



# Patient Safety Culture Measurement and Improvement: A “How To” Guide

Mark Fleming

O wad some Power the giftie gie us  
To see oursels as ithers see us!

(from “To A Louse” by Robert Burns, 1759–1796)

**It** is widely accepted that the desired improvements in patient safety require a change in the culture within healthcare (CPSI 2004; IOM 2000; NPSA 2004). The Institute of Medicine (IOM) report “*To Err Is Human*” concluded that “the status quo is no longer acceptable ... Health care organizations must develop a culture of safety” (IOM 2000: 14). In the UK, building a safety culture is the first step of the National Patient Safety Agency’s (NPSA) seven-step guide to improving patient safety. In Canada, safety culture is one of the Canadian Council on Health Services Accreditation’s (CCHSA) five patient safety goals and required organizational practices. It is therefore important that senior administrators and clinical managers have a sound understanding of safety culture, so that they can make informed decisions about improvement strategies.

The recognition of the importance of cultural factors is based on research conducted in other high reliability industries such as nuclear power and petrochemical processing. The investigation into the Chernobyl disaster concluded that a poor safety culture

at the facility was a significant causal factor. The Advisory Committee on the Safety of Nuclear Installations produced the most widely accepted definition of safety culture.

The safety culture of an installation is the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of an organization’s health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by the efficacy of preventive measures. (ACSNI 1993: 23)

The recognition of the importance of cultural factors stimulated a significant amount of research aimed at developing and validating safety culture<sup>1</sup> instruments. These instruments are now used routinely in high reliability industries to assess the current culture and identify actions to improve and track change overtime. There is now good evidence linking responses on these instruments with important health and safety outcomes, such as micro accidents (Zohar 2000), self-report accidents (Lee 1998), safety behaviour (Mearns et al. 2001), company accident statistics (Niskanen, 1994) and safety audit scores (Zohar 1980).

1. There has been considerable debate about the relationship between safety culture and safety climate. It is now generally accepted that the two concepts are closely related and that safety climate consists of the surface elements of the safety culture and can be measured using quantitative measures. The interested reader can refer to Cox and Flin (1998) and Guldmund (2000) for a more detailed discussion.

Within a healthcare context, safety culture influences patient safety by motivating healthcare professionals to choose behaviours that enhance, rather than reduce, patient safety (Nieva and Sorra 2003). Singer and colleagues (2003) identified the following seven patient safety culture elements:

- Leadership commitment to safety
- Organizational resources for patient safety
- Priority of safety versus production
- Effectiveness and openness of communication
- Openness about problems and errors
- Organizational learning
- Frequency of unsafe acts

## TEN-STEP PROCESS TO SUCCESSFUL SAFETY CULTURE MEASUREMENT AND IMPROVEMENT

Currently, there is relatively little experience in healthcare of implementing safety culture measurement and improvement initiatives. This lack of experience may increase the risk that safety culture interventions may fail to achieve their objectives. Fortunately, safety culture interventions are commonly used in other industries such as nuclear power and the petrochemical industry. The lessons learned from these industries are summarized in the 10-step process outlined below.

### 1. Build capacity

Conducting a safety culture survey is a major initiative and organizations must develop some expertise in safety culture measurement and improvement before commencing the process. Although it is possible to get support from external experts, they are not familiar with organizational requirements. Specifically, internal expertise is required to decide if a safety culture measurement is appropriate, to select the most suitable measurement approach, to select an external provider (if necessary) and to ensure the sustainability of the process.

It is often useful to create a small team to coordinate the initial phases of safety culture measurement. At this stage, the team should be small and contain representatives from quality, risk management and clinical staff. Team members should develop their knowledge of safety culture by reading key references (e.g., Guldenmund 2000; IAEA 2002; NPSA 2004). The team should review the available measurement instruments and select the one that is most appropriate for their purposes. They should also calculate the resources required to undertake the survey, including key individuals to involve, the need for external support, staff time to complete the survey, data entry and analysis.

