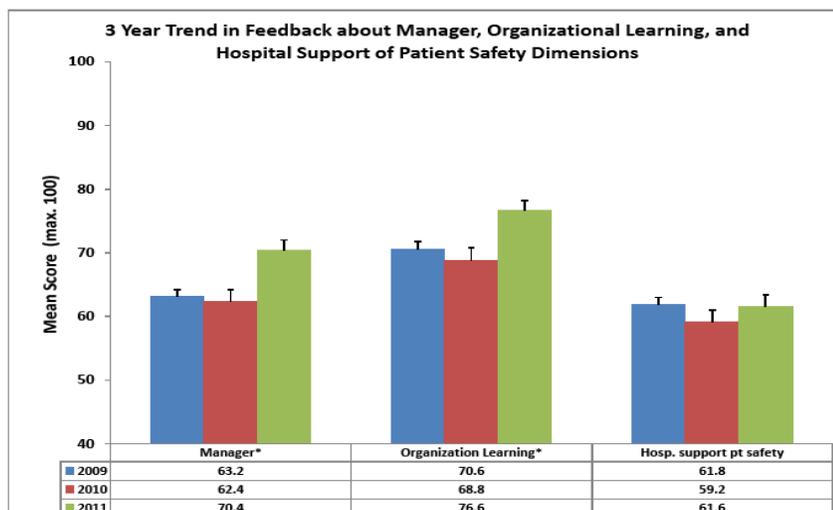


Figure 4

For each year of the study, we evaluated the correlation of the following eight safety culture dimensions to *Overall Perception of Safety* and *Patient Safety Grade*: 1) Management Actions and Expectations Promoting Safety; 2) Organizational Learning and Continuous Improvement; 3) Teamwork Within Hospital Units; 4) Communication Openness; 5) Feedback and Communication About Errors; 6) Non-punitive Response to Errors; 7) Staffing; 8) Hospital Management Support for Patient Safety.

One goal from the survey data analysis was to determine which safety culture dimensions were associated with either the *Patient Safety Grade* or *Overall Perception of Safety* during each year of the study. In 2009, none of the safety culture dimensions were meaningfully correlated, defined as correlation coefficient (cc) greater than 0.5, with overall *Patient Safety Grade*. However, in 2010, seven dimensions were significantly

correlated with the overall *Patient Safety Grade*, including Organizational Learning (cc 0.7194), Open Communication (cc 0.6315), Management (cc 0.5907), Non-punitive Response to Error (cc 0.5890), Feedback (cc 0.5366), Staffing (cc 0.5427), and Teamwork (cc 0.5050). Open Communication was the only safety dimension correlated with *Patient Safety Grade* in 2011 with a correlation coefficient of 0.6003.

Aligned with the findings for *Patient Safety Grade*, in 2009 none of the safety culture dimensions were meaningfully correlated with *Overall Perception of Safety*, while 6 dimensions showed significance in 2010. These included: Organizational Learning (cc 0.6557), Feedback (cc 0.5814), Open Communication (cc 0.5764), Management (cc 0.5742), Teamwork (cc 0.5179), and Staffing (cc 0.5036). In 2011, respondents identified Organizational Learning (cc 0.54477), Open Communication (cc 0.5324), and Management (cc 0.5313) as meaningfully correlated with *Overall Perception of Safety*.

Hospital Support of Patient Safety did not contribute to the changes that increased unit *Overall Perception of Safety*. In 2010, 32% of respondents agreed that hospital leadership seemed interested in patient safety only after an adverse event. Fifty-nine percent (59%) of all respondents had never reported an adverse event. When asked to give their opinion of teamwork within the PICU, respondents produced a mean score of 81.8 in 2009, 79.4 in 2010, and 86.0 in 2011.

Direct comments from staff were included as free text in the COSS results.

Comments made in this section support the correlation of Open Communication with the *Patent Safety Grade*.

