Improving Safety Management at the Sharp-End:

A Plan for Integrating Safety Action Teams in the Calgary Health Region

Author: Carmella Duchscherer
MPA Candidate,
University of Victoria

Client: Glenn McRae
Director, Quality, Safety & Accreditation,
Calgary Health Region

Supervisor: Dr. Evert Lindquist
Director, School of Public Administration,
University of Victoria

Second Reader: Dr. Rebecca Warburton
Associate Professor, School of Public Administration,
University of Victoria

Date: December 17, 2008

ACKNOWLEDGEMENTS

This project has been an incredible learning opportunity for me. I feel very fortunate that my final graduate work was on a topic that I am very passionate about. There are a number of individuals I am indebted to.

I would like to thank Glenn McRae. As a client, you gave me the opportunity to study something that is near and dear to my heart. As a boss, you gave me support, advice, and even a deadline when I needed an extra push.

I would also like to thank the Safety Action Team members who participated in the interviews. Your honesty and trust allowed me to gain a much deeper understanding of how things are currently working and where improvements can be made. Your enthusiasm for the safety improvement work you are committed to is encouraging!

I feel indebted to my supervisor, Dr. Evert Lindquist. You were always pushing me to think differently, strive further, and to aim for a high-quality report that I am now very proud of. I would also like to thank both my second reader, Dr. Rebecca Warburton, and the chair of my examination committee, Dr. Herman Bakvis, for your time and your flexibility that allowed my defense to be held with minimal notice.

I would like to thank the individuals who took the time to read through various drafts and to provide me with feedback. I am particularly indebted to Dr. Jan Davies and Dr. Cathie Scott. I appreciate that as busy professionals you found the time to carefully read my paper and provide your thoughtful, expert advice.

Last (but not least), I want to thank my family and friends who have supported me through not only this project but through my entire graduate work. I will be forever grateful to my husband, Greg, for his faith in me, continual support, and endless encouragement. Thank you.

EXECUTIVE SUMMARY

This is a 598 Advanced Management Report prepared for the Health Outcomes portfolio of the Calgary Health Region by a Master's of Public Administration (MPA) candidate at the University of Victoria, British Columbia. The report is presented for consideration by the client of this project, the Director of Quality, Safety & Accreditation. The purpose of this project is to analyze the Safety Action Teams and to present recommendations to better support the teams and integrate their activities with other quality and safety management initiatives in the Calgary Health Region.

After the unexpected death of two patients in 2004, the Calgary Health Region has embarked on a remarkable patient safety journey. The organization's leadership has focused on fostering the development of an organizational safety culture, and numerous patient safety initiatives have been undertaken. Safety Action Teams (SATs) are one such initiative. Working at their local level, SATs make improvements to patient safety by engaging staff to identify and fix safety issues within their local environment. Numerous improvements have resulted at a local level from the work of these teams. However, there are no structures and processes within the Calgary Health Region to connect the teams to each other and to organization-wide safety work. This means that individual SATs work predominantly in isolation, do not share information about patient safety hazards, and cannot tie into larger quality and safety management activities at the Regional level.

For this study, a qualitative methodology was chosen. Members of SATs were recruited to participate in interviews. A two-phase literature review was conducted. The findings from the literature review and the results of the interviews were combined to develop a conceptual framework detailing the factors that influence SAT function.

The conceptual framework depicts factors at three levels: the clinical microsystem (local level), the organizational level (the Calgary Health Region), and external to the organization. Several factors were identified as being drivers and assets that support SAT function, or as challenges and barriers that limit or impede SAT function. The elements of culture, sub-culture, and climate were also recognized as influencers. The various factors and cultural elements were displayed pictorially in a conceptual framework.

Safety Action Teams have a wealth of information about safety at their local level, including where the safety deficiencies lie and ideas on how they can be addressed. However, currently in the Calgary Health Region information flow to and from SATs is halted because of an absence of an adequate social network. This means important safety information is left and lost at the local level and large organization-wide safety initiatives are not communicated to SATs at the local level.

Because of this gap this report argues that the Calgary Health Region needs to develop an enabling social network to better support and integrate the work of SATs. A social

network would include connections among teams and others internal and external to the organization, along with communication channels for information exchange. The resulting relationships could foster the sharing of safety information and provide access to resources and support to SATs from leadership and quality and safety experts.

A three-pronged social network approach is recommended, focusing on establishing 'weak ties' to facilitate acquisition of *new* information and ideas. The three-prongs include creating linking networks, establishing bridging networks, and strengthening the roles currently functioning across the structural holes of the network. Within each of these elements, different options were discussed, analyzed according to specific criteria, and a final approach is recommended for each element. To establish linking connections for the access of support and resources, SATs should connect with existing Quality Improvement Councils. Staff within the Health Outcomes portfolio, including Quality Improvement Consultants and Clinical Safety Leaders, already function across the structural holes, and are ideal for bringing new ideas, information, and support to teams. For the third element, a hybrid approach relying on technology-enabled and face-to-face connections is recommended to create bridging networks among various SATs.

An implementation plan is presented detailing specific activities, sequencing, and accountability. In this plan implementing the recommendations would take three quarters. Implementation strategies aimed at addressing the factors identified in the conceptual framework are presented, including: leadership and management engagement; access to quality and safety experts; information and performance management; and education and training. Evaluation as part of the implementation plan is also recommended. Feedback and evaluation on specific recommendations and strategies should be gathered throughout the implementation process. An over-all evaluation of SATs should be done after full implementation, focused on measuring: information exchange among SATs across the Region; SAT members perception of support; and integration of SAT activities and regional safety initiatives. The safety culture survey should continue to be conducted across the Region on a biennial basis.

By using a social network approach and strengthening it with the implementation strategies, an adequate social network structure may be established in the Calgary Health Region to better support the SATs and to integrate their activities with the work of other teams and with Region-level safety initiatives.

TABLE OF CONTENTS

INTRODUCTION 1

BACKGROUND 3

Patient Safety Movement in Canada and Alberta: An Overview 3
Calgary Health Region: From Tragedy to Improved Practice 4
Safety Action Team Concept: From Minnesota to Calgary 6
Summary 7

METHODS AND DELIVERABLES 9

Primary Data Collection and Analysis 9
Secondary Data Collection and Analysis 10
Potential Strengths and Weaknesses of the Methods 10

SHIFTING ORGANIZATIONAL CULTURE: A LITERATURE REVIEW 12

Culture 12
Subculture 13
Safety Culture 14
Culture versus Climate 16
Cultural Formation and Evolution 17
Leadership's Role in Influencing Culture 18
Subjective and Objective Responsibility 20
Summary 20

UNDERSTANDING SOCIAL NETWORKS AND CLINICAL MICROSYSTEMS: A LITERATURE REVIEW 21

Clinical Microsystems 21

SOCIAL CAPITAL, NETWORKS, AND WEAVING 22
Social Capital and Social Networks *22*
Network Maps *23*
SUMMARY 27
FINDINGS 28
SAT DEMOGRAPHICS AND FUNCTION 28
SAT ACTIVITIES 29
SAT SUPPORT AND INTEGRATION 31
SUMMARY 32
CONCEPTUAL FRAMEWORK 33
DISCUSSION 37
OPTIONS AND RECOMMENDATIONS 40
BRIDGING NETWORKS 40
Option 1a: Technology-enabled connections *40*
Option 1b: Face-to-face connections *41*
Option 1c: Hybrid *41*
ROLES ACROSS STRUCTURAL HOLES 41
Option 2a: Health Outcomes Portfolio *41*
Option 2b: Clinical positions *42*
LINKING NETWORKS 42
Option 3a: Operational committees *42*
Option 3b: Clinical safety committees *42*
Option 3c: Quality improvement councils *43*
CRITERIA FOR EVALUATING OPTIONS 43
RECOMMENDATIONS 49
Bridging Networks *49*
Roles Across Structural Holes *49*
Linking Networks *50*
SUMMARY 50

IMPLEMENTATION STRATEGIES....................................51

PLANNING AND MANAGING IMPLEMENTATION...51

ADDRESSING CONCEPTUAL FRAMEWORK FACTORS...52

Leadership and Management Engagement...52
Access to Quality and Safety Expertise...52
Information and Performance Measurement..53
Education and Training...53
EVALUATION...55

SUMMARY..57

CONCLUSION: SUPPORTING AND INTEGRATING SATS 58

REFERENCES 60

APPENDIX 'A' - CALGARY HEALTH REGION ORGANIZATIONAL STRUCTURE 2008..............................65

APPENDIX 'B' - REQUEST TO PARTICIPATE..................66

APPENDIX 'C' – CONSENT FORM......................................67

APPENDIX 'D' – INTERVIEW QUESTIONS......................68

INTRODUCTION

Front-line workers are those workers at the ‘sharp end’ of an organization, where their actions and inactions have almost immediate results. These results can be either positive or negative. Within the health system, healthcare professionals who provide care to patients are similarly at the ‘sharp end’. As a consequence of actions or inactions of these workers, patients can be exposed to hazardous situations, and as a result, may suffer harm (Reason, 1990; Reason, 1995; Reason, 2005). However, this focus on the ‘sharp end’, although historically based, is at odds with the more recently adopted systems approach to safety. This systems approach recognizes that decisions made by leaders at the ‘blunt end’ create the conditions in which healthcare providers work in at the ‘sharp end’ (Reason, 1990).

Although adverse events[1] have always occurred in the provision of care, the safety of patients has only emerged as a major health policy issue within the past decade. With this new emphasis, many healthcare organizations have embarked on initiatives aimed at improving the safety and quality of patient care. One such organization is the Calgary Health Region (the ‘Region’), which has launched numerous safety initiatives over the past ten years. The focus of this paper will be on the analysis of one of these initiatives – the introduction of Safety Action Teams (SATs).

Across the organization, SATs have been established in a variety of locations. The concept behind SATs is that empowering front-line staff to make changes to the structures and care processes in their local work environment will lead to improvements in patient safety at the ‘sharp end’ of care delivery.

Although many SATs have made significant improvements to patient safety at a local level, the author and client believe that the learning and improvements accomplished at the local level are not being sustained or spread within the organization. There is variability in performance among teams, with some teams being less effective than others in making changes. As well, because of a lack of formal structure and processes to link the SATs together, the teams carry out their work in isolation. Furthermore, due to the local nature of the SAT work, the activities of the teams are not well integrated or aligned with other organizational safety and quality improvement initiatives. While the concept of SATs is a good one, it is likely that the teams in the Calgary Health Region have not had the sustained impact on patient safety as was envisaged.

[1] The term ‘adverse event’ has been used in the literature to mean different things. In this paper, the term will be used to refer to the negative outcome – harm – that a patient experiences as a direct result of the healthcare received. Within the Calgary Health Region, harm has been defined as “an unexpected or normally avoidable outcome that negatively affects a patient’s health and/or quality of life, and occurs or has occurred during the course of receiving health care or services from the Region” (Calgary Health Region, 2006).

The author and the client of this project thought there was an opportunity to make improvements to Safety Action Teams in the Calgary Health Region. Thus, an MPA 598 Project was undertaken. The purpose of this project was to conduct an analysis of Safety Action Teams and to present recommendations on how to better support the teams in their local improvement work and to integrate their activities with the work of other SATs as well as with other related organizational initiatives.

In this report, the author will present the project, starting with a background discussion on the patient safety movement, the Calgary Health Region's quality and safety journey, and the concept of Safety Action Teams. The project methodology will then be explained. The results of the literature review (secondary data collection) and the findings of the interviews (primary data collection) will be described, followed by a description of the conceptual framework and discussion. Lastly, options, recommendations, and implementation strategies will be provided. By using a network- based approach, the Calgary Health Region will be able to build the required community, social network and information channels to capitalize on the SATs as an initiative to enhance patient safety at the 'sharp end' of care delivery.

BACKGROUND

All too often patients are harmed by the care they receive, the very care they sought to alleviate their symptoms or to heal their conditions. Patients, the public, media, and healthcare providers are all demanding that healthcare organizations and governments make care better and safer. Many healthcare organizations have undertaken initiatives to do so. Some of these initiatives have been more successful than others in making care safe and in shifting the organizational culture to one where safety is a priority.

This section provides three areas of background information. First, is a discussion of general information about the issue of patient safety and the history of the patient safety movement in Alberta and Canada. Following this is an organizational description of the Calgary Health Region. Lastly, the concept of Safety Action Teams will be discussed.

Patient Safety Movement in Canada and Alberta: An Overview

Patient safety has become a major health policy issue during the last decade. The publication of numerous patient safety-related studies, coupled with national and international campaigns and calls to action, has resulted in increased public and healthcare provider awareness about the issue of patient safety. In the report *To Err is Human: Building a Safer Healthcare System*, the Institute of Medicine (2000) brought the issue of patient safety to public attention with an extrapolation of findings from three retrospective chart studies estimating that between 44,000 and 98,000 patients die every year in American hospitals as a result of "preventable medical errors". In Canada, Dr. Ross Baker and colleagues received extensive media coverage when they released the results of the Canadian Adverse Events Study, which estimated that 7.5% of patients admitted to a Canadian hospital experienced an adverse event (Baker et al., 2004). Beyond North America, studies in the United Kingdom and New Zealand have demonstrated similar rates of adverse events (Institute of Medicine, 2000; Baker et al., 2004). In a telephone survey conducted by the Health Quality Council of Alberta, 37% of respondents reported that they or a family member had experienced a "preventable medical error" while receiving healthcare services (Vanderheyden et al., 2005). These studies have not only quantified the magnitude of patient harm events but have also shone the spotlight on the issue of patient safety, catalyzing numerous improvement efforts across many healthcare organizations.

Changes in healthcare governance and establishment of non-profit organizations dedicated to patient safety have occurred in Canada as a result of this increased awareness and importance put on patient safety. In 2002, the National Steering Committee on Patient Safety released its report outlining a national strategy for improving the safety of patient care in Canada (National Steering Committee on Patient Safety, 2002). The report included 19 recommendations, divided into five main categories:

1. establish a Canadian Patient Safety Institute to facilitate a national integrated strategy for improving patient safety;
2. improve legal and regulatory processes;
3. improve measurement and evaluation processes;
4. establish educational and professional development programs; and
5. improve information and communication processes.

A year after the release of this report, the Canadian Patient Safety Institute (CPSI) was established with funding from Health Canada. The CPSI was to operate as a non-profit, independent organization to deliver on its "national mandate to build and advance a safer health system for Canadians" (Canadian Patient Safety Institute, 2005).

Another example of change related to the increased focus on patient safety is that of the changes in accreditation standards. Since 2006, Accreditation Canada has incorporated Patient Safety Goals and Required Organizational Practices as part of the accreditation process (Accreditation Canada, 2008). This means that there are specific mandatory practices for all organizations undergoing accreditation. Failure to meet any of these Required Organization Practices will prevent an organization from receiving accreditation.

In 2004 the Alberta Government gave the Health Services Utilization and Outcomes Commission a larger mandate - clearly focused on quality and safety. To reflect this new mandate, the Commission was renamed the Health Quality Council of Alberta (HQCA). The HQCA was established as an independent organization under the Regional Health Authorities Act, with the purpose of promoting patient safety and quality improvement throughout the province (Health Quality Council of Alberta, 2008).