### 2. Select an appropriate survey instrument

Recently, numerous researcher teams have attempted to develop patient safety culture instruments. Early instruments were

adapted versions of questionnaires developed in other industries (e.g., Thomas et al. 2003). More recently, instruments have been developed specifically for healthcare (e.g., Sorra and Nieva 2004). There is now a range of safety culture instruments available to healthcare organizations. CCHSA encourages organizations to conduct safety culture surveys and lists three potential questionnaires on their website:

- Safety attitudes questionnaire (Sexton et al. 2004)
- Stanford instrument (Singer et al. 2003)
- Hospital Survey on Patient Safety Culture (Sorra and Nieva 2004)

In addition to the above, a modified Stanford instrument (Gingsburg et al. in press) has been used in a number of Canadian hospitals. The variety of instruments available raises the question: which instrument is the best? Not surprisingly, there is not one best instrument, as they all have strengths and weaknesses. **Table 1** provides an overview of the instruments, including the elements of safety culture that they purport to measure and their strengths and weaknesses. Organizations need to select the instrument that is most appropriate for their purposes.

### 3. Obtain informed leadership support

Although it is widely accepted that management support is required for an intervention of this nature, it is not uncommon for it to be missing (Nieva and Sorra 2003). It is critical to ensure they are providing informed support, which means they understand the survey process, the resources required, potential problems and typical results. Informed support can be obtained by holding a senior leadership workshop to provide an overview of the project, the resources required, the instrument being used and importance of implementing follow-up actions.

It is also critical that leaders understand that the results are going to be shared widely and, therefore, may enter the public domain. This could produce unwanted media attention, and it is important that leaders are confident that they are willing to share results that may portray the organization in a negative light. For example, how comfortable would they be in releasing a report that included statistics such as: 50% of healthcare staff agreed with the statement, “In the last year, I have witnessed a co-worker do something that appeared to me to be unsafe for the patient, in order to save time.” There is often a reluctance to emphasise the potential downsides of conducting the survey, as senior leaders may decide not to support the survey. Clearly, this is a risk, but it is better not to go ahead with the survey than to have a long protracted argument with senior leaders about the publication of the results. This delay in publication will make people cynical and impede the implementation of interventions and, in the end, may damage the culture, not make it better.

**Table 1: Patient safety culture instruments**

	Safety attitudes questionnaire	Stanford instrument	Modified Stanford instrument	Hospital survey on patient safety culture
Elements measured	<ul style="list-style-type: none"> <li>• Teamwork</li> <li>• Safety climate</li> <li>• Job satisfaction</li> <li>• Stress recognition</li> <li>• Perceptions of management</li> <li>• Working conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Organization</li> <li>• Department</li> <li>• Production</li> <li>• Reporting/seeking help</li> <li>• Shame/self-awareness</li> </ul>	<ul style="list-style-type: none"> <li>• Valuing safety</li> <li>• Fear of negative repercussions</li> <li>• Perceived state of safety</li> </ul>	<ul style="list-style-type: none"> <li>• Supervisor/Manager expectations &amp; actions</li> <li>• Organizational learning</li> <li>• Teamwork within units</li> <li>• Communication openness</li> <li>• Feedback &amp; communication about error</li> <li>• Non-punitive response to error</li> <li>• Staffing</li> <li>• Hospital management support for patient safety</li> <li>• Teamwork across hospital units</li> <li>• Hospital handoffs &amp; transitions</li> <li>• Self-reported outcome variables</li> </ul>
Questionnaire length	60 items	30 items	32 items	79 items
Reliability	Alpha’s range from .65–.83	Not published	Alpha’s range from .66–.86	Alpha’s range from .63–.84
Questionnaires available from:	<a href="http://www.uth.tmc.edu/schools/med/imed/patient_safety/surveyandtools.htm">http://www.uth.tmc.edu/schools/med/imed/patient_safety/surveyandtools.htm</a>	Items published in (Singer et al. 2003)	Liane.Ginsburg@mail.atkinson.yorku.ca	<a href="http://www.ahrq.gov/qual/hospculture/">http://www.ahrq.gov/qual/hospculture/</a>
Strengths	<ul style="list-style-type: none"> <li>• Questionnaire freely available</li> <li>• Tested on a large sample</li> <li>• Detailed report describing instrument</li> <li>• Adequate psychometric properties</li> <li>• Some benchmark data</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaire freely available</li> <li>• Tested on a large sample</li> <li>• Research paper describes development and factor structure</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaire freely available</li> <li>• Good psychometric properties</li> <li>• Relatively short questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaire freely available</li> <li>• Good psychometric properties</li> <li>• Tested on a large sample</li> <li>• Comprehensive coverage of safety culture elements</li> <li>• Good supporting documentation</li> <li>• Benchmarking data available</li> </ul>
Weaknesses	<ul style="list-style-type: none"> <li>• Questionnaire relatively long</li> <li>• Not specifically designed to measure safety culture</li> </ul>	<ul style="list-style-type: none"> <li>• Reliability scores not published</li> <li>• The items contained in factors I and II do not seem to fit with the concepts they purport to measure</li> </ul>	<ul style="list-style-type: none"> <li>• Measures limited number of safety culture dimensions</li> </ul>	<ul style="list-style-type: none"> <li>• Questionnaire relatively long</li> </ul>