“Patient care and safety could be improved by being able to communicate with concerns to the attending MD and charge nurse RN). Unfortunately, there are certain individuals that do not encourage open communication or lack follow up to concerns. It seems that it is these certain individuals that break down the chain of safety...” (2009, Staff Nurse)

“Communication is important for patient safety. When attending belittle staff whether it is a medical student, resident or RN, communication shuts down. During rounds it is important that no one is treated as if they are less intelligent as this does not foster learning or communication and thus does not foster patient safety” (2011, Staff Nurse).

Additional comments were directly related to staffing and lower patient safety:

“Proper staffing and breaks promote safety and decrease stress” (2009, staff Nurse). “Short staffing is the biggest obstacle for patient safety” (2010, Staff Nurse).

Survey results show that communication plays a critical role in whether staff feels supported in the safety of their environment. The opinion of how staffing affects safety was also identified as a key factor in this survey.

### **Staffing and Collaboration**

Phase 2: Proper staffing and collaboration among staff emerged as primary themes in the participants' perception of safety. During the focus group discussion, staff repeatedly stated that a Culture of Safety means:

“Proper staffing and collaboration among staff, and following hospital protocol bundles as they relate to Central Line Blood Stream Infections and Ventilator Associated Pneumonia (Staff Nurse).

Participants revealed they feel more supported by administration since their move to a new unit, which took place in November 2011: “They increased our staff since we are so spread out and people aren’t as familiar with things, they have allowed for increased help” (Staff Nurse).

Participants primarily perceived proper staffing as appropriate acuity, which allows them to safely take care of their patients: “In the old unit, since we were so close in proximity, it was easier to double [put patients together] even if it wasn’t a good double” (Staff Nurse). The participants felt that having two patients with acuity so high that they should not be doubled would be “not a safe assignment.” This practice was causing increased stress for staff in addition to preventing them from taking their breaks. An ANII explained:

“When staff refer to staffing, they are not referring to the number of patients; it’s more about how well they are able to care for their patients. They don’t mind the

doubles if they are appropriate, that the acuity is such that they can and should be doubled” (ANII).

The “old unit” consisted of two sides, East (six beds) and West “tower side” (eight beds). Something the ANII found particularly interesting was:

“We use to put our really sick kids on the tower side, our semi sick kids on the east side, and our not as sick kids in special care. Now all are kids were mixed and so all the cardiac cath patients, that used to go to special care, are with the really sick cardiac patients so it dilutes out the acuity in the cardiac section, and the special care Medsurg patients are grouped with the other patients so it gives you more 'pairable pairs.'”

Nurses recognize the demand placed on them in the workplace and often times this exceeds the ability to deliver safe care. Due to the fact that nurses carry out the biggest portion of patient care, they are at increased risk of receiving more blame for errors. Workplace demands that are evaluated in terms of work volume alone are measured by the number of patients, not by the complexity of the patient. When an acuity system measures a nurse’s work in quantitative measures and does not take into account the invisible aspects of nursing work, the nurse’s perception of patient safety is affected.

The hospital acuity system had been examined and changes made to reflect a more accurate acuity of the patient’s condition, according to the ANII. The new acuity tool allows for more time allotted for patient care and interventions, taking into consideration the complexity of care for a PICU patient.

The PICU had been going through some significant changes over the course of the three years in question. Staffing challenges contributed greatly to staff dissatisfaction as evidenced by the following quote. In 2009, the ANII stated:

“When that first survey came out we were in a really bad place. Things are much better now primarily due to increased staffing. Having 16 people out on long-term disability (LTD), eight on each shift, was placing a huge burden on us. This situation made it extremely difficult to properly staff the unit and contributed to increased stress and burnout for staff. During the 2010 staff evaluations, it was evident that staff that had worked at the organization for their entire career was on the verge of quitting because staffing was so bad. Once the staffing situation was addressed the overall situation improved.

### **Communication**

Failure to communicate patient care needs in a timely manner was another theme described by the participants. Lack of communication between nurses, managers and physicians was contributing to a low perception of safety. However, the participants credited their ability to communicate, even in the “old unit,” as one of their strongest attributes. In the old unit, due to the close proximity of coworkers, staff felt they could call out a patient care request or a need and it would be met. In the new unit fear was expressed, due to the bigger size of their new environment; their needs may not be heard or readily met. But staff continued to rely on their tradition of good communication. “Communication is still there, it has always been a part of our unit...” (Staff Nurse).