While patient safety it is not a new issue, with decades of data indicating that our ability to provide safe care has been in question for some time, only recently has patient safety penetrated public and organizational awareness. With this awareness, we are now just beginning to use patient safety as a reason to change the way we deliver healthcare.

Calgary Health Region: From Tragedy to Improved Practice

The Calgary Health Region, as one of nine health authorities in Alberta, reports to the provincial government through Alberta Health and Wellness, and receives its mandate through the Regional Health Authorities Act (Alberta Health & Wellness, 2007). The Region is one of the largest, fully-integrated healthcare systems in Canada (Calgary Health Region, 2008). With an annual budget of $2.8 billion, the Region provides community, public health, and primary care health services to a population of 1.2 million people and tertiary-level acute care to 1.6 million people. Healthcare services are provided in over 100 locations spanning 39,260 square kilometers by more than 29,000 employees and 2300 physicians (Calgary Health Region, n.d.).

In 2004, a tragic event occurred in the Calgary Health Region in which two patients died as a result of a complex combination of contributory factors. During the preparation of a dialysis solution in the Central Pharmacy, potassium chloride was inadvertently added

instead of sodium chloride. Two patients, who were requiring a specialized form of dialysis while they were in Intensive Care, received the erroneously constituted solution. As a result, they developed severe hyperkalemia, suffered cardiac arrests, and despite resuscitation, both died. After disclosing the details to the families, the Region informed the public and other healthcare organizations of these events.

Numerous changes have been made in the Region as a result of this tragedy. Three safety analyses (one internal and two external) were conducted to identify contributing factors. The Region accepted all of the 121 unique recommendations from the reviews. These recommendations addressed specific medication administration issues and more general aspects about the organization and its safety culture. The implementation of these recommendations has resulted in numerous structural and process level changes throughout the Region. For example, a safety framework was developed that includes a safety management cycle at its core, supported by four cornerstones- organizational structure, leadership and accountability, resources, and a culture of safety (Flemons, Eagle & Davis, 2005). A new executive position, Vice-President of Quality and Safety, was created, and the existing Quality Improvement and Health Information (QIHI) department became a new portfolio, Quality Safety and Health Information (QSHI). This new portfolio included a unit and resources, financial and human, dedicated to clinical safety. The Clinical Safety Evaluation (CSE) unit was able to support operational leaders in meeting their accountabilities for patient safety by using the CSE-dedicated resources to create structure, standardize processes, and offer support for safety and quality assurance activities. The creation of a permanent clinical safety committee infrastructure, coupled with a standardized and system-focused process for conducting safety analyses, is one example of CSE's enabling work.

In response to the recommendations asking the Region to commit to establishing a safety culture, the Region developed four safety policies (*Reporting Harm, Close Calls, and Hazards; Disclosing Harm to Patients; Just and Trusting Culture of Safety;* and *Informing Principal Health Partners about Safety Hazards, Failures, and Fixes*), four accompanying procedures, and a guideline for the *Immediate and Continuing Management of Serious (Potential) Adverse Events*. As well, the paper-based incident report form was replaced by an electronic safety learning reporting system, a change intended to better support learning across the organization and foster a safety culture.

Before the deaths in 2004, quality and safety management efforts had been predominantly focused on quality improvement initiatives. QIHI, the predecessor to QSHI, had been established in 2000 from an accreditation recommendation. The creation of QIHI had sought to centralize quality improvement and measurement / evaluation resources, predominantly to support clinical department-based quality improvement efforts. Between 2002 and 2005, QIHI led organization-wide collaboratives aimed at improving the quality of different aspects of patient care. Collaboratives were seen as a way to achieve larger, system changes by having a number of teams across the organization working on similar themes. The collaboratives enjoyed modest success as individual teams piloted a number of local initiatives that resulted in improved performance. However, collaboratives typically failed to sustain these changes locally or to spread

these changes to other areas in the organization. The response of the Region's leadership to the two deaths in 2004 was the catalyst that enabled the Region to review its approach to quality and safety, to make changes to its quality infrastructure, and to incorporate a greater focus on patient safety.

In December 2007, the President and CEO of the Region announced a massive re-organization, effective in early 2008 (Appendix A depicts a high-level organizational structure). Its stated purpose was to allow a stronger focus on clinical priorities and outcomes by flattening the organizational hierarchy, to place a greater emphasis on measurement, and to better align clinical service delivery. As a result of this re-organization, QSHI was revamped to become the Health Outcomes portfolio. Although some of the core units of health information, quality improvement, accreditation, and safety still existed, some of QSHI's units were moved under other leadership while some new areas were added. As well, the Clinical Safety Committee structure was revised and the clinical portfolio level safety resources were re-aligned to reflect the new organizational structure.

While the Calgary Health Region was implementing this new organizational structure, the Alberta government announced in April 2008 that it would implement numerous changes to reform the provincial healthcare system in order to improve access, efficiency, and effectiveness (Government of Alberta, 2008). The most significant change, announced on May 15 2008, involved establishing one provincial governance board to replace the nine health authority boards, the Alberta Mental Health Board, Alberta Cancer Board, and Alberta Alcohol and Drug Abuse Commission (Alberta Health & Wellness, 2008). The new Alberta Health Services Board is now responsible for all health service delivery across the province. The previously autonomous organizations will transition into a single health authority in April 2009. Although it is unknown at this point what changes will result from the new governance model, it is likely that there will be some changes made to the structures and processes of quality and safety management.

Safety Action Team Concept: From Minnesota to Calgary

The Region has not been alone in its safety endeavors. Many other organizations have embarked on similar journeys. In 1990, the Children's Hospitals and Clinics of Minnesota started its own safety transformation. The focus was on involving direct healthcare providers and leadership in this transformation.

The Children's Hospitals and Clinics of Minnesota developed the concept of Safety Action Teams (SATs). This concept is based on the belief that engaging direct care providers - those working at the sharp end - is critical to the success of any patient safety activity. SATs are "department- or unit-based interdisciplinary work groups that provide a 'think tank' for staff to identify safety concerns, process them, and brainstorm new ways to address them" (Hooke, 2002, p. 59). Morath and Leary (2004) describe SATs as interdisciplinary, front-line teams charged with continually assessing patient safety and making improvements at their local level. The establishment of SATs helps improve patient safety in two ways. First, and most obviously, safety problems are analyzed and fixes are implemented. Secondly, the organization's safety culture is enhanced through

the greater engagement and empowerment of front-line staff to address safety issues. SATs follow three simple rules: "Fix what you can. Tell what you fixed. Find someone to fix what you cannot." (Morath & Turnbull, 2005, p. 167). At the Children's Hospitals and Clinics of Minnesota, the Office of Patient Safety (OOPS) supports the work of SATs, and manages information about patient safety through receipt of safety learning reports and the results of safety analyses (Morath & Leary, 2004). Safety Action Teams use the information from the safety learning reporting system to identify hazards and to inform improvement work.

The concept of SATs was brought to the Calgary Health Region in 2004, following a presentation at a patient safety symposium by Minnesota Children's Hospital's Chief Operation Officer, Julianne Morath. With initial assistance from Quality Improvement Consultants and later from Clinical Safety Leaders, SATs were established in some areas of the Region. Teams were set up in areas where there was strong interest and where Quality Improvement and Clinical Safety Evaluation staff were aware of the concept and able to assist. Consistent with SATs in Minnesota, the teams were led by front-line staff and were charged with identifying, fixing, and communicating about safety hazards on their unit. Management's role was to create opportunities for teams to exist and to remove barriers standing in the way of SATs making local fixes. Management would typically only attend meetings at the request of the SAT. The SAT concept has proven valuable, increasing the awareness of safety, empowering staff, and resulting in many valuable safety improvements at a local level.

There are, however, significant differences between the Calgary Health Region and Children's Hospitals and Clinics of Minnesota. First, the Minnesota organization is much smaller, based at two sites, and has tight links between operations, the Safety Action Teams, and OOPS. In contrast, the Region is a much larger organization, and has no formal ties between the SATs and the CSE unit. Second, teams in Minnesota meet regularly to showcase their safety improvement work and to receive recognition for their efforts, whereas in Calgary it has been impossible to determine where teams existed, let alone have teams meet each other and be rewarded. The lack of supporting structure and processes in Calgary means that most safety lessons remain embedded at the local level, and are not shared and spread across the Region. Members of SATs do not hear about larger, system-wide changes that are being implemented. The work of the Region's SATs was intended to support the development of a safer organizational culture through the engagement of direct care providers in making local safety improvements. However, the lack of a formal infrastructure for SATs has hindered the acquisition and sharing of safety learning within the Region, limited the level of support for the teams, and has prevented rewarding and recognizing staff beyond the department level.

Summary

While the issue of the safety of patients has undoubtedly existed since the beginning of healthcare ("First, do no harm"), this issue has not received widespread recognition by healthcare providers, governments, or the public until the last decade. In the last five years, major changes in the 'healthcare safety' movement have occurred in Canada and in

Alberta, with the establishment of non-governmental bodies dedicated to patient safety and quality improvement. Within the Calgary Health Region, two fatal adverse events in 2004 became the impetus for significant changes in the organization's safety management.

One of the many safety initiatives that have been since implemented in the Region is that of Safety Action Teams, a concept adapted from Minnesota that is aimed at making improvements to safety at the local level and supporting cultural change. While many of the teams have made improvements at their local level, the lack of infrastructure has meant that safety information has been almost completely isolated. The lack of Regional infrastructure for SATs suggests that improvements could be made to better integrate the work of the Safety Action Teams within the Region and to better support and mentor the teams. This is the focus of this MPA 598 project, and in the next section, the project's methodology and deliverables will be presented.

METHODS AND DELIVERABLES

The purpose of this project is to conduct an analysis of Safety Action Teams and to present recommendations on how to better support the teams and integrate their activities. Three main phases of the research were established to achieve the project goal.

1. *Establish the current state.* The goal of this phase was to determine how SATs are currently functioning within the organization. This was accomplished by interviewing members of SATs.

2. *Determine the drivers/ supports/ assets and challenges/ barriers.* The goal was to perform an analysis of the opposing forces influencing the structure, process, and outcome of the SATs. The aim was to answer two questions: i) What factors drive the SATs, and what resources exist to support them?; and ii) What factors act as challenges and barriers to SAT function and output? Findings from the literature review and interviews were used to answer these two questions.

3. *Propose future possibilities.* The overall goal of this project was to propose recommendations and options for the client as how to better support the SATs and integrate the activities of the teams with other quality and safety management activities. This was accomplished through analysis of the findings and development of a conceptual framework.

The key deliverables to be provided to the client included findings from a literature review; analysis and presentation of results of conducting interviews with SAT members; development of a conceptual framework; and lastly, presenting recommendations and options for integration of SATs. In order to meet the deliverables, both primary and secondary data collection was necessary.

Primary Data Collection and Analysis

Primary research took the form of qualitative interviews with members of Safety Action Teams. Participants were recruited to participate in the interviews. Since there was no information on the number or location of SATs in the Region, a nonprobablility sampling design was utilized. First, convenience sampling was used to identify potential participants. Clinical Safety Leaders and Quality Improvement Consultants were requested to name the Safety Action Teams they knew of in their area. Second, a snow-ball approach was used during interviews to identify as many additional teams as possible. Participants were asked if they were aware of the existence of other SATS, and if so to identify the area and a member of the team.

Potential participants were recruited primarily through an email invitation (see Appendix B). Because some participants did not use their Regional email account, they were contacted by telephone. All participants reviewed and signed a consent form (see Appendix C), and both the participant and the investigator kept a copy of the form. The

investigator attempted to interview individuals in a variety of roles, such as lead / co-lead, member, and manager. In order to gather as much information as possible, effort was made to include individuals from new and old teams, as well as individuals from teams which had disbanded. Since the total number of SATs was unknown, the goal was to recruit participants from twelve teams.

In-person, semi-structured interviews were used to gather information (see Appendix D). At the start of the interview, questions were specific to team demographics and function. Next, the participant was asked about his or her specific SAT activities, such as how safety issues are identified, how fixes are made, and how fixes are communicated to others in the same area. Examples of safety improvement work were also collected. Participants were asked for their suggestions on how to better integrate and support the work of the teams.

A phenomenological analysis was done on the information gathered from the interviews. Notes from the interviews were read, significant statements were extracted, meanings formulated, and statements were placed into categorical themes. Finally, the findings were then integrated into a description of SAT function in the Calgary Health Region.

Secondary Data Collection and Analysis

Secondary data collection on this project entailed a detailed literature review in two phases. A preliminary review involved scanning the literature on the areas of patient safety, organizational culture / safety culture, and the concept of safety action teams. The literature review started with these topics because they were felt to be directly applicable to the project.

When the importance of a social structure for facilitating sharing of information between the SATs was recognized, the literature review was expanded. This expansion involved inclusion of the topics of social capital, networks, and weaving; as well as clinical micro-systems. Finally, the concepts of subjective and objective responsibility were also explored as to how this could impact an individual's engagement in patient safety and quality improvement activities at the local level.

Potential Strengths and Weaknesses of the Methods

Since no previous work had been done on SATs in the Calgary Health Region, a qualitative approach was determined to be the most appropriate approach for meeting the goals and deliverables of the project. This approach allowed for the modification of questions to ensure that as much information as possible could be gathered about the function of safety action teams. The use of open-ended questions provides richer data for the questions specific to support needs because the investigator is able to ask participants their opinions about different options, as well as request participants to provide additional explanations. The subjective views of participants were critical to understanding how the SATs are functioning and how various factors influence their function and outcomes.

A few limitations of this study were identified:

1. The use of nonprobablility sampling means that it is impossible to determine how representative the sample is, and as such, the potential for selection bias cannot be eliminated. As well, statistical analysis cannot be performed on the data. Due to the absence of information on the numbers and location of SATs, nonprobablility sampling is thought to be a useful and appropriate method for this study.

2. Only one member of each SAT was interviewed for all but one team. Therefore the information gathered about a specific team represents the perspective of one individual only. This limited point of view has an obvious risk to both internal and external validity. However, the alternative, interviewing two or more members from each team, would have required more interviews to include the experiences of the same number of teams.

3. Only one data gathering method was used to gather information about the SATs. One-on-one interviews were used rather than focus groups for reasons of confidentiality. Use of personal interviews helped provide a safe environment for participants to share openly their thoughts and concerns.

Despite these limitations, the methodology undertaken is thought to be appropriate for gaining a better understanding of how the Safety Action Teams are currently functioning in the Calgary Health Region, and for developing a conceptual framework and recommendations for the client.

