How Quality Improvement Projects Influence Organizational Culture

Leona R. Zboril-Benson and Bernice Magee

A culture of blame has thrived for decades within the healthcare system. When incidents occurred, we looked for the person to blame; the proverbial bad apple. Research findings have shown that this "blaming culture" persists and continues to operate in many healthcare organizations (Lawton and Parker 2002; Ricci et al. 2004; Stanhope et al. 1999; Vincent et al.1999). A culture of safety in healthcare is strongly emphasized in the patient safety literature (Baker et al. 2004; Mohr et al. 2004; National Steering Committee on Patient Safety [NSCPS] 2002) and elsewhere (Canadian College of Health Services Executives [CCHSE] 2005; Canadian Council for Health Services Accreditation [CCHSA] 2004). Culture shapes patient safety by influencing employees' readiness to question the actions of others, challenge authority and freely disclose one's own mistakes (Helmreich and Merritt 1998). To transition towards an organizational culture of safety and quality requires the commitment of leaders, physicians and staff. The Insulin Project at the University of Alberta Hospital (UAH) within the Capital Health region (Edmonton, AB and area) is an example of how a quality improvement project can influence organizational culture.

Organizational culture has been defined as "shared basic assumptions" (Schein 1992). Culture conveys a sense of what is valued and how things should be done within the organization; it represents "how things are done around here" (Schein 1992). Organizational culture has been described as collective phenomena that embody individuals' responses to uncertainty and chaos (Sleutel 2000). Culture includes the norms, values and rituals that characterize a group or organization. Culture serves as a social control mechanism that sets expectations about appropriate attitudes and behaviours of group members, thus guiding and constraining their behaviour. Organizational culture is transmitted to organizational members and subsequently reinforced through stories, rituals and language.

In healthcare, subcultures often develop. Subcultures develop around a subset of organizational members who identify themselves as a distinct group and interact regularly (Van Maanen and Barley 1985). Subcultures are important since they suggest that an organization's culture is not unitary, but rather consists of numerous, small cultures all existing within the same organization (Riley 1983). Many hospital cultures are composed of many subcultures (e.g., departments or programs, patient care units, disciplinary groups) (Coeling and Simms 1993a, 1993b; Deal et al. 1983).

Westrum (2004) distinguished three levels of organizational safety culture that vary systematically in how an organization responds to the problems and opportunities encountered: (1) pathological, (2) bureaucratic, (3) generative (learning). Pathological organizations are characterized by hiding information, "shooting" the messenger, covering up failures and actively crushing new ideas. The second type of organization – the bureaucratic – ignores information, tolerates messengers, promotes itself as being just and merciful, and believes that new ideas create problems. The most sophisticated organization, the

learning organization, is one in which information is actively sought, messengers are trained, failures result in inquiry and new ideas are welcomed. Westrum (2004) asserted that organizations move through the levels as they mature in terms of their approach to safety issues. We believe that, at the beginning of the project, the pilot units were faced with significant cultural change to make the shift toward the generative level by the conclusion of the project.

In this paper, we will describe how hospital leadership, the Insulin Project and the project team helped to transform the culture within the medicine and transplant programs by fostering an atmosphere of transparency and trust. In addition to the cultural transformation within these specific programs, news of the project and the impressive results achieved by the project team spread quickly to other program areas; boosting the patient safety movement throughout the hospital.

Overview of the Project

The project began as a pilot on two medicine units, with a high population of diabetic patients, with the implementation of several practice and educational changes (described later). Preliminary results, established through chart audits, from the two initial pilot units indicated that the practice changes decreased errors in insulin administration and increased consistency in insulin therapy practices. Based on these preliminary results, the project was extended to include the remaining eight medicine units and one transplant unit. The changes were piloted for a six-month period (October 2003 – March 2004) and post-implementation chart audits were then conducted for a four-week period.

Background

Clinical nurse leadership within the medicine program were concerned that patient care was being compromised by insulin errors, in many instances stemming from inconsistent processes (e.g., lack of consistent identification of insulin orders as a separate priority within ordering procedures, charting, etc.). To verify the reality of these concerns, an Insulin Project team consisting of 10 core members (including an endocrinologist, clinical nurse specialist – medicine, clinical nurse educator – medicine, quality consultant, pharmacist, dietician, diabetes nurse clinician, clinical supervisor and additional medical and quality representatives) was created with endorsement from the medical and operational program leads.