The Staff Nurses recognized that with the addition of the new ANII's there had been an increase in communication. Their voices were being heard.

“We’re being aggressively in-serviced. The ANIIs are doing a really good job getting information out to us and providing us with accurate feedback. Increased communication makes me feel like I can provide safer care and I am supported to do that” (Staff Nurse).

With the addition of physician/nursing rounds, a designated Attending for both Cardiac and ICU patients, and all staff, including the Residents, carrying a “Vocera”(a wireless communication device), staff’s perception of communication has improved. Additionally a unit based webpage was created that is owned by nursing leaders but also serves as a place for nursing staff to provide input into what is published on the webpage. This created another venue for feedback loop between leadership and staff.

Reporting adverse events identifies and communicates areas for improvement in the process. Participants revealed that staff sometimes does not take the time to fill incident reports out, but when they do, as one participant said, “I think it is a positive thing.” The participant felt that feedback was not always consistently given in response to incident reports. Yet, staff recognized the value of incident reports. One Staff Nurse said, “Double-checking drips with two RNs at shift change and when a cassette is changed in addition to documenting the double check on the Electronic Medication Administration Record [eMar]” is one positive outcome from reported incidents. Staff is encouraged to attend mortality and morbidity reviews as a way to receive feedback on incident

reporting, but as the ANII said, “nobody goes or reads the minutes; obviously that system doesn’t work.”

### **Resources**

Participants identified resources as another factor that influences their opinion of safe patient care. The availability of resources that would enable staff to do their jobs safely was a known area for improvement. During observation of workflow in the PICU, staff was observed having a difficult time finding the supplies they needed. One nurse drew the researcher’s attention to cords that were hanging from shelves and the lack of order in which supplies were stored. This caused concern about locating the correct item or finding it in an unexpected area of the supply room. The researchers also observed an RT using an artificial connection to connect endotracheal tubing with a makeshift connector, due to the unavailability of the appropriate piece of equipment. The importance of increasing resources, access to those resources, and organization of those resources was acknowledged by frontline staff and managers when they planned the move to the new PICU.

“The nurses that were enabling the move really thought about what we needed at the bedside and what we needed to do safe patient care, and attempted to make our job at the bedside as efficient and resourceful as possible. Just having that has made all the difference.” (Staff Nurse)

Staff verbalized that having the resources at the bedside, which they did not have before, will change how they feel about their job and how safe they feel compared to how they felt at the “old unit.” The lack of supplies on their carts and the disorganization of

their supply room created additional stress in an already stressful environment. The following account from an ANII reveals the seriousness of these circumstances.

“I remember having days when we ran out of supplies. We would order buckets and buckets from downstairs because what we had on our carts was not sufficient. This was due to cutting back on supplies in order to budget more efficiently. I remember going to start a drip and not having connectors, manifolds and trailers. They were trying to avoid some of the waste and things got cut that we needed. This was frustrating, and the process to get them back on the cart was even more frustrating. I would even go as far as to say this was not acceptable. I went home in tears one night just because I couldn’t get what I needed. I never do that. I can handle most anything.”

In designing the new unit, this problematic situation was taken into consideration. Staff’s recognition of what they needed at their fingertips in an emergency and how quickly they could get to it was an important factor. The redesign of all their supply rooms so that they “made more sense” (ANII) has allowed staff to quickly find what they need in an emergency and has therefore enhanced their ability to provide safer patient care. The addition of extra Hospital Unit Support Coordinator’s (HUSC)’s, Social Workers, Child Life Specialists, and other support staff assigned specifically to the PICU was also recognized as an extra resource in making the participants feel better supported and equipped to provide quality, safe patient care.