SHIFTING ORGANIZATIONAL CULTURE: A LITERATURE REVIEW

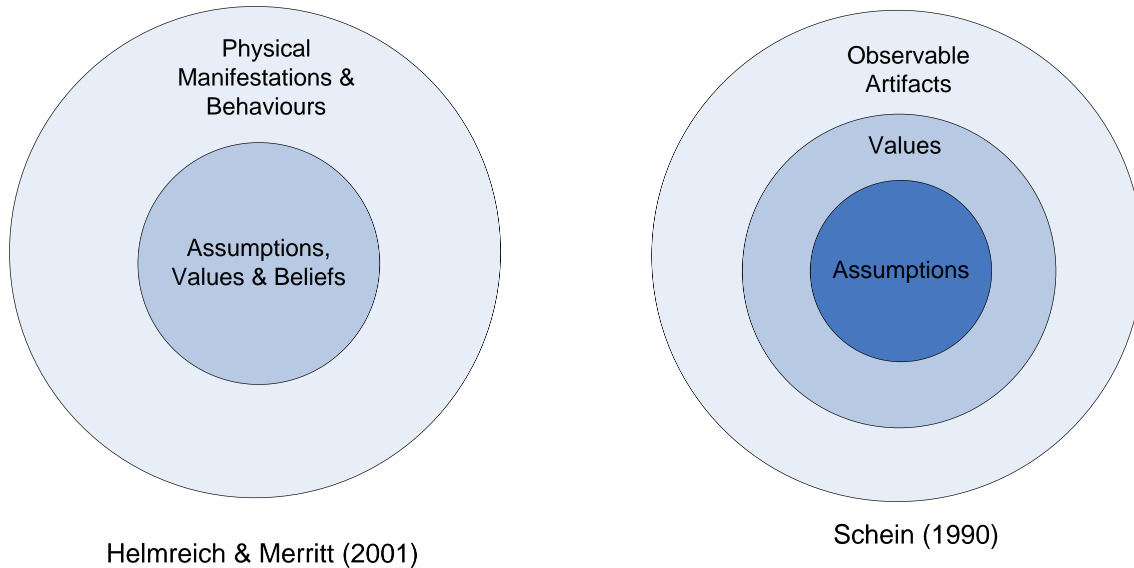
Review of the literature was initially focused on the concept of culture because Safety Action Teams were thought to improve an organization's safety culture by engaging and empowering staff at the 'sharp end'. The following section contains the results of the first phase of the literature review. It provides a description of culture, subculture, safety culture, climate, and cultural formation and evolution. The section concludes with a comparison of the role of leadership in influencing safety culture versus the concept of subjective and objective responsibility that drives an individual's actions and behaviors.

Culture

Culture, and in particular safety culture, has been the subject of much discussion in the patient safety literature. A major concept in the literature concerns the application to healthcare of a systems approach to understanding organizational accidents (Reason, 1990). This systems approach has facilitated a greater awareness of the contribution of organization-level factors, such as culture. Culture is an abstract construct that has been studied by different disciplines, with many experts having developed their own definitions. Schein (1990) presents a comprehensive definition of culture as "a pattern of basic assumptions invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore is to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (p. 111). Thus, culture is learned from one's social environment (Hofstede, 1991). Helmreich and Merritt (2001) define culture as the "values, beliefs, assumptions, rituals, symbols, and behaviors that define a group" (p. 109). Simply put, culture is "the way we do things here" (Helmreich & Merritt, 2001, p.1).

Culture is comprised of different layers. Helmreich and Merritt (2001) distinguish between two distinct layers. One is the surface or outer layer, which is visible. This layer is composed of two elements - observable behaviors and physical manifestations, such as symbols and uniforms. The second or deeper, inner layer contains the subconscious assumptions, values, and beliefs, which guide behavior and influence the physical manifestations of the surface layer. Somewhat similarly, Schein (1990) divides culture into three levels – observable artifacts, values, and basic underlying assumptions. The artifacts level contains behaviors, patterns of norms, and objects that can be captured through observation. Within the mid-layer are the beliefs and values that individuals are able to verbalize. The third and deepest layer contains the unconscious assumptions. These begin as values, but as they eventually become taken for granted, they develop into assumptions that are no longer questioned and not openly discussed. It is this inner-most layer of assumptions that influences values, beliefs, and hence behaviors. Figure 1 depicts the author's interpretation of these two models in illustrated format.

Figure 1: Breakdown of Culture



Culture can also be divided into different types. For example, Hofstede (1991) lists multiple types of culture: national, regional, generational, and organizational, as well as gender and social class levels of culture. In studying culture in aviation and healthcare, Helmreich and Merritt (2001) focus on three types: national, organizational, and professional. Because each type of culture has its own values, beliefs, and assumptions, conflict may occur amongst those in the other types of culture. Also, since culture is shared by a given group of people, individuals may belong to different types of culture simultaneously. This means that individuals may demonstrate unpredictable and inconsistent behaviors (Hofstede, 1991; Schein, 1990).

In the study of patient safety, the focus has been on culture at the organizational level. This can be defined as "the patterned way that an organization responds to its challenges" (Westrum, 2004, p. ii22). In other words, it is not only the way things are done in an organization, but also "why we do them" (Carroll & Quijada, 2004, p. ii16). Culture, therefore, reflects the established polices and values of an organization (Westrum, 1996).

Subculture

Just as organizations are made up of smaller units, the organizational culture is comprised of many subcultures (Schein, 1990; Carroll & Quijada, 2004; Davies, Nutley & Mannion, 2000; Ramanujam & Rousseau, 2006; Zboril-Benson & Magee, 2005). Thus, an organization will not have one unitary culture, but rather many, smaller cultures. As described by Edmondson, "hospital cultures, in short, are patchwork quilts rather than uniform, smooth fabrics where learning culture, or what some have called patient safety culture, is concerned" (Henriksen and Dayton, 2006, p. 1547). Subcultures develop around a subset of organizational members who see themselves as a distinct group, and as

such, the subcultures reflect the organization's diverse geographical and functional units (Zboril-Benson & Magee, 2005).

Cultural differences often exist among these various groups. Using the Schein model, at the surface layer of culture, various groups may distinguish themselves through different physical manifestations and behaviors (Davies, Nutley, & Mannion, 2000). At the deeper layers of culture, there may be differing values, beliefs and assumptions. For example, some groups may be more accepting or more resistant to change (Davies, Nutley, & Mannion, 2000). Furthermore, there may be differences in the power and influence that these groups may have in the organization. According to Schein (1990), "once a group has many subcultures, its total culture increasingly becomes a negotiated outcome of the interaction of its subgroups. Organizations then evolve either by special efforts to impose their overall culture or by allowing dominant subcultures that may be better adapted to changing environmental circumstances to become more influential" (p. 117).

Safety Culture

The concept of safety culture has evolved from organizational culture (Vincent, 2006). Safety culture represents the shared beliefs, norms, attitudes, roles, and behaviours that a group of individuals have that are concerned with safety (Pidgeon & O'Leary, 1995). A culture of safety establishes safety as an over-riding priority within an organization (Mearns, Whitaker, & Flin, 2003), and is the 'engine' that drives the organization towards the goal of attaining maximal safety (Reason & Hobbs, 2003).

Reason states that a safety culture is an informed culture, which itself is composed of four main components: a reporting culture, a just culture, a learning culture, and a flexible culture (Reason, 2000; Reason & Hobbs, 2003). A *reporting culture* represents an organizational climate where individuals report freely about safety, including actual events as well as close calls and hazards. Reporting requires establishing a *just culture*, with an atmosphere of trust and a shared understanding of acceptable and unacceptable behaviors. A *learning culture* has the necessary systems and willingness to understand the safety concerns and to implement changes to mitigate the identified risks. A reporting culture is a pre-requisite for developing a learning culture. Lastly, an organization must be *flexible* to respond to danger, such as the ability to shift from a traditional hierarchical structure to a flatter structure with deference to experts at the front-line when necessary.

Can an organization's safety culture be 'good or bad'? Westrum (1995, 1996, 2004) has developed a typology of organizations based on a patterned way of dealing with information flow. This is vitally important, as information is the basis of human interaction and the foundation for organizational performance. Research has shown that failures in information flow are particularly prominent in major organizational accidents (Westrum, 1995, 2004). Westrum's typology contains three categories of organizations: pathological, bureaucratic, and generative. Table 1 outlines the characteristics of these types.

Table 1: Westrum's Typology of Organizations Based on Response to Information

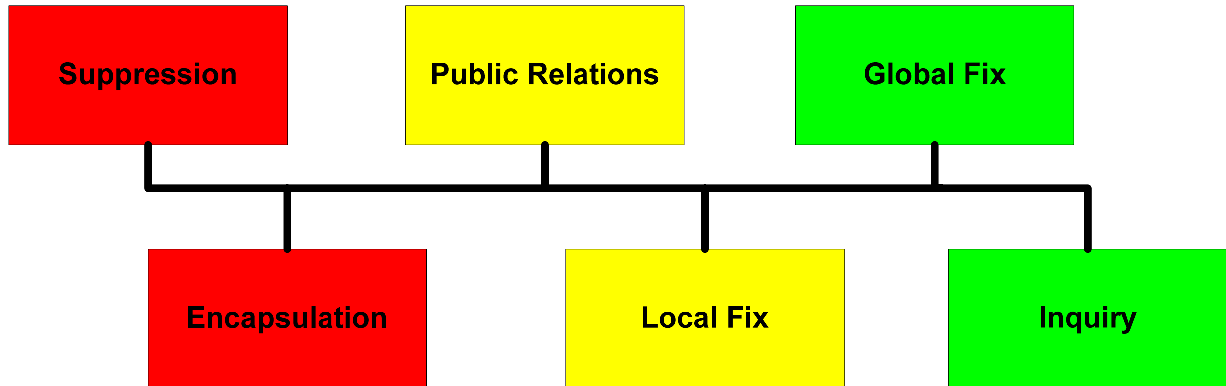
	Pathological	Bureaucratic	Generative
Information	Information is used for personal power	Information is routine	Information is seen as key resource
Responsibility	Responsibility is shirked	Responsibility is compartmentalized	Responsibility is shared
Messengers	Messengers are shot	Messengers are listened to if they arrive	Messengers are trained
Bridging	Bridging is discouraged	Bridging is tolerated	Bridging is rewarded
Failure	Failure is punished or covered up	Organization is just and fair	Failure leads to inquiry / learning
New ideas	New ideas are actively crushed	New ideas present problems	New ideas are welcomed

(Westrum, 1995, p. 76)

In pathological organizations, information is suppressed and people who identify a problem are silenced. Bureaucratic organizations are rigid, see new ideas as problems, and deal with problems reactively. In contrast, generative organizations embrace information, seeking problems and solutions proactively. Westrum (2004) submits that organizations progress through these levels as their approach to safety matures.

Organizations also respond to problems or anomalies in different ways. Westrum (1995, 1996) describes a spectrum of responses (see Figure 2). On the left side of this spectrum are the denial responses of suppression and encapsulation. These reactions tend to occur in pathological organizations. The middle of the spectrum shows reactions common in bureaucratic organizations, including explaining away the immediate problem or using quick fixes without deep inquiry. On the right side, responses include reflective inquiry in order to understand and correct underlying problems and implement global fixes. Generative organizations employ strategies on the right side of this spectrum.

Figure 2: Westrum's Classification of Organizational Responses to Anomaly



(Westrum, 1995, p.77; Westrum, 1996 p. 6)

Culture versus Climate

The terms safety culture and safety climate have often been used interchangeably in the literature. However, some authors have attempted to highlight the difference between the two. Safety climate, considered to be one aspect of safety culture, is the surface features of an organization's underlying safety culture; it is concerned with the workforce's attitudes and perceptions of the actions taken within the organization that reflect the priority given to safety (Helmreich & Merritt, 2001; Flin, 2003; Flin, Burns, Mearns, Yule, & Robertson, 2006; Mearns, Whitaker, & Flin, 2003; Goodman, 2003; Garcia, Boix, & Canosa, 2004). Safety climate can shape safety culture through its influence on motivation, perceived stress, and operational efficiency (Helmreich & Merritt, 2001).

Organizations in many different industries have employed surveys of safety climate as a measure of the perception held by the workforce about management's attitudes and behaviors. Research by Flin and colleagues determined that there was significant overlap in the dimensions of safety climate between healthcare and industry, as measured by safety climate surveys (Flin, Burns, Mearns, Yule, & Robertson, 2006). Research from both healthcare and industry identified management and supervisor commitment to safety, safety system, and work pressure and job demands as core elements. Other elements identified in the healthcare surveys included reporting, speaking up, risk perception, safety attitudes and behaviors, communication and feedback, teamwork, personal resources, and organizational factors. While there are some differences in the number and type of safety climate elements identified in the research, there is a core group of elements that have been used as predictors of safety behaviors and accidents (Mearns, Whitaker, & Flin, 2003; Garcia, Boix, & Canosa, 2004).

Cultural Formation and Evolution

How does the culture in an organization become initially established and then evolve? According to Schein (1990), an organization's culture is established when the two inner most layers of culture, that is the norms, beliefs, and assumptions, are initially created. This creation occurs as a result of two mechanisms. The first is the development of norms and beliefs flowing from a significant event. When an emotional or stressful event occurs, new norms can arise in an organization. These norms may gradually transform into new beliefs, and eventually become assumptions. The second mechanism for establishing culture is identification with organizational leaders. Through modeling, leaders demonstrate beliefs, values, and assumptions that members of the organization then internalize as their own. This occurs through primary embedding mechanisms of leaders' priorities, behaviors, reactions, and reward allocation. The second mechanism also involves secondary articulation and reinforcement mechanisms such as the creation of structures, processes, and formal statements of organizational philosophy.

Culture cannot be mandated, but instead develops, is learned, and changes slowly over time (Westrum, 1996; Carroll & Ouijada, 1996; Schein, 1990). The organization's existing culture is shared with new members of the organization through socialization and orientation (Schein, 1990). Socialization and orientation vary widely between organizations and between professions. As well, the socialization of many healthcare professionals occurs *before* employment, during their education and training. "Weak organization-based socialization means that individuals can have as many different professional practices and care-giving behaviors as the institutions that educated them… The result is strong professional identification and weak organizational identification" (Ramanujam & Rousseau, 2006, p. 814). Therefore, socialization and orientation can variously result in new members completely learning and accepting *all* assumptions, learning *central* assumptions but rejecting peripheral ones, or lastly, totally *rejecting* all assumptions.

Cultural change can occur either through natural evolution or through guided evolution and managed change (Schein, 1990). Natural evolution occurs with stresses from changing environments or from introduction of new members bringing new beliefs and assumptions. In contrast, guided evolution occurs when leaders consciously guide the direction of the culture change. To guide and manage organizational change, Davies, Nutley, and Mannion (2000) recommend being selective: that is, focusing on specific cultural elements requiring change while also identifying aspects for retention. Specific to safety culture development, changes must be made to the organizational elements that affect safety, such as information flow within the organization, leadership characteristics, staffing levels, and reporting relationships (Goodman, 2003). According to Behal (2004), fundamental cultural change will not occur from first-order change interventions; rather, second-order interventions are required. Second-order change results when numerous levels of the organization are specifically targeted with interventions unique to the organizational mission, strategy, leadership style and culture. The example provided by Behal (2004) is reporting of adverse events; developing first-order change interventions, such as mandatory reporting structure and process, will result in increased reporting. However, second-order interventions are required to develop organizational values and

norms that promote participation in learning and re-design in order to result in safer patient care.

When discussing organizational culture change, there is some debate regarding which layer of culture to focus on – the inner layer where attitudes, values, and assumptions lie, or the surface layer's behaviors and physical manifestations. While it is recognized that change must occur at both layers, most organizational psychologists would argue the most effective approach would be to focus on organizational practices and individual behaviors (Reason & Hobbs, 2003; Hopkins, 2002). Strong support for this approach comes from the fact that while management can directly affect practices, management may not directly affect values. The implementation of new structures and behaviors will create tension because of misalignment between the new behaviors and the old values and assumptions. In order to alleviate this tension, values and assumptions may also change in order to align with the new behaviors (Reason & Hobbs, 2003; Hopkins, 2002; Beer, Eisenstat & Spector, 1990).