#### 4. Involve healthcare staff

The purpose of the conducting the survey is to bring about the cultural change in healthcare advocated by CCHSA, CPSI, IOM and NPSA. As noted by Carroll (1998), it is important that the safety culture measurement process is consistent with the culture that you are striving to achieve. Since employee involvement is a key aspect of a positive safety culture, it is beneficial to involve key groups in planning and implementing the survey. Employees can be involved in the process by having representation on a steering committee, assisting in survey distribution at departmental level or, at a minimum, being regularly informed about the safety culture survey. The aim is for all healthcare workers to feel vested in the process, as opposed to feeling that this is something that is being done to them.

#### 5. Survey distribution and collection

A key challenge in conducting any survey is obtaining a high response rate. Conducting surveys within healthcare organizations is a logistical challenge given the large numbers of potential respondents, many who are not directly employed by the organization. Although healthcare professionals have a reputation for being reluctant to complete surveys (Donaldson et al. 1999), some patient safety culture surveys have obtained response rates of over 90% (e.g., Boiteau 2005).

The distribution and collection strategy adopted can have a major impact on the response rate obtained. Making participation easy, safe and relevant can enhance response rates. Limiting the length of the survey, dedicating specific time for the participants to complete the survey or paying participants can make participation easier. Although Web-based surveys are cost-effective, this method may not be appropriate in healthcare due to limited access to computers (Nieva and Sorra 2003). Anonymity is the simplest way to ensure that survey participation is perceived to be safe. It is also important to carefully review the demographic questions to ensure that they do not inadvertently identify individuals. The perceived relevance of the survey can be enhanced by a comprehensive information campaign before the survey is distributed. Departmental champions, who distribute surveys and encourage participation, can increase relevance and response rates.

#### 6. Data analysis and interpretation

A safety culture survey can easily result in information overload because of the number of items and the range of ways these data can be analyzed (e.g., by occupation, department or tenure). In addition, it can be difficult to interpret the results, as there is no ideal safety culture profile. For example, is it a good result if 20% of

respondents agree with the statement, “My supervisor overlooks patient safety problems that happen over and over”? It is clearly better than 70% agreeing with the statement, but it is not good that a fifth of respondents have concerns about their supervisors taking action to resolve safety incidents. To aid with interpretation, it is important to look at a pattern of responses rather than individual items responses. The items contained in the questionnaires listed in **Table 1** form factors or concepts such as “teamwork.” Average scores on these factors provide information about the state of teamwork in general. This still leaves the problem of what is an acceptable level of teamwork. Ideally, organizations would be able to compare their results against organizations with the best patient safety outcomes. Sadly, such a database does not exist. Currently, the best answer to this question is to compare your responses with published data (see Ginsburg et al. in press; Sorra and Neiva 2004; Sexton et al. 2004; Singer et al. 2003).

#### 7. Feedback results

Giving participants rapid feedback of the results can help maintain interest and involvement. Initial communication can include updates on the response rate to encourage participation. Ideally, the main results should be presented orally and include the next steps and a timeline for the improvement actions. Often the feedback of results is delayed by organizing sessions (e.g., getting time in senior managers’ diaries). These delays can be reduced by planning the feedback sessions and setting dates (but not announcing) before the surveys are distributed. It is not necessary to know all the improvement actions at this stage, but it is important to outline a timeline and a plan to specify the actions.

#### Training can improve safety culture perceptions

Currently, there is little empirical research evaluating the effectiveness of patient safety culture interventions. Ginsburg et al. (in press) evaluated the effectiveness of training intervention at improving patient safety culture. Initially, they surveyed 338 nurses in clinical leadership roles. The sample consisted of nurses who voluntarily attended two patient safety workshops (study group) and those who did not attend the workshops (control group). The training included presentation on the rate of adverse events in healthcare, theoretical models of human error, how to learn from errors, teamwork and safety leadership. Both groups were resurveyed 10 months later to assess the impact of the training intervention. There was a significant improvement in safety culture perceptions among nurses who received the training, while there was no improvement in control group perceptions. Training interventions offer a relatively cost-effective way to improve patient safety culture.