Team members selected were viewed as experts in the areas of diabetes or quality improvement and/or had an interest in reducing insulin medication errors. The major goal of the team was to enhance diabetic patient safety and well-being within the pilot units at UAH by reducing the incidence of errors related to insulin therapy.

Improvement Methodologies

The project team utilized two different improvement methodologies – first, the Path of Work Flow and, second, the PDSA (Plan, Do, Study, Act) Model – to develop the project plan, determine the direction of the project and facilitate the project process. The main focus of the project was to address the barriers associated with the administration of insulin, rather than actual glycemic control, which was deemed to be beyond the scope of the project.

Project Goal

Appropriate benchmarks for the outcomes to be achieved by the Insulin Project were determined by reference to the Institute for Safe Medication Practices (ISMP) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). Insulin is considered a "high-alert" medication by the ISMP. High-alert medications are drugs that bear a heightened risk of causing significant patient harm when they are used in error. Although mistakes may or may not be more common with these drugs, the consequences of an error with these medications are clearly more devastating to patients (ISMP 2003). While there is no specific target for insulin errors identified in the expert literature, the Insulin Project team believed that the implicit target should be zero errors, based on the seriousness of the issue and the fact that the process should be entirely under effective management control. For this first effort at improvement, the team decided that a realistic working goal would be to reduce actual prevalence for all the targeted processes combined by 50%.

Assessment of Errors

Incident reports. To determine the magnitude of errors associated with adult diabetic patients and insulin therapy, a review of the hospital's incident report data was first undertaken. Given that medication errors are often under-reported (Bates et al. 1995; Brennan et al. 1991; Lawton and Parker 2002; Ricci et al. 2004; Stanhope et al. 1999; Walker and Lowe 1998; Weingart et al. 2000), the results were deemed unreliable. The under-reporting of errors is often attributed to the "blame culture" perceived to exist within the healthcare system. In this case, when questioned, staff on the pilot units readily admitted their reluctance to submit incident reports citing concerns that they would be judged to be an inadequate practitioner and/or held responsible for the incident; demonstrating that a "culture of blame" was perceived by the staff on the pilot units.

However, in order to submit an incident report, one must first recognize that an error has been made. Prior to any changes being made, in order to assess knowledge about diabetes and its management, a questionnaire was administered to nursing staff and medical residents. The findings demonstrated a knowledge gap related to insulin therapy and subsequently identified why the incident report data were unreliable. In many cases,

insulin dose and/or glucometer errors had occurred, yet the individual involved was unaware that an error had been made. As a result, education was identified as an essential component of the Insulin Project.

Chart audits. As incident report data were considered unreliable, baseline measures of diabetes-related errors within the pilot units were established through pre-implementation chart audits. The chart audits encompassed all adult insulin-dependent diabetic patients and were conducted for four weeks in early 2003 (April 4, 2003 – May 1, 2003) on 10 inpatient medicine units. Pre-implementation chart audits were also completed on the transplant unit, prior to any changes being made.

Types of errors captured in the chart audits included glucometer reading (chemstrip) errors (too early, too late, missing, inappropriate extra reading), insulin timing errors (too early, too late), incorrect insulin doses (too high, too low, extra, missed), incorrect type of administered insulin (wrong insulin), transcription errors and errors with written orders (illegible, incomplete). In addition, inconsistent insulin administration times for patients receiving enteral feeding and variable physician ordering practices were identified through the audits.

Post-implementation chart audits were conducted for a four-week period in 2004 (April 4, 2004 – May 1, 2004) on the 11 pilot units. These audits proved to be a reliable method for assessing the impact of the changes on the rate of diabetic-related errors, and selecting one individual (clinical nurse educator) to perform the audits ensured consistency of measures. The same audit tool was utilized in the pre- and post-implementation chart audits to ensure results were comparable.

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Practice and Educational Changes

Before large-scale changes could be implemented in blood glucose management, the basic procedural steps in diabetes patient care needed improvement to provide a standardized and systematic approach. To identify these steps, a detailed flow chart was completed that identified a number of inconsistent practices with regards to insulin therapy; for instance, forms were located in various sections of the patient care record creating inefficiencies. There was an absence of pre-printed forms, which created opportunities for errors during transcription. As well, the practice of faxing insulin orders to the hospital pharmacy for review by the pharmacists had declined.