Leadership's Role in Influencing Culture

Much of the work in safety and culture highlights the significant role that organizational leaders have in influencing culture (Westrum, 1993; Vincent, 2006; Morath & Turnbull, 2005; Frankel, Leonard & Denham, 2006; Morath & Leary, 2004; Ruchlin, H., 2004; Morath, 2004; Schein, 1990). Leaders determine organizational culture through their decisions and actions. For example, executives prioritize and decide which tasks the organization will undertake, which tradeoffs will be made (for example, between safety and efficiency), and what responses will be made to negative outcomes.

Flin and Yule (2004) examined safety and leadership in healthcare by stratifying leadership into three levels. The first is the operational level, which includes the team leader or first-line supervisor, who have the primary responsibility for coordinating work activities and maintaining the wellbeing of the team. Next is the tactical level of management, where the department / unit head or manager resides. Managers directly influence worker behaviours by role-modelling and reinforcing safety behaviours, and through setting the supervisor's goals and priorities. Managers also indirectly influence culture through demonstrating their commitment to safety. Lastly, there is the strategic level, which includes the organization's senior management and chief executive officer. Individuals at this level influence safety by the decisions they make and how they respond when things go wrong. According to Flin and Yule (2004), "the higher individuals are in an organization, the greater their potential to influence organizational outcomes" (p. ii48). Choices made at the top of the organization set the overall priorities and affect the attitudes and behaviours of everyone throughout the organization.

Behaviours of the leadership group can also be categorized as transactional or transformational. *Transactional leadership*, as the basis of management, describes a leader-follower relationship of 'transactions'. The basic transaction is in the form of incentives (rewards) and punishments given by the leader in exchange for the follower's performance. Transactional leadership activities include setting goals, monitoring

performance, and reinforcing behaviours through rewards and sanctions. In contrast, *transformational leadership* is concerned with providing a sense of purpose, motivation, and empowering the team, and is required to achieve higher performance. Flin and Yule (2004) outline the transactional and transformational leadership behaviours at the three organizational levels (see Table 2).

Table 2: Flin & Yule's (2004) Leadership Behaviours for Safety

	Transactional behaviours	Transformational behaviours
Supervisors	▪ Monitoring and reinforcing workers' safe behaviours ▪ Participating in workforce safety activities	▪ Being supportive of safety initiatives ▪ Encouraging employee involvement in safety initiatives
Managers	▪ Becoming involved in safety initiatives	▪ Emphasizing safety over productivity ▪ Adopting a decentralized style ▪ Relaying the corporate vision for safety to supervisors
Senior / Executive Management	▪ Ensuring compliance with regulatory requirements ▪ Providing resources for a comprehensive safety program	▪ Demonstrating visible and consistent commitment to safety ▪ Showing concern for people ▪ Encouraging participative styles in managers and supervisors ▪ Giving time for safety

Transactional leadership is the basis of leadership, regularly occurring between leaders and subordinates. Leaders will give reward or punishment in exchange for the subordinate's behaviours and performance. Transactional leadership will result in achieving expected performance. In contrast, transformational leadership behaviours can lead to increased motivation and performance of subordinates. Transformational leadership behaviours include supervisors supporting and encouraging staff to participate in safety initiatives; managers demonstrating commitment to safety, relaying the organizational vision, and employing participative leadership styles; and, lastly, senior management demonstrating commitment to safety by providing resources and dedicating time for safety management, encouraging participative leadership, and setting a corporate vision of safety.

Subjective and Objective Responsibility

The 'sharp-end' of the system is where the healthcare professionals provide care to patients, away from the 'blunt-end' of the system where leaders make decisions. While culture and climate can help to explain 'the way things are done around here', the concepts of subjective responsibility and objective responsibility is also valuable for understanding the potential motivations behind an individual's actions and behaviors.

According to Kernaghan and Siegel (1999), objective responsibility is "the responsibility of a person or an organization to someone else, outside of self, for some thing or some kind of performance" (p. 369). Similar to accountability or answerability, objective responsibility is the "first essential of hierarchy" (Mosher, 1995). Subjective or psychological responsibility is about feeling personal responsibility (Kernaghan & Siegel, 1999). Individuals with objective responsibility will feel responsible, accountable and answerable to positions of authority and power. In contrast, those with subjective responsibility are concerned with conscience and loyalty, and can be described as being innovative, taking risks, and bending the rules to achieve their objectives (Kernaghan & Siegel, 1999).

Summary

Culture is the structural underpinning of an organization and the sub-units within an organization. The actions of individuals and the physical manifestations are the observable artifacts of culture, while underneath this are the deeper layers of values and assumptions that drive the observable artifacts. Safety culture is one aspect of organizational culture, and determines the priority given to safety in an organization.

An organization's safety culture can be categorized by assessing how information is handled. Leadership at the 'blunt end' and front-line staff at the 'sharp end' have different roles and motivators in safety culture. Through their words, actions, and priorities, leaders plays a significant role in shaping and driving cultural change. Transformational leadership can influence front-line staff to greater motivation and productivity. Also, individuals' motivation for action can be as a result of feeing either personal (subjective) responsibility or objective accountability to authority.

To further understand why and how Safety Action Teams can make improvements to patient safety, an understanding of clinical microsystems and social networks is required. This topic is taken up in the next section of this report.

UNDERSTANDING SOCIAL NETWORKS AND CLINICAL MICROSYSTEMS: A LITERATURE REVIEW

The second phase of the literature review sought to develop a better understanding of clinical microsystems and the concepts of social capital, social networks, and network weaving. These topic areas were chosen because they provided additional concepts important for understanding why and how SATs can be effective in making safety improvements. For example, Safety Action Teams function at the clinical microsystem level within an organization, which is the 'sharp-end' of the care delivery. As well, social networks are the structure that can enable or prevent information and knowledge exchange across an organization and beyond.

Clinical Microsystems

Complementing the concepts of culture and climate is that of the 'clinical microsystem', defined as a "group of clinicians and staff working together with a shared clinical purpose to provide care for a population of patients" (Mohr, Batalden & Barach, 2004, p. ii34). The organization, considered a macrosystem, is comprised of many microsystems. For example, within a hospital the ICU, outpatient clinic, and the surgical care team can be seen as separate clinical microsystems. The essential or core components of a clinical microsystem are defined by their purpose and setting. The core components of a clinical microsystem in healthcare would include the focused type of care provided, the kinds of team members with the required skills and training, a defined patient population, equipment, and the information and technology to support the work (Mohr & Batalden, 2002; Mohr, Batalden & Barach, 2004; Barach & Johnson, 2006).

The performance of microsystems also depends on specific characteristics, with high-performing ones sharing common characteristics (Mohr, Batalden, & Barach, 2004; Barach & Johnson, 2006). The ten characteristics of high performing microsystems in healthcare as described by Barach and Johnson (2006) include:

- *Leadership* – leaders who balance the setting and reaching of collective goals and empowerment of individual autonomy and accountability;
- *Organizational support* – the macrosystem supports the work of microsystems and coordinates hand-offs between the microsystems;
- *Staff focus* – selective hiring of the right people, and the existence of an orientation process that integrates new employees into culture and roles;
- *Education and training* – ongoing education and training of staff, and training of students in academic facilities;
- *Interdependence* – staff interaction is respectful, trusting, collaborative, and recognizes contributions of all team members;
- *Patient focus* – the primary focus is the patient and meeting all of his/her needs;

- *Community and market focus* – the microsystem establishes and maintains excellent and innovative relationships with the community;
- *Performance results* – focus on measuring and monitoring patient outcomes, costs, and feedback;
- *Process improvement* – continuous quality improvement including ongoing monitoring of performance and innovative tests of change / improvement;
- *Information and information technology* – technology to support communication, and information as the connection between staff and with staff and patients. (p. i11)

The concept of microsystems is particularly important in the context of quality improvement. Focus should be on the microsystem for the design and redesign of care, since they produce the quality, safety, and cost outcomes at the front lines of care. Better functioning microsystems provide safer care and achieve better patient outcomes (Mohr & Batalden, 2002). As described by Barach and Johnson (2006), this is consistent with Donabedian's model of structure, process, and outcome; improving clinical outcomes requires an understanding of the linkages between outcomes, processes, and structures, with a focus on making improvements to the structures and processes in order to achieve better outcomes for patients.

Social Capital, Networks, and Weaving

The final concepts with important implications for the effectivness of SATs are social capital, social networks, and network weaving. The importance of social capital has been prominent in the fields of organizational behaviour, political science, economics, crime and safety, as well as health (Policy Research Initiative, 2007; Wikipedia, 2008).

Social Capital and Social Networks

Social capital concerns the norms and networks of social relations, and in particular how these relations provide individuals with access to information, resources, and supports (Policy Research Initiative, 2007). The word "capital" is important because social capital is the social resources and assets that can be used and leveraged for material and health gains. Social networks are the structural components of social capital, describing the patterns of relations among social units or actors (Scott & Hofmeyer, 2007). Social capital and social networks influence the actions of individuals and groups. The converse is also true: actions influence social structures (Scott & Hofmeyer, 2007; Woolcock, 2001).

Networks are structures that affect social support and facilitate knowledge exchange (Scott & Hoffmeyer, 2007). According to Woolcock (2001), there are three types of social networks – bonding, bridging, and linking – that can describe the different patterns of relations. *Bonding networks* are close ties that exist among family, friends, and neighbours. *Bridging networks* connect people who are more distant. These more distant ties contribute to exchange of new information, ideas, and knowledge (Scott & Hofmeyer, 2007). The third type, *linking networks*, describes the vertical dimension of

relations, that is, the tie among individuals in differing positions of authority or other organizations. Linking networks allow for the leverage of resources and information.

The notion of "the strength of weak ties" comes from Granovetter (1973, 1983) when comparing the flow of information in different types of social networks. Weak ties, such as in bridging and linking networks, are useful because they support access to new information, resources, and opportunities. "People are less likely to gain new information if they participate in networks that are characterized by redundant connections or strong interlocking ties and frequent and ongoing contact between limited numbers of similar people who share the same knowledge" (Scott & Hofmeyer, 2007, p. 8).

Structural holes in the social structure occur from weaker connections between groups. These holes create boundaries between groups. While the holes have the benefit of insulating groups of people from others to allow for professional specialization, too many holes can lead to differing expectations and a lack of cohesion (Scott & Hofmeyer, 2007). People who play boundary-spanning roles, individuals who operate across these structural holes, have cross-cutting ties to other networks, and thus become brokers of new ideas and facilitate knowledge exchange (Scott & Hofmeyer, 2007).

Network Maps

Network maps can be used to visually represent the network. A map includes the nodes (people, groups, organizations) and the links (relationships, transactions) in a network. Krebs and Holley (2002) identify four stages of networks illustrated in the maps:

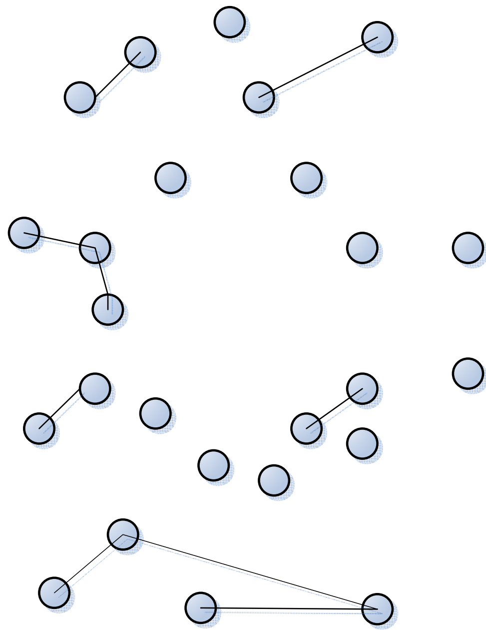
- scattered fragments;
- single hub-and-spoke;
- multi-hub small-world network; and
- core/ periphery.

Most networks begin as scattered fragments. Progression through the intermediary stages of single hub-and-spoke and multi-hub small-world network may occur, until ultimately developing into the final, efficient stage of the core / periphery network.

Networks necessarily begin as small clusters of people or organizations, organized around common interests or goals. These clusters are often isolated from each other. This stage, called 'scattered fragments', is weak and under-producing (see Figure 3 – Scattered Fragments Network).

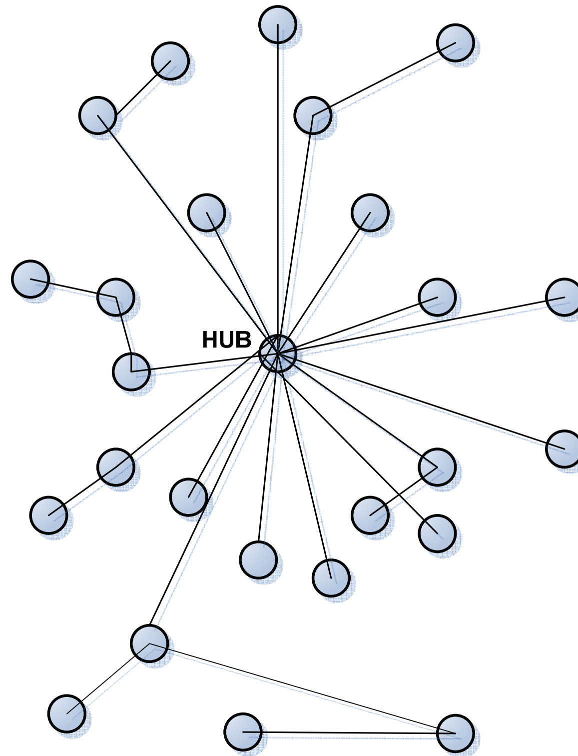
In the second stage, an active leader (the 'network weaver') emerges who creates links between the fragments. The social structure changes to that of a hub-and-spoke, with the network weaver as the hub and their links to the fragments as the spokes. These new links support the exchange of information and ideas. This type of network concentrates power, as well as vulnerability, with the hub. Thus, it is only a temporary stage; if the weaver fails or leaves, then the network will revert back to scattered fragments (see Figure 4 – Single Hub-and-Spoke Network).

Figure 3 – Scattered Fragments Network



(Adapted from Krebs & Holley, 2002)

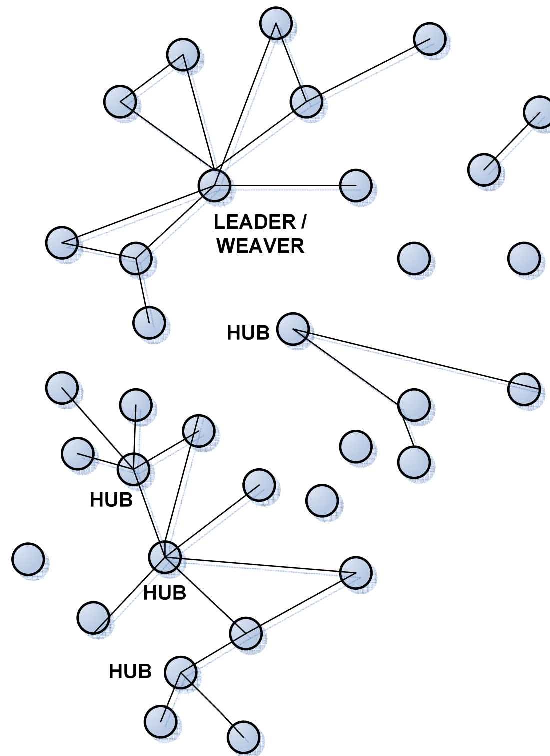
Figure 4 – Single Hub-and-Spoke Network



(Adapted from Krebs & Holley, 2002)

In a healthy network, there is progression from the single-hub-and-spoke to the multiple hub/ weaver network. This occurs as the weaver encourages the clusters to develop their own connections by introducing clusters with common goals or complementary skills. As these clusters develop their own links, the connection to the hub becomes weaker and eventually dormant (although it never severs, and can be re-activated when required). The advantages of the multiple hub/weaver network are numerous: (1) removal of the single point of failure (hub); (2) development of 'weak ties' with resulting knowledge transfer and innovation; and (3) shorter paths throughout the network that speed the transfer of information and knowledge (see Figure 5 – Multiple Hub/Weaver Network).