Key stakeholder interviews revealed similar findings supported by feedback from the focus groups. It was perceived that an inadequate supply of resources had “added to

[patients'] increased rate of infections.” Respondents also sensed that communication in general had been poor. The lack of follow-up on the first two years of survey findings reinforced staff’s suboptimal perception of the culture of safety within their unit.

## Discussion

Cultural beliefs and attitudes in the healthcare workplace environment play an important role in the perceived sense of safety experienced by healthcare staff. Staff’s perceptions of safety must be considered in order to build a culture of safe work practices and safe patient care.

It is important to recognize the distinction between culture and organizational structure (policies, procedures, standards of behavior) —the two have to support one another. Often culture does one thing and structure does another. Health care staff are guided by values that are not contained by the organizational structures around them. The burden is put on health care staff to behave under the assumption that behavior is simply of one’s own will because the “right” cultural values are being professed in the organization when in fact, the values may be there, but organizational structure works against those ideals.

The evolution of improving safety in the PICU environment is a model example of effective use of the safety survey. In 2009, the PICU was faced with the physical merger of two small units to one large unit in a new location. The move was scheduled for the end of 2011. In order to achieve a smooth transition with no delays or compromises in safe patient care, the PICU leadership wanted to know what the staff thought of their current work environment. It was the belief of PICU leadership that the

ability to implement changes before the move would create a sense of security and pride in the new work environment. The AHRQ COSS was chosen as the instrument by which staff perceptions would be assessed.

The 2009 and 2010 COSS results were belatedly shared with the leadership at a planning meeting for the new unit. Based on these findings, further assessment was deemed necessary to determine which specific changes were needed to improve the overall perception of safety. Leadership met with frontline staff to collaborate on ideas to improve safety in December 2010. RNs in supervisory roles that were also part of the new unit planning team began to implement changes in the key areas of communication, staffing and resources. PICU leadership hoped to see an improvement in the 2011 survey results following the changes implemented and before the move. And they did.

The results allowed leadership the opportunity to evaluate and examine potential challenges and barriers to providing safe patient care. However, at this point the actual survey results had not been shared with staff. A shift in culture can be a challenge and should be supported not only by leadership but by staff as well. As the ARHQ work demonstrates, hospitals that involve staff in creating action plans experienced increases in survey dimension scores. Hospitals that struggled with what survey information should and should not be shared with staff and that noted a lack of communication and accountability between staff and management experienced decreases in scores.

Phase two of this study was to share the results of the COSS surveys with the PICU staff, discuss their reactions to the results, and explore their ideas behind the survey responses in a focus group. PICU staff were invited to participate to explore answers to

these questions and others. Exploration into the meaning behind staff responses to the survey can provide insight into how staff values, attitudes, norms, beliefs, policies, behavior, and communication skills relate to patient safety.

The responses were enlightening and candid. Nurses' responsible concern for their unit is captured in the discussion. Their comments validate the main themes of opportunities to improve safety even though the themes from the surveys discovered by the researchers were not divulged to the focus group ahead of the discussion. This finding is an important strength of this study. It shows the vital significance and relevance of the voice of the nursing staff in developing quality process change. The themes discovered are similar to those found by other studies. A team's utility and efficiency are tied directly to its team members and their ability to integrate various personal and situational characteristics (AHRQ, 2011). Debriefing staff members who filled out the surveys is essential in cultivating a safe work environment.

Staff does not consistently communicate their opinions of the environments in which they provide care. They rely on their healthcare organizations to provide them with the tools and resources required for safe, quality care. When an organization does not recognize the importance of staff's perception of safety, that organization is at risk for increased adverse events and unsafe conditions. An environment that supports a culture of safety, on the other hand, is one that operates to implement the desired changes and also to sustain them. When an organization is dedicated to improving quality and safety, enabling staff to openly share their opinions and feelings about the environment in which they deliver care allows for a more collaborative, interdisciplinary focus on patient care. Exploration into the meaning behind staff responses to the survey provides insight into

how staff values, attitudes, norms, beliefs, policies, behavior, and communication skills affect patient safety.