Upon completion of the flow chart, several multidisciplinary practice and educational changes were implemented:

- developing a decision algorithm for insulin dosing
- educating the clinical pharmacists in the decision algorithm for insulin dosing
- changing the format of the pre-printed intravenous insulin orders
- designing a pre-printed sliding scale insulin order form
- reinforcing the practice of faxing insulin orders to pharmacy for clinical pharmacists to review
- revising the insulin/blood glucose monitoring record
- placing the insulin and insulin/blood glucose monitoring records in a separate section of the patient care record
- developing guidelines for insulin administration for diabetic patients receiving tube feeds
- developing a Web site for physicians to access guidelines for insulin therapy in order to standardize treatment
- incorporating diabetes and insulin education into physicians' rounds and nursing education

Several forms were created and/or revised over the course of the project to increase knowledge and to reduce diabetes-related errors. In particular, the decision algorithm was designed for use as a quick reference or as a basic template for appropriate insulin dosing, and as an education tool for nursing staff, physicians, nurse practitioners and pharmacists.

Along with the practice changes, several educational initiatives were implemented. Medical residents attended a half-day educational session on management of diabetes and "Suggestions for In-Hospital Management of Patients with Diabetes" were posted on the Division of Endocrinology Web site. Education on diabetes was also added to the medicine orientation for new nursing staff and 17 additional one-hour inservices were held with a total of 115 staff from the pilot units attending.

Results

There have been substantial improvements in care associated with adult insulin-dependent diabetic patients admitted to the pilot units at UAH. Error reductions have improved patient safety and enhanced the quality of diabetic patient care through the application of a standardized and consistent process for ordering and administering insulin. Errors were reduced by 22 – 94% depending on the type of error. These outcomes cumulatively met the 50% reduction target in the prevalence of diabetic-related errors in the pilot units. More importantly, the most promising improvements occurred in the attitudes and perceptions of the staff and physicians towards errors and patient safety; an indication of a cultural shift.

Organizational Culture Measures

A range of organizational culture measurement tools exists in the literature however, there appears to be little agreement on which of these instruments accurately measures organizational culture (Gershon et al. 2004; Scott et al. 2003). Therefore, the project team decided to approach the assessment of organizational culture through the use of proxy measures. These proxy measures included subsequent changes observed through the use of communication boards, feedback from the staff survey and an examination of the narrative portion of the incident report forms.

Communication board. A communication board was initiated on each of the pilot units to allow staff to provide feedback on the practice changes as they occurred during the implementation phase of the project. The communication boards were heavily utilized and proved to be a powerful education tool. Receptiveness and responsiveness of team members to staff questions/comments helped to cultivate knowledge of insulin therapy and diabetes management, and helped to build trust and transparency within the pilot units.

Units that emphasize good information flow will have a shaping influence, particularly on patient safety (Westrum 2004). The free flow of information between project team members and staff via the communication boards heightened staff members' awareness of the project and kept them informed about the changes that were occurring and why. Staff realized early on that some of the changes introduced were in direct response to their feedback. As a result, staff felt empowered to speak up and to become active participants in the project. Staff viewed the project as an opportunity to improve patient care processes; an opportunity they did not feel existed prior to its initiation.

Another improvement related to the communication boards and dialogue exchange was increased verbal reporting of diabetic-related near misses. Staff members had an increased awareness of unsafe practices and were empowered to alert others such that process or system changes promoting patient safety could be developed. Not only did staff report near misses, they cited contributing factors and recommended possible changes, thereby averting the potential for subsequent incidents. This behavioural change represented a marked departure from that which occurred prior to the project (i.e., when near misses were not acted on); an indication of a shift towards a "culture of safety."

Surveys. Feedback was obtained from staff to determine if the changes improved the care of hospitalized patients with diabetes. Surveys were conducted for a three-week period on the 11 pilot units with nursing staff, unit clerks, staff physicians, medical residents and pharmacists. Surveys were also mailed to UAH staff physicians who attended patients on the units for endocrinology, general internal medicine, hematology, nephrology and pulmonary medicine.