### 8. Agree interventions via consultation

Conducting safety culture surveys have been likened to “describing the water to a drowning man”; in other words, they tell you how bad things are, but provide little assistance in identifying the solutions (Fleming 2003). A useful strategy to assist in identifying practical solutions is to conduct a series of focus groups with a representative sample of participants. For each of the elements measured by the survey, participants can be asked to describe the positive aspects, areas requiring improvement and practical actions that will make a real difference. The information produced can readily be turned into a comprehensive action plan (see Fleming and Meakin 2004).

### 9. Implement interventions

A common complaint by employees who participate in safety culture assessments is the lack of action based on the results of the survey (Nieva and Sorra 2003). There are a number of reasons for this perception. First, it is often an accurate perception as senior administrators do not know what actions to take and, therefore, do not take action. Second, there is such a time lag between completing the survey and subsequent actions that people have forgotten about the survey. Third, the subsequent interventions are not explicitly linked to the survey results.

### 10. Track changes

One of the primary reasons given by healthcare organizations for conducting a safety culture survey is to obtain a baseline against which to measure improvement. Tracking changes in perceptions over time is a challenge with anonymous surveys. For example, if there is a 50% response rate to the initial survey, and there is a similar response rate to the follow-up survey, it is very possible that any difference in the responses is due to different people responding on the two occasions. Even when there is a high response rate (e.g., 90%), it is not possible to perform the correct statistical test (a paired sample t-test) to establish if any change is statistically significant, as it is not possible to link respondents from the initial survey with those in the follow-up survey. One solution to this problem is to get participants to generate a code that is unique to them, but cannot be used by the organization to identify them individually. Asking participants a series of questions, which will produce the same responses over time, can be used to create an individual code. For example, their unique code could be generated by asking for the first two letters of their mother's first name, the

#### Benchmarking safety culture change: An offshore oil industry example

Benchmarking performance against other similar organizations is popular among healthcare organizations. Safety culture surveys offer another metric that can be used for benchmarking purposes. Mearns and colleagues (2000) conducted a safety culture benchmarking exercise with nine offshore installations in the UK to assess the impact on safety culture. They used a self-completion survey to assess the safety culture on the nine installations. The questionnaire measured six dimensions of safety culture (e.g., management commitment to safety). Each participating installation was provided with a report summarizing their results including graphs comparing their performance with other participating installations. This provided installations with information on their strengths and weaknesses relative to their peers. Organizations were then expected to use these results to implement change in order to improve their culture. One year later, the nine installations were resurveyed. Installations varied in the degree of improvement. For example, one installation did not improve on any of the six factors, while another installation improved on all six factors. The authors concluded that safety culture improvement was dependent on the actions taken by the installation management. Specifically, the installation with the greatest improvement increased levels of employee involvement in health and safety, took action to demonstrate management commitment and improved health promotion. Benchmarking aids in identifying strengths and weaknesses, but, unless this information is translated into action, the exercise in itself does not improve safety culture.

first two letters of their mother's maiden name, the first two letters of their father's first name and the day of the month that they were born.

### CONCLUSION

To borrow Burns's metaphor, safety culture surveys give organizations the gift to see themselves as others see them. They provide invaluable information about how patient safety is viewed within an organization. Correctly implemented, a safety culture measurement and improvement process can act as the tipping point for superior patient safety. This makes conducting a safety culture survey very attractive, but organizations must be cautious, as a poorly implemented survey can damage the culture. For example, if the survey identifies a series of actions to improve and these are not implemented in a timely fashion, then this demonstrates a lack of leadership commitment.

### References

- Advisory Committee on the Safety of Nuclear Installations (ACSNI). 1993. *Human Factors Study Group Third Report: Organising for Safety*. London: HMSO.
- Boiteau, P. 2005, May. Patient Safety Culture Explained – Keynote Presentation at the First *Safer Health Care Now!* Conference. Calgary, AB.

Canadian Patient Safety Institute (CPSI). 2004. *Strategic Business Plan 2004/2005–2007/2008*. Edmonton, AB: Author.

Carroll, J. 1998. "Safety Culture as an Ongoing Process: Culture Surveys as Opportunities for Enquiry and Change." *Work and Stress* 12: 272–84.

Donaldson, G.W., C.M. Moinpour, N.E. Bush, M. Chapko, J. Jocom, M. Siadak et al. 1999. Physician Participation in Research Surveys: A Randomized Study of Inducements to Return Mailed Research Questionnaires. *Eval Health Prof* 22(4): 427–41.