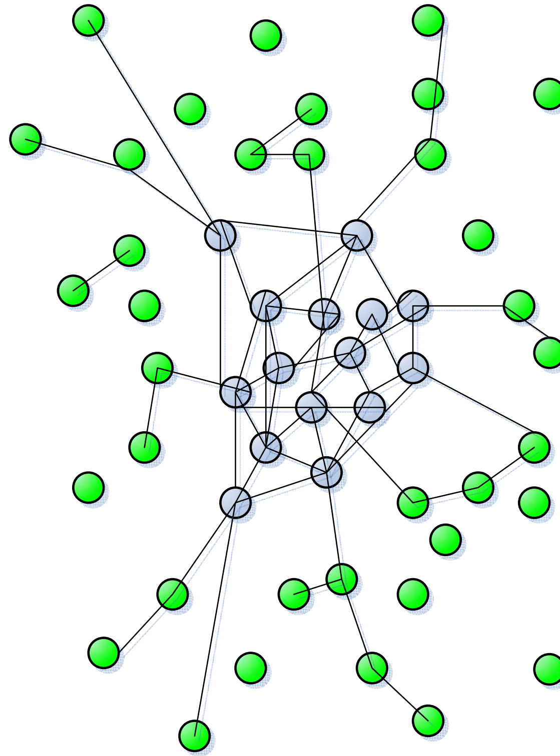
Figure 5 – Multiple Hub/Weaver Network



(Adapted from Krebs & Holley, 2002)

The most developed and resilient type of network is the core/ periphery model, which may result after years of network weaving by numerous hubs. The core is where the key group is, including many of the weavers, connected by strong ties. In the periphery are nodes that are linked through weaker ties, and include new members, bridges to external communities, and resources outside of the network's community. The periphery pulls in new information and ideas not established in the network. The core acts on these new ideas and information (see Figure 6 – Core/ Periphery Network, where the blue dots are representative of the core and the green dots are the periphery).

Figure 6 – Core / Periphery Network



(Adapted from Krebs & Holley, 2002)

Summary

The clinical microsystem is the ideal level to influence safety improvements. It is at this level where patient care occurs and thus outcomes result. Social networks are the social structures that may enable information and knowledge exchange. Different types of networks exist, with those that provide connection to distant people and to positions of authority proving to be more effective in bringing in new ideas. There are numerous stages of social network maturation, with enhanced knowledge exchange occurring as networks progress to the most advanced stages. Knowing about social networks work is important for understanding how individuals and teams in a clinical microsystem can access new information, innovative ideas, and resources.

In the next section of this report, the findings from the SAT member interviews will be presented.

FINDINGS

Over a one-month period, 16 potential participants were identified and contacted by the investigator with a personalized invitation to participate in an interview. A total of eleven participants initially agreed to partake in a semi-structured interview, with ten individuals participating by the end of the project.[2] The response rate was 62.5%. Interviews were conducted between April and May 2008, and occurred at a location of the participants' choice. Before the beginning of each interview, informed consent was obtained and participants signed the consent form. In addition, the investigator provided background information on the project and allowed participants to ask questions before the interview started. Using the interview questions as a guide, the investigator took written notes of the conversation. At the conclusion of the interview, participants were allowed to make any additional comments or to ask questions. Interviews lasted between 30 and 90 minutes.

A variety of individuals with different roles and from team different teams across the Region participated in the interviews. Of the ten participants, nine were staff working at the sharp end of the healthcare system and one was at a manager-level. Seven were current or former leads / co-leads / chairs[3] of SATs, two were members / representatives, and one was a manager of a unit with a SAT. Two individuals were from the same Safety Action Team, thus individuals from nine distinct teams informed the findings of this study. These nine teams were from inpatient acute care, outpatient care, and clinical service areas that do not provide direct patient care. The teams were also from four different clinical portfolios[4] and from six different locations / sites in the Region.

SAT Demographics and Function

Of the nine SATs, two of them had recently been established. Another two teams had been in existence for between one and two years, while the remaining five were well-established, with more than three years of experience. Six teams were active, reporting that regular meetings were occurring. Three teams were in various stages of inactivation; one had recently been disbanded (as directed to by the leadership of the team's area), one team had not met regularly recently but was focusing on other safety activities such as policy roll-out. The remaining SAT had carried out a safety walkthrough to identify problems but no meetings or subsequent follow-up had occurred.

---

[2] One individual expressed interest in participating in an interview, but it was not possible to schedule an interview in the timeframe of the project.

[3] Individuals called themselves by different terms to describe the role of the person heading the work of the SAT. This could be chair or lead, and in situations where this was a shared responsibility, a co-lead. As well, one of the participants had just resigned her position as chair of the SAT.

[4] Prior to the restructuring and implementation of one Board by Alberta Health & Wellness, clinical operations within the Calgary Health Region were divided into clinical portfolios headed by a vice-president. At the time of the interviews, there were five clinical areas that provided clinical care, as well as portfolios for Health Outcomes, Wellness, and Public Health.

Of the teams that met regularly, the majority reported meeting on a monthly basis, with one team meeting as frequently as every three weeks and another every six weeks. The durations of SAT meetings was reported to be as short as 45 minutes, and as long as 90 minutes. Eight of the nine teams set an agenda and took minutes. Team composition was as low as three members and as high as 20, with the majority reporting having between seven and nine members. About half of the teams reported team membership was from one professional grouping, while the other half described the inclusion of representatives from different healthcare professional / provider groups.

There was also variability in manager involvement; one team stated the manager was not involved at all, and in five of the teams the manager regularly attended the meetings. In the remaining three teams, the managers did not attend the meetings; instead, they received updates/ communication about the teams' activities and provided assistance in fixing problems when asked.

SAT Activities

All the participants felt the main activity of the team was to identify safety problems and hazards. All team members interviewed stated that issues were brought by either SAT members or other staff from the area. This occurred primarily through email or verbal communication; however some teams had employed "suggestion boxes" or "idea lists" for staff to anonymously report safety concerns directly to the SAT.

Six of the teams also stated they used Safety Learning Reports (or the old paper-based Incident Reports) to identify safety problems and trends. Only two of the teams described the use of quality improvement tools such as fish-bone diagrams, brainstorming and multi-voting. One team had developed a database to track safety issues and actions taken.

Eight of the nine teams reported that they had tested and/or implemented fixes to mitigate the identified safety issues on their units, as well as having developed strategies for sharing the fixes with the rest of their colleagues. Communication strategies included use of a unit specific 'communication book' (n=1), unit newsletter (n=2), distribution of minutes from the SAT meetings (n=4), sharing information at staff meetings (n=4), and posting information on a safety-specific bulletin board (n=4).

Some of the participants mentioned other activities beyond the core SAT activities of identifying hazards, making fixes, and communicating the improvements. Examples include policy development, informing and reviewing new policies, and providing both formal and informal education / training to staff on safety-related topics.

Members from eight of the nine teams who were interviewed were able to describe safety improvements they had undertaken in their local area. Some examples of patient-related improvements described by the SATs include:

- having non-functioning electrical plugs fixed;
- making changes to labeling of medications that are known to contribute to medication-related errors;
- setting-up emergency airway equipment in patient care areas;
- creating forms to improve inter-departmental communication during patient transfers;
- acquiring adequate lighting for power outages;
- reducing hallway clutter in order to decrease risk of patient falls;
- implementing ‘mock codes’ to increase staff knowledge and comfort in dealing with cardiac arrests and resuscitation;
- making changes in storage of medications;
- instituting a process to check and identify expired medications;
- replacing overfilled Biohazard (“sharps”) containers;
- having malfunctioning elevators fixed;
- re-designing medication rooms and narcotic cupboards; and
- making improvements to the administration of certain high hazard medications (narcotics and chemotherapy agents).

In addition to patient safety, 80% of the team members interviewed stated they had identified and/or implemented fixes to mitigate risks to staff safety. The majority of staff safety issues were related to poor ergonomics and factors contributing to back injuries. Changes made by the teams to address these issues included provision of back safety education to staff, implementation of new lifts, acquisition of transfer belts, and removal of items stored in hard-to-reach locations. One SAT had also implemented changes and provided staff education aimed at reducing staff exposure to hazardous materials.

Lastly, participants were asked to identify challenges their team had experienced. Representatives from all teams were able to identify challenges, which included:

- staff shortages;
- staff turn-over and changes in membership;
- recruiting staff to the team or to participate in tests of change;
- balancing demands of providing clinical care with the SAT activities of attending meetings, typing up minutes, and testing and implementing fixes;
- apathy and lack of concern for patient safety from staff who are not involved in the SAT;
- lack of skills and knowledge on patient safety, quality improvement and team facilitation;
- loss of momentum to see large-scale, time-consuming changes to completion;
- unequal distribution of work (usually work fell to the lead);
- lack of follow-through and follow-up;
- barriers to involving contracted service providers in the SAT activities; and
- difficulty involving other departments and units in solving a joint safety problem.

Discussing the challenges enabled the participants to provide suggestions on how to support the function of the teams and to integrate their activities with other initiatives.

SAT Support and Integration

Ninety percent (90%) of participants felt they had adequate support to make safety improvements. The one participant who said support was inadequate provided examples of failed attempts to make improvements and also described problems with getting staff involved and having a new manager who was not aware of the SAT. When asked what support or resources the teams had received from the Health Outcomes department, three participants (30%) stated they had not received any support to date; however, one individual had contacts and knew how to get support if it was required.

Of the 70% who had received support, two stated they had help from a QI Consultant at the beginning of the project but not ongoing help, with one stating a preference for additional support again. One team had ongoing support from a QI Consultant, while the remaining four participants reported receiving support from Health Outcomes when requested (e.g. human factors assessments and quality improvement expertise).

Participants were asked for their suggestions for how better to connect SATs with other teams, as well as how to integrate their team's work with other safety and quality improvement activities. Suggestions given included:

- workshops or education on how to influence and get others involved;
- use of the intranet to connect with other SATs;
- development of a resource of all existing SATs and key contacts;
- maintenance of an updated list of projects that the SATs are working on so that trends can be identified and so that SATs can partner up to work on things together;
- creation of a venue for SAT leads to communicate with each other;
- meetings with the various SATs;
- support of members of different SATs to sit in on another team's meeting; and
- circulating a newsletter dedicated to safety that would be a resource of information and highlight 'good news' stories.

In addition, some participants had general advice on developing a structure. One participant thought it was important to allow for variability and creativity in team function and set-up and to also 'keep things simple'. Others commented on the need to ensure adequate management support for staff to participate and attend meetings, to receive support from Health Outcomes, and to foster developing a just and trusting culture.

Summary

The findings from interviews of representatives of SATs indicate that, while there is variability in teams function and demographics, there was consensus on the purpose and goals of the SATs. All teams set out to identify, analyze, and make improvements to patient safety at their local level. Teams employed a range of different methods for achieving their goal and for communicating safety fixes to others within their local environment. Significant safety changes have resulted at their local levels, with only one team not having made any changes. All participants felt there was a need to better integrate the work of the various safety action teams, to provide additional support, and to establish a network to allow sharing of safety information across the Region.

In the next section, information from the literature review and the findings of the interviews will be compiled, discussed, and presented as a conceptual framework.

CONCEPTUAL FRAMEWORK

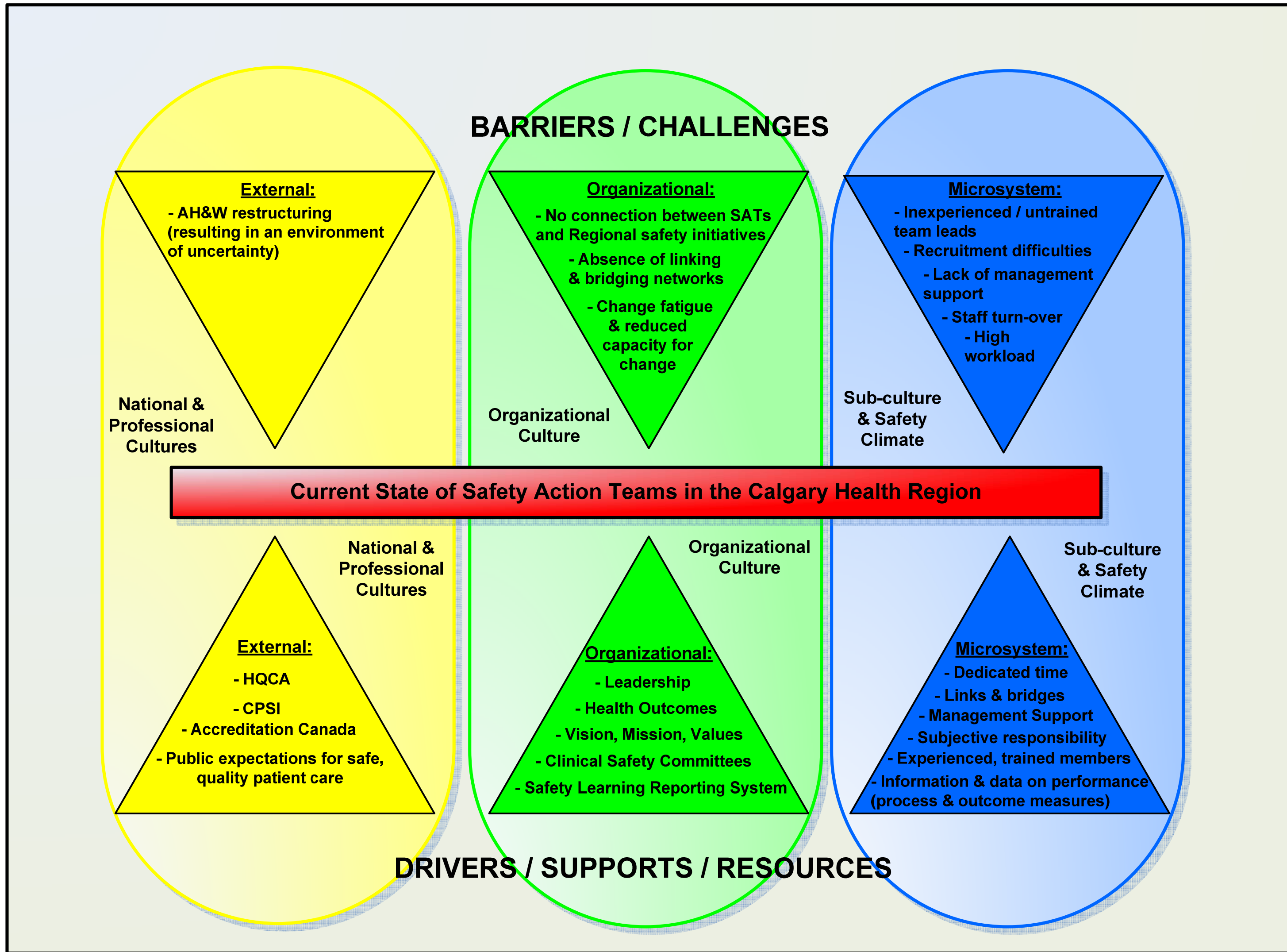
In combining the results of the literature review with the findings from the interviews, a number of key factors were identified as having the potential to impact the function of the Safety Action Teams. These factors can be grouped as being supporters and drivers or as challenges and barriers. The factors also exist at three different levels: at the clinical microsystem level where the SATs exist, at the organizational level within the boundaries of the Calgary Health Region, and at a level external to the Calgary Health Region. Cultures, sub-cultures, and climates similarly exist at each of these three different levels (see Figure 7).