The literature on patient safety has identified multiple critical factors that affect patient safety and the safety culture that underpins staff behavior. Chief among these are leadership and communication. Two factors that also proved important to this study were staffing and availability of resources.

Leaders have the ability to help create an atmosphere where staff not only feels heard, but experience results from the feedback leaders provide about patient safety in their areas. When leadership does not take an active role in fostering a culture of safety within their organization patient safety can be compromised. When leaders only rely on the results from a survey when identifying safety concerns within their area, they are at risk of creating a non-sustainable safety environment. For example, an organization's safety survey results reveal that staff perceives deficient patient care handoffs between other units. Leaders, charged with improving this process, create a new handoff report tool, but have missed that the root of the deficiency is the lack of willingness to participate in handoff reports. Leaders need to talk to staff regarding what is behind their response and not interpret their responses before creating action plans.

Responses from the PICU safety survey were congruent with the literature that described compromised patient safety. Chief among these factors is hospital staff's perception of safety. An unsafe environment is one that lacks consistent communication. Of particular concern from the PICU COSS survey was adequate staffing. A 2008 study by Kotzer and Arellana compared staff nurses' perceptions of their real versus ideal work

environment. These findings suggest that staffing issues are one of the most important variables affecting whether nursing staff perceive that they work in an unsafe environment. Inaccessibility to resources was also a concern. Little has been published about the effects that time spent finding supplies and the availability of supplies in general have on how staff perceive the safety of their work environment. Hall, Pederson, Hubley, Ptack, Hemingway, et al (2010) found a strong association between interruptions of this kind in the workplace and delays in patient care. Overall communication between care providers in the PICU related to patient care and safety concerns was a third survey area identified as an opportunity for improvement.

The environment in which healthcare providers work should be one that ensures their ability to provide safe, quality care. When staff cannot rely on leadership to create and sustain this environment, they assume that their own priorities for patient care are not aligned with the goals and mission of the institution for which they work. Genuine leadership is pivotal in developing and maintaining a healthy work environment. The Joint Commission supports the need for effective communication to create safe patient care practices. Effective communication among caregivers is essential for a functioning team. Ineffective communication is the most commonly cited cause for sentinel events (The Joint Commission, 2010). A PICU is a stressful and demanding work environment that experiences tragic outcomes for some of their young patients despite safe care delivery. We hypothesize an additional performance obstacle of ineffective communication fragments the ability to provide safe patient care even further.

## Conclusion

Conducting a survey to assess staff attitudes regarding the safety of the work environment is a valiant step towards improving patient safety, but the real work begins when the results are communicated and purposeful discussion about how to improve the conditions requiring action takes place between leaders and frontline staff.

Three key themes that emerged from this study are staff dissatisfaction with PICU staffing, fragmented communication between caregivers, and the inaccessibility to necessary resources to deliver timely patient care. Findings from this study show that survey text comments and focus group discussions reveal staff desire and willingness to be heard and to be part of the solution. Staff members have critical firsthand experience that is key to implementing plans for safer patient care, and their feedback should be actively solicited and carefully considered.

Strengths of this study are the strong support of teamwork in the PICU and the overall improvement of the survey results over the three years. It was apparent from the focus group discussion that staff were acutely aware of safety challenges. They were also forthcoming about already-implemented positive changes that were improving how nurses delivered patient care in the PICU.

A limitation to this study is the overall low sample size. While rich discussion and key safety improvement information was gained by speaking to the PICU nursing staff, more study is needed to determine the culture of an organization as a whole. Cohesive, consistent and sustainable change throughout the entire hospital will be necessary to permanently improve safe patient care. Involving frontline staff in identifying factors that

create unsafe conditions and developing ideas to improve patient safety will result in sustainable safety practices and organizational safety improvement.

### Acknowledgment

The authors wish to acknowledge the staff and department manager in the PICU who took the time to complete the surveys and participate in focus groups and interviews; and the medical director for her exceptional leadership, guidance and contributions to this study. Additionally the authors would like to express gratitude for the financial and intellectual support provided by the Betty Irene Moore School of Nursing staff and faculty.

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