There were 189 survey responses returned (142 hospital staff, 26 medical residents and 21 attending physicians). Survey results showed an overwhelming positive response (>90%) to permanently implement the following changes:

- separate section of chart for insulin orders
- different coloured paper for insulin orders
- glucometer readings performed 30 minutes prior to insulin administration
- insulin sliding scale template

Attending physicians responded favourably to the changes with such survey comments as "this is a very good project and improved patient safety," and "having the pertinent information...is essential to help eliminate errors and improve decision making – better quality of care."

Cumulative responses to three specific survey questions were also positive; an indication of the culture shift. There were 56% (105/189) of respondents who agreed/strongly agreed that the changes implemented as part of the project had improved patient care. As well, 44% (83/189) of respondents agreed/strongly agreed that there had been fewer errors related to diabetes management during the project. Finally, 43% (82/189) of respondents felt that the education provided had improved staff knowledge of diabetes management. There was a highly positive response (>85%) to permanently implement several recommendations (new glycemic record, insulin drip protocol, complete physician orders).

Incident reports. Incident reports for the periods April 4 – May, 1, 2003 and April 4 – May 1, 2004 were reviewed. While the number of diabetes-related incident reports filed did not differ dramatically during the pre- and post-implementation phases of the project, the type of incidents reported did. For example, a 2004 incident was reported because one extra unit of insulin (six units instead of five) was administered. Another report was filed because the insulin and chemstrip had not been charted appropriately in the patient care record. These types of incidents were a sharp contrast from what had been reported in 2003, which tended to focus on outdated orders being used for insulin dosing; errors which could have serious ramifications for any diabetic patient. This finding echoed previous research results, which revealed that only serious errors in healthcare are likely to be reported (i.e., when a patient has been injured; when willful violation of established protocol has occurred, etc.) (Lawton and Parker 2002; Ricci et al. 2004; Stanhope et al. 1999). Clearly, there is more work to be done to further improve incident reporting. However, the disparities in the types of incidents reported between the two time periods represent both the learning that has been achieved and the culture shift that occurred as a result of this project. The team remains optimistic that incident reporting will continue to improve with increased

staff recognition of the value of completing incident reports, the associated learning that comes from reporting, and the implementation of a new Web-based incident reporting system (netSAFE) throughout the Capital Health region.

To encourage incident reporting throughout the region, Capital Health has recently approved a Just Culture (non-punitive) policy. This policy was drafted in response to a recommendation put forth by the NSCPS in their 2002 publication, "Building a Safer System: A National Integrated Strategy for Improving Patient Safety in Canadian Healthcare," that healthcare organizations develop an atmosphere of safety and trust in order to enhance the reporting and identification of incidents or near misses. This recommendation was echoed by the CCHSA with the release of its 2005 Patient Safety Goals and Required Organizational Practices (CCHSA 2004). Developing organizational cultures of safety that emphasize trust and transparency will help to resolve the issue of under-reporting currently plaguing many healthcare organizations.

Role of Leadership

Strong leadership support at all levels has been essential throughout the development, implementation and completion phases of this project. Senior leadership at UAH enthusiastically adopted all of the recommendations put forth by the project team for site-wide implementation. Leadership support is necessary for culture change (CCHSE 2005; Weingart and Page 2004; Westrum 2004) and to mitigate errors in healthcare. Further, healthcare executives are well-positioned to shape the culture of safety through commitment to quality improvement projects such as this one. The decision to implement all of the recommendations site-wide communicated a powerful message to the team and others about UAH leadership's commitment to patient safety. It is through this commitment to quality and safety that the UAH is transitioning toward Westrum's generative organization.

Conclusion

The Insulin Project has demonstrated extremely positive results in the management of in-hospital adult patients requiring insulin, but also in the broader potential to redesign processes to improve quality and safety. The practice changes and associated education implemented by the project team resulted in substantial decreases in the number of clinical errors. The application of a standardized and consistent process for ordering and administering insulin improved diabetic patient safety within the pilot units at UAH, and the process developed during this project is indeed transferable to other areas both within and possibly outside the hospital. The success of the Insulin Project, dissemination of results and commitment of leadership have helped to "fire" the enthusiasm for patient safety and quality improvement at UAH, and, most importantly, launch a shift in culture from that of blame to safety.

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