Although not identified by the members of the SATs, numerous factors influencing safety work comes from organizations external to the Calgary Health Region. One driver is Accreditation Canada and its safety-targeted Required Organizational Practices. Patient safety activities are also supported by non-regulatory organizations that operate at arms-length from government, including the Canadian Patient Safety Institute and the Health Quality Council of Alberta. Another strong external driver for patient safety initiatives are the expectations of the public, patients, and their families to receive safe, quality patient care, which are often expressed through the media.

Numerous factors that are seen as challenges and barriers to patient safety initiatives also exist at the level external to the Calgary Health Region. The restructuring of healthcare service delivery and establishment of a new Alberta Health Services (AHS) Board is a significant challenge due to uncertainty about how the organization will look and function, as well as the constant flux in personnel since the announcement earlier this year. However, AHS does have an opportunity to shape the new organization's safety culture. If handled well, the new organization has the potential to drive and support SATs. This will be contingent on whether or not the AHS leadership moves beyond merely stating that quality and safety will be a priority and follows it up with investments in financial and human resources dedicated to patient safety. Lastly, within this external environment, there are cultures beyond the organizational level, including national and professional cultures, which influence the actions and behaviors of the healthcare providers and SAT members.

The next level is organizational, depicted in green in Figure 7. Several barriers and challenges impact SATs at this level. For example, there is no connection between the SATs' work with Regional priorities or Regional safety initiatives, and no mechanism to prioritize Regional safety initiatives. There is a lack of linking and bridging networks to connect the SATs with each other and with other similar microsystem-level groups. SATs typically work in isolation from other initiatives, and vice versa. In addition, the merger of the Calgary Health Region with eleven other entities to form AHS at a time when the Region was in the midst of a re-organization, has resulted in significant 'change fatigue' and a reduced capacity to undertake new large-scale changes.

Figure 7: Thematic Factors Influencing SAT Function



However, there are also many factors and resources at the organizational level that can support the function of SATs. Despite losing the Chief Executive Officer (who was a staunch supporter of safety) as the new AHS was created, the remaining executives continue to voice their support of patient safety as a priority. Quality and safety are articulated as core values of the organization and function as corporate reminders of the importance of the safety and quality improvement activities. There are also resources for quality improvement and patient safety, including the Health Outcomes portfolio and the Clinical Safety Committee structure. The new on-line Safety Learning Reporting system, launched in March 2008, was designed to foster a reporting and learning culture and required significant leadership support to ensure that its core design principles were respected and retained. The final organizational-level element influencing SATs is the organizational culture and in particular, its safety culture. Safety culture will dictate the priority placed on safety in the organization; if the priority is high, SATs will feel valued and supported, whereas SATs will be negatively impacted if safety is not seen as an organizational priority.

The third level in the conceptual framework is the clinical microsystem, where clinical care is provided and where SATs function. Barriers and challenges to SATs at this level include: a lack of management support; team leaders who are inexperienced or untrained in quality improvement methodology and facilitation; significant turn-over of staff; high workload; and difficulties in recruiting staff to participate on teams or redesign work.

As with the other levels, many driving and supporting factors enable and support the work of the SATs at the microsystem level. For example, factors such as management support and dedicated time for conducting SAT activities are significant supporters. Having knowledgeable and skilled team leaders, as well as team members with training in quality improvement methodology, is critical for productive teams. In addition, staff must feel *subjective responsibility* for patient safety. Participants from teams who were higher functioning described the existence of links to management or higher-level committees to access resources and support, and bridges to external agencies and individuals more distant and who function as conduits of information and ideas. Access to safety information and data on performance of safety measures are valuable resources to SATs. The last factor that influences SAT at the microsystem level is the existence of subcultures and safety climate. Subculture drives the values, assumptions, and behaviors of individuals, and can either positively or negatively impact SAT function and team members' behaviours. Safety climate, being the perception staff have of the organization's underlying safety culture and their attitudes towards safety, is the value and attitudinal driver for individual and team behaviours.

In summary, many factors exist at three different levels that influence SAT function and activities. These factors can be seen as supporters and drivers or as barriers and challenges. Moreover, various types of culture, unit sub-culture, and safety climate have a positive or negative impact on SATs.

In the next section, the findings of the literature review, the results of the interviews, and the conceptual framework will be discussed and debated with the intent of presenting a way forward for better supporting the teams and integrating their activities with safety management across the organization.

DISCUSSION

The focus thus far has been on safety culture, based on an initial hypothesis that Safety Action Teams could influence the safety culture of an organization. This hypothesis was based on an assumption that the unit of currency for SAT's was behaviour change. SATs exist at the clinical micro-system level. Because this is the level that produces the quality, safety, and outcomes of care, it is the ideal level for improvement and redesign activities. SATs not only make enhancements to patient safety, but also contribute to changing the safety culture of the organization through the completion of improvement projects at their clinical microsystem level. Cultural change would result because the SAT team members are changing their actions and behaviours. These new actions and behaviours conflict with the old values and assumptions, creating tension. To alleviate this tension, individuals would amend their values and assumptions to more closely align with the new behaviors. Various subcultures of the organization would be changed with the work of numerous SATs. Tension would develop with other areas whose culture is different, thus creating a driver for further organizational culture change.

However, in reviewing the literature and conducting the interviews, it became apparent that developing positive trajectories for SATs was not simply rooted in behavioural and cultural change, but also in the quality and flow of information. Indeed, the way an organization responds to and manages information is a marker of its safety culture. As demonstrated by the interviews, Safety Action Teams have a wealth of information about safety at their local level, including where the safety deficiencies lie and ideas on how they can be addressed. What happens to this information? In an organization with a culture of safety, an environment that was just and trusting would be present, safety information would be reported by front-line care providers, and the information would be used to learn about and make improvements to the organization and its care providers.

Unfortunately, in the majority of SATs interviewed, this important safety information is left and lost at the local level. Information flow is halted because of an absence of infrastructure or a social network to connect the information from the SAT to the rest of the organization. *SATs therefore will never be able to contribute to changing the culture of the organization until there is a well-defined structure and process for the flow of information.* How safety information is currently handled in the Region is consistent with Westrum's description of bureaucratic organizations. Progressing to a generative organization requires the implementation of global 'fixes', something that is virtually impossible without adequate communication structures and social networks.

The Calgary Health Region has traditionally taken an organization-centered approach to safety. Attention had been given to engaging leadership, articulating organizational values of quality and safety, and evaluating its safety culture through the administration of safety culture surveys. While these activities have been important for establishing the required organizational foundation to foster a safety culture, little attention had been paid

to establishing social networks and building community to facilitate sharing of information across the organization.

Currently in the Calgary Health Region, SATs would be best described as having a scattered fragment network. The teams exist predominantly in isolation from each other. Some teams interviewed had existing bonds or had developed links to other committees within their department, but because these were often strong ties, they did not foster sharing of *new* knowledge and information in the way that weak ties would. At certain times, the organization has functioned as a single hub/ weaver network; Quality Improvement Consultants and Clinical Safety Leaders became a hub, sharing information and ideas between SATs. However, as these individuals withdrew from their specific SATs after the initial start-up phase, links did not develop among the various SATs. The result was regression to a scattered fragment network.

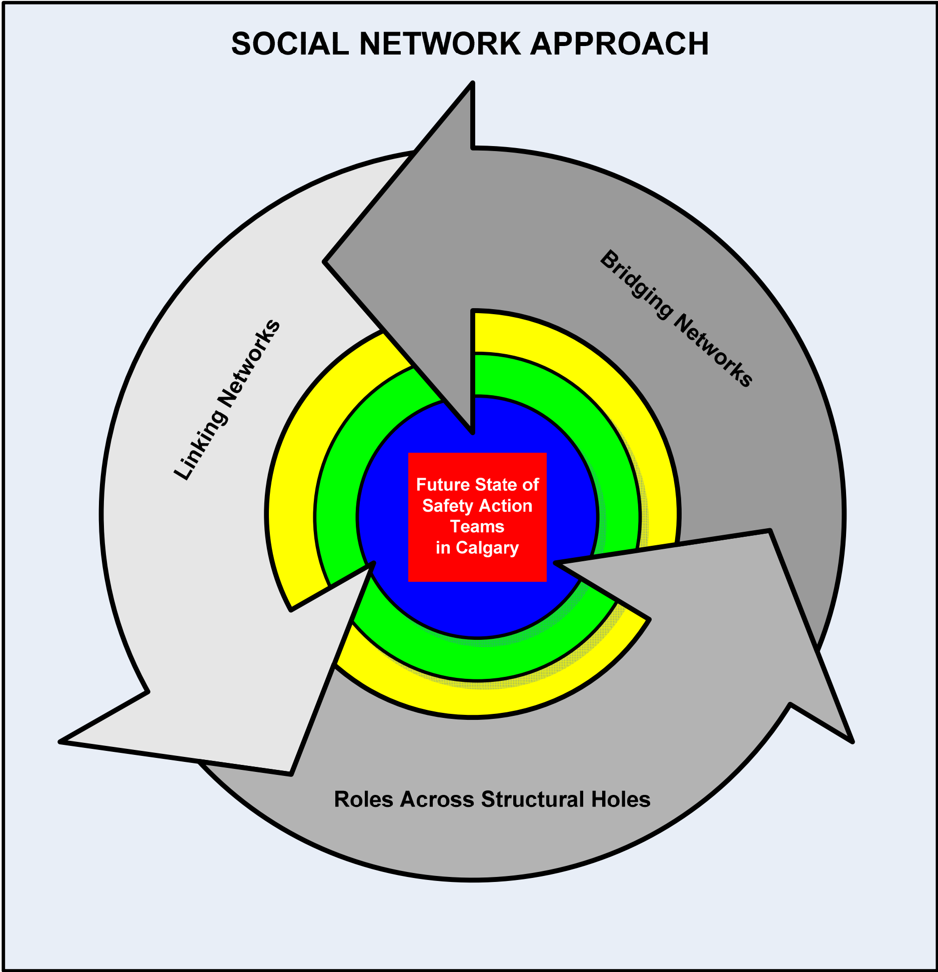
A network approach would better support SATs and facilitate the integration of their activities with other safety initiatives and Regional priorities. Such an approach would bring attention to building the necessary communication and social structures to facilitate sharing of safety-related information. Focus needs to be on establishing the 'weak ties' that foster exchange of *new* information and innovative ideas. The result of this social network approach could be an evolution from the current scattered fragment social network to a higher-functioning social network structure.

Figure 8 illustrates a general framework to conceptualize the transitioning of SATs from the current status in Calgary to a future state, essentially using a social network structure to foster the sharing of safety information. This approach includes three elements – bridging networks, linking networks, and roles across structural holes.

These elements are expected to foster development of 'weak ties'. Weak ties should facilitate greater knowledge exchange because of increased access to new ideas and new information. Figure 8 shows that levels currently influencing the SAT function still exist, which are illustrated as concentric circles. The external environment is the outside circle (yellow), the organizational environment is the middle circle (green), and the clinical microsystem level is represented by the inner circle (blue) where the SATs function.

Establishing the required social network should facilitate the sharing of information across these levels and between the various SATs. This will result in better integration with safety management activities across the organization, more innovative safety improvement activities at a local level, and enhanced safety culture.

Figure 8: Network Approach



In the next section, options and recommendations will be presented on how to implement a social network approach in the Region for Safety Action Teams.

OPTIONS AND RECOMMENDATIONS

The purpose of this project is to determine how to better support the work of the Safety Action Teams in the Calgary Health Region and to provide linkages between the teams' work with other Regional safety improvement activities. The Region's previous activities had taken on more of an organization-centered approach. There is a need to use a network-based approach in order to develop the required social structure for sharing of information. The concept of a social network is not new to the Region; a leadership network had been established for leaders, with a goal of fostering community and establishing connections among leaders who work in the various microsystems across the Region. Because of this previous experience and the immature social network currently in existence, it was thought that taking a social network approach to patient safety, and in particular to Safety Action Teams, would be optimal.

Using the social network approach articulated here, three aspects have been identified as opportunities for improvement: (1) bridging networks; (2) existing roles that function across the structural holes; and (3) linking networks. In the following section, different options for strengthening these three areas will be discussed, followed by an evaluation of the options by their strengths, weaknesses, resource needs, and time requirements. Finally, a recommendation for each of the three elements will be made.

Bridging Networks

Bridging networks, which are fostered by weak ties, are essential for enhancing social capital through the acquisition of new information and innovative ideas. As such, the ability of SATs to bring innovative change and to redesign work depends somewhat on the existence of bridging networks. Specific attention should be paid to facilitating the building of bridges among the various SATs, and to create bridges to resources and information beyond the normal work environment of the SAT. The result would be a social structure that will allow the SATs across the organization to share ideas and information easily and at their convenience. Bridging networks would also bring new ideas for improving the quality and safety of care from sources outside the organization to the SATs.

Option 1a: Technology-enabled connections

This approach connects the various SATs and facilitates sharing of information using technology, such as the Region's internal website (intranet). Resources, tools, and information could be posted on the web-site, allowing easy access to information for those members working shifts. For example, this could include information about quality improvement methodologies and their related tools, links to external websites with information on quality and safety, and tips for starting up and maintaining a SAT. As well, the Region's intranet could be used to foster bridges between the various SATs; a list of existing SATs, their key contacts, and improvement initiatives could be provided.

In addition, more advanced tools, such as blogs or web-boards, could be developed to allow members to connect and share information directly.

Option 1b: Face-to-face connections

This option, by providing regular venues, permits members of SATs to meet in-person. The venue could entail a meeting for all SATs, or smaller gatherings of SATs grouped either by their hospital site or by service provision. These gatherings could be informal or formal, and could also include the provision of educational opportunities. An example of a formal event is a poster presentation session for SATs where teams could showcase their work and then meet other teams. This session could be coupled with a presentation on patient safety, an additional opportunity for team members to learn more and gain new ideas.

Option 1c: Hybrid

This option entails having a combination of technology-enabled connections and face-to-face connections to establish bridging connections. Information and resources would be available on the internal web-site, allowing access when required and when convenient for the teams. Teams could meet at regular intervals, such as once or twice a year, to share ideas and information. Such a meeting could incorporate formal presentations on quality and safety, storyboards or posters to showcase activities of the various teams, time for informal networking, and possibly a recognition event for teams with exemplary improvements in their area. This approach is not intended to be a simple combination of everything in the technology-enabled and face-to-face connection options because the same amount of connections would not be required. For example, the intranet could be used to share specific information, such as a description of SAT purpose and mandate; a list of SATs, their contact information, and a list of their improvement initiatives; and links to resources and educational material. It would not need to include more complex tools such as blogs and web-boards because this type of information sharing could be accomplished through face-to-face venues. Moreover, face-to-face gatherings would not need to occur as often in the hybrid approach compared to only using face-to-face sessions because SATs can access information and resources through the intranet in-between sessions.