Fleming, M. 2003. "A Solution Focused Approach to Safety Culture Measurement." *HR Professional* August/September.

Fleming, M. and S. Meakin. 2004, March. Health and Safety Culture Maturity Model: Improvement Through Involvement. Paper presented at the 7th SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production, Calgary, Alberta, Canada.

Gingsburg, L., P.G. Norton, A. Casebeer and S. Lewis. in press. "An Educational Intervention to Enhance Nurse Leaders' Perceptions of Patient Safety Culture." *Health Research and Educational Trust* 1–24.

Guldenmund, F.W. 2000. "The Nature of Safety Culture: A Review of Theory and Research." *Safety Science* 34: 215–57.

Institute of Medicine (IOM). 2000. "To Err Is Human: Building a Safer Health System." In L.T. Kohn, J.M. Corrigan and M.S. Donaldson, eds. Washington, DC: National Academy Press.

International Atomic Energy Agency, Vienna (IAEA). 2002. *Self-Assessment of Safety Culture in Nuclear Installations: Highlights and Good Practices*. Author.

Lee, T. 1998. "Assessment of Safety Culture at a Nuclear Reprocessing Plant." *Work and Stress* 12: 217–37.

Mearns, K., R. Flin, R. Gordon and M. Fleming. 2001. "Human and Organizational Factor in Offshore Safety." *Work and Stress* 15(2): 144–60.

Mearns, K., S. Whitaker, R. Flin, R. Gordon and P. O'Connor. 2000. *Factoring the Human into Safety: Translating Research into Practice. Vol. 1 - Benchmarking Human and Organisational Factors in Offshore Safety*. OTO 2000 061. Sudbury: HSE Books.

National Patient Safety Agency (NPSA). 2004. *Seven Steps to Patient Safety*. London: Author.

Nieva, V.F. and J. Sorra. 2003. "Safety Culture Assessment: A Tool for Improving Patient Safety in Healthcare Organizations." *Quality and Safety in Health Care* 12: 7–23.

Niskanen, T. 1994. "Safety Climate in the Road Administration. *Safety Science* 17: 237–55.

Sexton, J.B., E.J. Thomas, R.L. Helmreich, T.B. Neilands, K. Rowan, K. Vella, J. Boyden and P.R. Roberts. 2004. *Frontline Assessments of Healthcare Culture: Safety Attitudes Questionnaire Norms and Psychometric Properties. Technical Report 04-01*. The University of Texas Center of Excellence for Patient Safety Research and Practice. AHRQ Grant # 1PO1HS1154401.

# Building patient confidence by safeguarding patient safety

## Diagnosis and protection of the healthcare imperative

Deloitte's health services professionals develop effective business solutions within the Canadian healthcare environment. Our mission is to help our clients respond to current and emerging challenges, achieving value for healthcare organizations and their stakeholders.

For more information contact

Irene Podolak  
(416) 643 8950  
ipodolak@deloitte.ca

[www.deloitte.ca](http://www.deloitte.ca)

# Deloitte.

Audit • Tax • Consulting • Financial Advisory.

© Deloitte & Touche LLP and affiliated entities.

Singer, S.J., D.M. Gaba, A.D. Geppert, A.D. Sinaiko, S.K. Howard and K.C. Park. 2003. "The Culture of Safety: Results of an Organization-Wide Survey in 15 California Hospitals." *Quality and Safety in Healthcare* 12: 112–18.

Sorra, J.S. and V.F. Nieva. 2004, September. Hospital Survey on Patient Safety Culture. (Prepared by Westat, under Contract No. 290-96-0004). AHRQ Publication No. 04-0041. Rockville, MD: Agency for Healthcare Research and Quality.

Thomas, E.J., B.J. Sexton and R.L. Helmreich. 2003. "Discrepant Attitudes About Teamwork Among Critical Care Nurses." *Critical Care Medicine* 31(3).

Zohar, D. 1980. "Safety Climate in Industrial Organizations: Theoretical and Applied Implications." *Journal of Applied Psychology* 65(1): 96–102.

Zohar, D. 2000. "A Group-Level Model of Safety Climate: Testing the Effect of Group Climate on Microaccidents in Manufacturing Jobs." *Journal of Applied Psychology* 85(4): 587–96.

### About the Author

**Mark Fleming**, PhD, is Director CN Centre for Occupational Health and Safety, Saint Mary's University, Halifax, Nova Scotia. Contact: [Mark.fleming@smu.ca](mailto:Mark.fleming@smu.ca)