Roles across Structural Holes

Boundary-spanning roles already exist within the Calgary Health Region. These roles have cross-cutting ties to other networks and function across the structural holes between networks. Because these roles have weak ties to other networks, they become brokers of new ideas and facilitate knowledge exchange. Options presented below seek to strengthen these roles in order to support better integration and knowledge exchange for the SATs.

Option 2a: Health Outcomes Portfolio

Quality Improvement Consultants and Clinical Safety Leaders in the Health Outcomes portfolio support specific departments or portfolios. From this structure comes the option of ensuring that each SAT has an assigned Quality Improvement Consultant or a Clinical

Safety Leader. These individuals could provide expertise to SATs on quality and safety, and could function as a link to other SATs in the organization and to external sources. The Consultant or the Leader would provide support only; the members of the SATs would maintain responsibility for identifying and fixing safety hazards in their local level.

Option 2b: Clinical positions

This option entails identifying and strengthening the existing clinical roles in each clinical microsystem that function across the structural holes. These individuals hold positions within operational areas that provide clinical care, and are not located in the Health Outcomes portfolio. For example, some clinical nurse specialists provide care for patients across many different services and units. Because they function across the structural holes, they are in a position to bring new information and ideas to the various areas in which they work.

Linking Networks

Linking networks are vertical connections, important for building social capital primarily because they provide access to resources and support. The interviews indicated that some SATs had developed links with managers, leaders, and committees in order to access support and resources when required. Generally, representatives from the teams with such links felt well supported. They also appeared to be higher functioning in that they continued to make safety improvements regularly. Based on these observations, developing linking networks to vertical committees and positions should be fostered in the SAT network to ensure adequate support and resource allocation to all teams.

Option 3a: Operational committees

Operational-type committees exist throughout the departments and portfolios in the Calgary Health Region. Although agendas and discussion topics vary dramatically among committees, membership consists of operational leaders from the respective area. In this option, Safety Action Teams would link into an operational-type committee in an area. The SAT could provide information on safety issues and work in progress, bring management’s attention to issues beyond the scope of the team, and request support and resources when needed to implement changes.

Option 3b: Clinical safety committees

Another option is for SATs to link into the existing clinical safety committee structure. The clinical safety committee structure in the Calgary Health Region is responsible for performing quality assurance activities, including conducting safety analyses of close calls and patient harm events, and then proposing recommendations for safety improvements to operational leadership. The work and documents produced by these committees are protected from disclosure in a legal action under Section 9 of the Alberta Evidence Act (Queen’s Printer, 2008). In this option, SATs would become members of the clinical safety committee in their area to bring information on the safety issues they have identified and updates on their improvement activities.

Option 3c: Quality improvement councils

The third option to build linking networks is for Safety Action Teams to link into the quality improvement (QI) council in their area. Quality improvement councils include leaders and front-line workers from the multi-disciplinary team. The purpose of QI councils is to lead quality management for their department by setting the agenda for quality improvement, prioritizing improvement opportunities, conducting improvement activities, and monitoring performance. SATs could send a representative to the QI council in their area to allow two-way sharing of information; SATs could share information on safety issues identified and their improvement activities, and QI councils could provide information about the improvement initiatives they are undertaking.

Criteria for Evaluating Options

The options presented for the three elements were analyzed in two ways. First, a comparison on the strengths and weaknesses of each option was done. Second, options were analyzed according to their human and financial resource needs and time requirements.

Options were analyzed by their strengths and weaknesses (see Table 3). To establish bridging networks, three options were presented: technology-enabled connections, face-to-face connections, and a hybrid approach. The strength of the technology-enabled option is it would provide SAT members easy access to information, 24-hours a day, seven days a week. This is important in a shift-work environment so that information can be accessed when it is convenient and when workload permits. The weakness of this option is that technologies such as internet, blogs, web-boards and interactive tools may be intimidating and less appealing for some individuals. The strength of face-to-face connections is they are very effective in fostering relationship building, establishing a sense of community, and facilitating social network development. Face-to-face venues could also be coupled with story-board sessions, educational opportunities, and recognition events. The down-side of this option is that members may have difficulty participating because of shift-work and clinical workload demands that prevent attendance during scheduled work time. The hybrid approach would capitalize on the strengths of both the technology-enabled and face-to-face options. It also would bring redundancy and choice. No weaknesses were identified for this option.

To capitalize on the existing roles functioning across the structural holes, two options were discussed: Health Outcomes portfolio staff and clinical positions. The Health Outcomes portfolio has a long-standing record of successfully supporting safety initiatives and quality improvement teams. As well, the portfolio's staff is well-versed in safety and quality improvement, bring new information and innovative improvement ideas because of having weak ties to the SATs, and most importantly, have access to quality and safety resources and individuals external to the Region. No weaknesses were identified for this approach. The strength of the second option, using clinical positions, is that these roles could create links among similar areas during their day-to-day activities. However, the current work-load demands placed on clinical roles would make it difficult for these individuals to do this in addition to their clinical duties.

Three options were presented for establishing linking networks: operational committees, QI councils, and clinical safety committees. Using existing operational committees would provide the best and most efficient access to management support and resources. The weakness of this option is that it would not provide access to quality and safety expertise. Linking to clinical safety committees would provide access to safety expertise, but these committees could not allocate resources. There would also be a barrier to sharing information outside of the committee because of governing legislation (Alberta Evidence Act). The strength of using the QI councils is three-fold: (1) QI council purpose and activities most closely aligns with the work of SATs; (2) provision of quality improvement expertise to SATs; and (3) inclusion of SAT work into quality management and prioritization initiatives. The weakness is QI Councils cannot allocate resources.

Table 3: Analysis of Options: Strengths and Weaknesses

Element	Option	Strengths	Weaknesses
Bridging Networks	Technology-enabled	▪ Easy access, 24 hours a day (shift-workers) ▪ "One stop shopping"	▪ May be intimidating for some team members
	Face-to-face connections	▪ Effective in developing relationships and community ▪ Could be coupled with educational opportunity	▪ Difficulty attending for shift-workers ▪ Clinical workload demands
	Hybrid	▪ Strengths of both options ▪ Brings redundancy and creates choice	
Roles across Structural Holes	Health Outcomes Portfolio	▪ Proven ability to support SATs ▪ Existing connections to other SATs and to quality and safety resources internal and external to Region.	
	Clinical positions	Access to similar units	▪ Current workload demands on front-line staff
Linking Networks	Operational committees	Access to resources and support of management	▪ No access to safety and quality expertise
	Clinical safety committees	Expertise with safety management activities	▪ Activities protected under s.9 of Alberta Evidence Act ▪ Inability to assign resources
	Quality improvement councils	▪ SAT activities best align with councils' purpose ▪ Access to QI expertise ▪ Facilitates inclusion of SAT in quality management and prioritization	▪ Inability to assign resources

Next, the options were analyzed according to their resource and time intensiveness (see Table 4). For the three options in the bridging network element, the technology-enabled option had the least human, financial, and time requirements because existing roles and resources would be used. In contrast, the hybrid approach would require the greatest number of different individuals to be involved, but would require significantly less time than the face-to-face approach. In analyzing resource requirements for the two options presented for using roles that function across structural holes, there was no difference in time requirements; however additional costs would result from using clinical positions because of the need to pay for the unionized clinical staff to participate in SAT meetings. Lastly, to establish linking networks there were no differences in human or financial resources for the three options presented.

There were similarities in time commitments among the three options, with QI councils requiring slightly less time because their meetings are often shorter than operational and clinical safety committee meetings.

Table 4: Analysis of Options: Resource and Time Requirements

Element	Option	Resource Needs	Time Requirements
Bridging Networks	Technology-enabled	Human: ▪ Health Outcomes web-designer Financial: ▪ No direct costs because existing IT and human resources would be used	▪ Approx 1 month to set up ▪ Ongoing time to maintain website and post new items ▪ On-going time to monitor and respond to blogs or web boards
	Face-to-face connections	Human: ▪ Event coordinators ▪ Presenters Financial: ▪ Refreshments ▪ Rewards for recognizing exemplary teams ▪ Poster printing	▪ 2-3 months lee time to plan and organize (x 4/yr) ▪ Approx 20-30 hours of event coordinator time for registration, booking (x 4/ yr) ▪ Presenter preparation time (variable) ▪ Approx 16 hours of admin assistant time to print posters (x 4/yr)
	Hybrid	Human: ▪ Health Outcomes web-designer ▪ Regional Web Communications ▪ Event coordinators ▪ Presenters Financial: ▪ Refreshments ▪ Rewards for recognizing exemplary teams ▪ Poster printing	▪ Approx 2 weeks to set-up website ▪ Ongoing time to maintain website and post new items ▪ 2-3 months lee time to plan and organize face-to-face event (1-2/yr) ▪ Approx 20-30 hours of event coordinator time for registration, booking (1-2/ yr) ▪ Presenter preparation time (variable) ▪ Approx 16 hours of admin assistant time to print posters (1-2/yr)

Element	Option	Resource Needs	Time Requirements
Roles across Structural Holes	Health Outcomes Portfolio	Human: ▪ QI Consultants, Clinical Safety Leaders (existing) Financial: ▪ No direct costs because existing roles would be used that are salaried-positions (i.e. no over-time costs)	▪ Attend SAT meetings (approx 1 hr/ month / team)
	Clinical positions	Human: ▪ Clinical positions (existing) Financial: ▪ Payment of clinical positions to attend SAT meetings (union positions), with potential for over-time	▪ Attend SAT meetings (approx 1 hr/ month / team)
Linking Networks	Operational committees	Human: ▪ None Financial: ▪ None	▪ SAT representative time to attend operational committee (approx 2 hrs/ month)
	Clinical safety committees	Human: ▪ None Financial: ▪ None	▪ SAT representative time to attend operational committee (approx 2 hrs/ month)
	Quality improvement councils	Human: ▪ None Financial: ▪ None	▪ SAT representative time to attend operational committee (approx 1.5 hrs/ month)

Recommendations

Taking a social network approach means establishing numerous networks to provide connections among the various SATs and others within the organization, as well as establishing links to resources outside the organization. All three elements presented in the social network approach are important for building a robust social network system that would facilitate information exchange. By implementing all three elements, there is redundancy built in the structure so that if positions or committees change, SATs would not become isolated or unsupported.

Bridging Networks

The hybrid option is the preferred option. It would likely be most effective in regards to information exchange and have the greatest reach because teams could choose the method that worked best for them. A hybrid-approach would also build redundancy. Relying only on face-to-face meetings is the least preferred option because of current workload and staffing constraints facing health professionals, challenges in attending face-to-face meetings for shift workers, and significant financial, human, and time requirements for Health Outcomes. The technology-enabled option would likely be fairly effective in facilitating information exchange among SATs, but is thought to be less effective than the hybrid option because some members are less comfortable in using technology. Also, giving SATs the additional opportunity to meet other teams face-to-face would assist in relationship development and building a sense of community.

Roles Across Structural Holes

It is recommended that individuals in the Health Outcomes portfolio be targeted as the roles that function across the structural holes in the network. This recommendation is based on two reasons. First, there would not be any additional financial or human resource requirements. Second, these individuals are in an ideal position to function across the structural holes because of the nature of their roles and the portfolio's mandate. In the past, some individuals from Health Outcomes supported the teams, functioning as hubs within the social network. There is a logical progression to include the role of leader/ weaver for these roles, as well as establishing Health Outcomes as a core within the social network.

Using existing clinical positions would be difficult for many reasons. First, each clinical microsystem would have a different role that functions across the holes and that has cross-cutting ties to other networks. Establishing the role in each area would be extremely resource-intensive. Second, because of the high workload demands and the human resource constraints that currently exist in healthcare, relying on individuals with an already-full clinical workload would not be feasible and would result in increased cost.

Linking Networks

It is recommended that linking networks be established between the SATs and the QI councils. While there were no differences in human or financial resource needs in the three options, linking networks form the preferred option because the activities of the SATs best aligns with the work of the QI councils. Linking with the QI Councils would provide SATs access to quality improvement expertise. It would also ensure that opportunities for improvement beyond the scope of a SAT or requiring additional resources could be prioritized along with other departmental improvement opportunities. Clinical safety committees were not the preferred option because of the governing legislation that prevents wide distribution of meeting minutes and open sharing of information discussed at a meeting.

Summary

A three-part approach is necessary to establish the required social network structure to facilitate information exchange and provide support to SATs. These three elements create different structures and processes within the social network. Various options have been presented for the three different elements. Options were analyzed according to their strengths and weaknesses, as well as their resource and time requirements. By performing this analysis, a recommendation was made for each element: a hybrid approach for building bridging networks; using staff in the Health Outcomes portfolio as the roles to function across the structural holes; and linking SATs to QI councils.

In the next section, implementation strategies will be presented.

IMPLEMENTATION STRATEGIES

The options and recommendations presented will assist in establishing a social network to support the sharing of safety information among SATs and across the Calgary Health Region. This section is dedicated to discussing implementation strategies. First, specific direction on how to plan and manage the implementation of the recommendations will be presented. Following this will be a discussion on strategies for strengthening the social network approach by addressing factors identified in the conceptual framework. The section will conclude with a discussion on further evaluation work recommended.

Planning and Managing Implementation

Implementation of the social network approach will require planning and management. Approval from Health Outcomes Executive is required prior to starting on specific implementation steps. It would be impossible to implement all three elements simultaneously because of the significant human resource requirements, especially for the Health Outcomes portfolio. Sequencing is critical.

It is recommended that the first priority should be to establish adequate bridging networks. These networks are critical for sharing new information and innovations among the teams, and for connecting the SAT activities with organization-wide safety management activities. A second reason is that bridging links can be established effectively and efficiently in the current environment because the clinical microsystem level has been left untouched by the AHS restructuring. The work to establish bridging networks can be completely managed within the Health Outcomes portfolio.

To establish the bridging networks, the technology-related structure should be established first because it is less resource-intensive and can be a ‘quick win’. A page within the Health Outcomes’ web-site could be established specifically for SATs. A brief description of the purpose and mandate of SATs can be included along with a list of teams, their contact information, and current improvement projects. Resources, educational information, articles, and links to informative websites can be added.

The next logical step would be to match Health Outcomes staff to specific SATs, and then to establish a link between each SAT and a QI Council. The latter step will create the linking networks. Staff from the Health Outcomes portfolio will be set up to function across the structural holes by creating the website and by matching Health Outcomes staff to specific teams. The last step in implementing the social network approach will be to hold an event to further establish bridging networks through a face-to-face venue. This venue could be seen as a celebration event, highlighting the work of the SATs, recognizing teams with exemplary improvements, and providing presentations on topics relevant to the SATs.

Addressing Conceptual Framework Factors

The conceptual framework illustrates the various factors that influence the function of SATs in the Calgary Health Region. Attention must also be given to these factors, in addition to establishing the social network recommended in this paper. In particular, the following supporting and driving factors should be enhanced and strengthened:

- leadership and management engagement;
- access to expertise on quality and safety; and
- information from the Safety Learning Reporting System and data on performance measurement.

Barriers and challenges should be minimized where possible in order to further increase the effectiveness of the SATs. Of particular significance is addressing the current education and training gap identified by interview participants.[5]

Leadership and Management Engagement

Leadership engagement in safety is well recognized as being a driver of safety culture and organizational change. Management support was mentioned by most of the interviewees as being a key factor in SAT success. It is important to remember that the philosophy of the SATs is to establish a 'bottom-up' approach in order to engage and empower staff at the 'sharp end' of the system. Thus, appropriate awareness, support, and engagement of the management and executive levels of the organization are necessary, while at the same time ensuring that SATs remain front-line led and driven.

One way leadership support and engagement could be strengthened and displayed is by assigning specific roles to leaders during the celebration event. Leaders could give presentations and award exemplary SATs. Another option is to clearly articulate management's role in SATs; this information could be communicated on the web-page along with the other information describing SAT purpose and function.

Access to Quality and Safety Expertise

Many team members interviewed recognized that having access to expertise in quality and safety was instrumental to success. This should be provided at the initial start-up phases for a SAT, when the team is unsure of how to determine which safety issues to fix. Provision of quality and safety expertise would also be beneficial on an ad hoc basis to support teams struggling to make changes or requiring assistance for specific tasks. This support could be established by implementing two of the recommendations – using Health Outcomes portfolio staff to function across the structural holes and linking SATs to QI Councils. It is recommended that Health Outcomes portfolio staff be strongly connected to SATs during the initial team formation stages, then have decreasing involvement to a level that provides support while also allowing appropriate transition of leadership to the SAT leader. In addition, a standardized quality improvement tool set should be used to facilitate identification of safety issues and prioritization.

---

[5] The challenge / barriers of workload and staff turn-over were not addressed in an implementation strategy because it is felt these factors are not limited to the areas with SATs. It was also not addressed in this paper because corporate-wide initiatives have been launched to address them.

Information and Performance Measurement

Having performance measurement data is also a key part of a successful quality improvement strategy. Safety Action Teams would greatly benefit from having assistance in acquiring data on process and outcome measures related to patient safety in their area. Measurement expertise and assistance can be accessed through the Survey and Evaluation unit of the Health Outcomes portfolio. Information about hazards and hazardous situations in their areas that have been reported to the Safety Learning Reporting System is also important to assist with the identification of safety issues, prioritization, and ongoing monitoring. The Clinical Safety Evaluation unit can create summary reports outlining the most frequently reported problems and narrative descriptions.

SATs also require information about safety activities that are occurring at a Regional level, initiatives that are being undertaken by other SATs, and information on new, innovative ideas for safety improvement. This will be achieved by implementation of two of the recommendations: the bridging network recommendation, using both technology-enabled and face-to-face connections; and establishing Leaders and Consultants as roles that function across the structural holes.

Education and Training

A key challenge and barrier identified during the interviews was variability in knowledge and skills in team leaders and team members. Specific areas of required knowledge that were mentioned include: facilitation and leadership skills for the leader, computer skills, and knowledge about quality improvement methodology. Courses are currently available in the Region that would help address this gap. However, it is possible that staff are either not aware of them or have not had the ability to attend. Currently there are no links between specific roles in the Region and courses that would help support these roles. Therefore, it is recommended that information about courses available in the Region that would be beneficial to SATs be included on the SAT-dedicated web-page.

Sequencing and accountability for the implementation of the recommendations and the steps for addressing the factors are outlined in Table 5.

Table 5: Implementation of Recommendations

Priority	**Quarter 4 2008 – 2009**	**Quarter 4 2008 - 2009**	**Quarter 1 2009 - 2010**	**Quarter 1 2009 - 2010**	**Quarter 1 2009 - 2010**	**Quarter 2 2009 - 2010**
Purpose	Planning and managing	Bridging networks Roles across structural holes	Roles across structural holes	Linking networks	Information and performance measures	Bridging networks
Activity	Discuss options, recommendations and agree on plan	Create website	Match Health Outcomes staff to specific SATs	Establish links from SATS to QI Councils	Provide summary reports from Safety Learning Reporting System	Hold ‘celebration event’
Accountability	Health Outcomes Executive	Health Outcomes web author Clinical Safety Evaluation	Quality and Safety	Quality and Safety	Clinical Safety Evaluation	Quality and Safety Learning Center
	Provision of expertise and assistance in capturing process and outcome measures on-going by Survey and Evaluation unit.					

Evaluation

Measurement and evaluation is a basic principle of continuous quality improvement. The plan for implementing the social network approach presented in this paper needs to include an evaluation strategy. Evaluation is important for ensuring appropriate allotment of limited quality and safety resources in the Calgary Health Region. An overall evaluation of SATs once recommendations have been implemented is an opportunity for additional research. Three specific variables should be measured in the over-all evaluation: (1) information exchange among SATs; (2) SAT members' perception of support; and (3) integration of SAT activities and regional-level safety initiatives. This could be achieved through SAT members participating in interviews, surveys, or focus groups.

In addition to the over-all evaluation, consideration should be given to measuring specific recommendations and implementation activities. For example, at the 'celebration event', evaluation forms can be used to gain feedback from SAT members on the educational content and the effectiveness of the venue for creating an opportunity for information exchange, networking, and relationship building. Feedback on the SAT website could also be gathered so that changes and enhancements can be made to improve usability and to ensure the website is meeting the needs of the SATs.

Finally, the Region is encouraged to continue conducting the safety culture survey across the organization on a biennial basis. Changes in safety culture could not be attributed to SATs specifically because of numerous other factors that influence culture. However, continually monitoring safety culture will provide valuable information to leadership about the organizational culture while also keeping a focus on patient safety.

The implementation plan presented earlier (Table 5) has been expanded in recognition of the need to conduct evaluation (see Table 6).

Table 6: Implementation of Recommendations: Revised to Include Evaluation

Priority	**Quarter 4 2008 – 2009**	**Quarter 4 2008 - 2009**	**Quarter 1 2009 - 2010**	**Quarter 1 2009 - 2010**	**Quarter 1 2009 - 2010**	**Quarter 2 2009 - 2010**	**Quarter 4 2009 - 2010**
Purpose	Planning and managing	Bridging networks Roles across structural holes	Roles across structural holes	Linking networks	Information and performance measures	Bridging networks	Evaluation
Activity	Discuss options, recommendations and agree on plan	Create website	Match Health Outcomes staff to specific SATs	Establish links from SATS to QI Councils	Provide summary reports from Safety Learning Reporting System	Hold ‘celebration event’	Conduct evaluation of SATs
Accountability	Health Outcomes Executive	Health Outcomes web author; Clinical Safety Evaluation	Quality and Safety	Quality and Safety	Clinical Safety Evaluation	Quality and Safety Learning Center	Survey & Evaluation
	Provision of expertise and assistance in capturing process and outcome measures on-going by Survey and Evaluation unit.						

Summary

The recommended process shows one vision for implementation of SAT improvements in the Calgary Health Region. Planning and approval from Health Outcomes Executive is a required first step. In this plan, recommendations are implemented over three quarters, with support for capturing process and outcome measures occurring throughout. To effectively implement the recommendations, there needs to be focus on the challenges and barriers and the drivers and supporters that influence SAT function. These specific factors include: management and leadership engagement; access to quality and safety expertise; information and performance measurement; and education and training.

A general evaluation of the social network approach should be required after full implementation of the recommendations and strategies to ensure appropriate allocation of quality and safety resources in the Region. Variables for measurement include: information exchange among SATs; SAT members' perception of support; and integration of SAT activities and regional-level safety management activities. A general evaluation should be conducted two quarters after the last element has been implemented. Feedback on specific recommendations and implementation activities should also be gathered so that improvements can be made throughout implementation. The safety culture survey should continue across the organization on a biennial basis.

By implementing the recommendations, strengthening the network through specific strategies, and conducting evaluations to support continuous improvement, a robust social network can be established in the Calgary Health Region. With the strengthening of the social network for SATs, information can be better shared among teams and across the organization, and SATs can receive the necessary support, resources, and expertise.

CONCLUSION: SUPPORTING AND INTEGRATING SATS

Improvements to patient safety depend on the sharing of information. Only when sufficient sharing of information across an organization occurs can the threats to the safety of patients be effectively identified, analyzed, and addressed at an organizational level. Safety Action Teams are one initiative aimed at making care safer for patients. Working at the clinical microsystem level, they have a wealth of information about patient safety within their local environment. However, in the Calgary Health Region, there is a lack of structures and processes to facilitate sharing important safety information. This means safety information is often left and lost at the local level. Information about large Region-wide safety initiatives does not reach the SATs. As a result, SATs function in isolation from each other and in isolation from other important safety work occurring at a Regional level.

The purpose of the project was to conduct an analysis of SATs and to develop recommendations to better support the teams and to integrate their activities with quality and safety management initiatives across the Region. Through an extensive literature review and conducting interviews of SAT members, numerous factors were identified that impact the function of SATs. Factors were found at three levels – external to the organization, at the organizational level of the Calgary Health Region, and at the clinical microsystem level where the SATs function. These factors were seen to be drivers and supporters or challenges and barriers. Moreover, SATs are influenced by various cultures, subcultures, and local climate, which may be either enablers or barriers to effective SAT function. The conceptual framework presented in this paper illustrates these factors and cultural influences.

A social network approach was recommended as a framework to examine how to adequately support SATs in their local improvement work and to better integrate their activities with the work of various teams and other related organizational initiatives. Strengthening networks around SATs could create the support, communication channels, and the necessary relationships to facilitate information and knowledge exchange across the Region. In particular, focus needs to be on developing ‘weak ties’ to facilitate acquisition of *new* information and innovative ideas. The three elements for doing so include: (1) building linking networks; (2) creating bridging networks; and (3) using roles that currently function across the structural holes. This approach should establish a social network structure, thus creating different relationships, and with it, access to innovative ideas, new information, support and resources to the SATs.

An implementation strategy was presented to describe the sequential steps required for implementing the recommendations. The strategy outlined implementation activities to occur over three quarters, with accountability for each activity lying with various units in the Health Outcomes portfolio. Additional strategies were identified to anticipate and address factors found in the conceptual framework, including: leadership and management engagement; access to quality and safety experts; information and

performance management; and education and training. Finally, further evaluation work is recommended. Three different types of evaluation were recommended:

- gathering feedback on specific recommendations and strategies throughout the implementation process;
- undertaking an overall evaluation of SATs after full implementation, focused on measuring the variables of information exchange among SATs across the Region, SAT members perception of support, and integration of SAT activities and regional safety initiatives; and
- continuing with the Region-wide safety culture survey on a biennial basis.

By taking a social network approach and strengthening it with the implementation strategies, it is thought an adequate social network structure can be established within the Region to better support the SATs and to integrate their activities with the work of other teams and with related Region-level initiatives. As they continue on their patient safety journey, the Calgary Health Region has the ability to make significant improvements to the safety of patients if a supporting social network is established that facilitates sharing of safety information.

REFERENCES

Accreditation Canada. (2008). *About us.* Ottawa, Ontario: author. Retrieved July 7, 2008 from http://www.cchsa.ca/default.aspx?page=66&cat=2

Alberta Health & Wellness. (2007). *Health regions.* Edmonton, Alberta: Government of Alberta. Retrieved November 18, 2007 from http://www.health.gov.ab.ca/regions/RHA_home.html

Alberta Health & Wellness. (2008). *Health Services.* Edmonton, Alberta: Government of Alberta. Retrieved July 7, 2008 from http://www.health.alberta.ca/regions/HS_home.html

Baker, G.R., Norton, P.G., Flintoft, V., et al. (2004). The Canadian adverse events study: The incidence of adverse events among hospital patients in Canada. *CMAJ, 170*(11): 1678-1686.

Barach, P., & Johnson, J.K. (2006). Understanding the complexity of redesigning care around the clinical microsystem. *Qual Saf Health Care, 1*5(Suppl I): i10-i16.

Beer, M., Eisenstat, R.A., & Spector, B. (1990). Why change programs don't produce change. *Harvard Business Review*, 1598-1566.

Behal, R. (2004). An organizational development framework for transformational change in patient safety: A guide for hospital senior leaders. In Barbara J. Youngberg and Martin Hatlie (eds) *The Patient Safety Handbook.* Sudbury, MA: Jones and Bartlett Publishers, Inc.

Calgary Health Region. (2006). *Reporting harm, close calls, and hazards.* Retrieved November 30, 2008 from http://www.calgaryhealthregion.ca/policydb/ShowPolicy?policy_id=1626

Calgary Health Region. (2008) *Quick facts.* Calgary, Alberta: author. Retrieved November 18, 2007 from http://www.calgaryhealthregion.ca/corporate/about_us/pdf/quickfacts.pdf

Canadian Patient Safety Institute. (2005). *About us*. Ottawa, Ontario: author. Retrieved July 9, 2008 from http://www.patientsafetyinstitute.ca/about.html

Carol, J.S., & Quijada, M.A. (2004). Redirecting traditional professional values to support safety: Changing organizational culture in health care. *Qual Saf Health Care, 13* (Suppl II): ii16-ii21.

Davies, H.T.O., Nutley, S.M., & Mannion, R. (2000). *Quality in Health Care, 9*: 111-119.

Flemons, W.W., Eagle, C.J.,& Davis, J.C. (2005). Developing a Comprehensive Patient Safety Strategy for an Integrated Canadian Healthcare Region. *Healthcare Quarterly, 8* (special issue): 122-127.

Flin, R. (2003). "Danger- Men at Work": Management influence on safety. *Human Factors and Ergonomics in Manufacturing, 13*(4): 261-268.

Flin, R., Burns, C., Mearns, K., Yule, S., & Robertson, W.M. (2006). Measuring safety climate in health care. *Qual Saf Health Care, 15*: 109-115.

Flin, R., & Yule, S. (2004). Leadership for safety: Industrial experience. *Qual Saf Health Care, 13* (Suppl II): ii45-ii51.

Frankel, A.S., Leonard, M.W., & Denham, C.R. (2006). Fair and just culture, team behavior, and leadership engagement: The tools to achieve high reliability. *Health Services Research, 41*(4): 1690-1709.

Garcia, A.M., Boix, P., & Canosa, C. (2004). Why do workers behave unsafely at work? Determinants of safe work practices in industrial workers. *Occup Environ Med* 61: 239-246.

Goodman, G.R. (2003). A fragmented patient safety concept: The structure and culture of safety management in healthcare. *Hospital Topics* 81 (2): 22-29.

Government of Alberta. (2008, April 16). *News release: Government launches aggressive action plan to make public health system more efficient and ensure equitable access to services*. Edmonton, Alberta: Author. Retrieved July 7, 2008 from http://alberta.ca/acn/200804/233275791DEAD-C59D-FD03-CA9E332EF8509BDB.html

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology, 78*: 1360-1380.

Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *Sociological Theory, 1*: 201-203.

Health Quality Council of Alberta. (2008). *Mandate*. Calgary, Alberta: author. Retrieved July 9, 2008 from http://www.hqca.ca/index.php?id=%2025

Helmreich, R.L. & Merritt, A.C. (2001). *Culture at work in aviation and medicine: National, organizational, and professional influences.* Aldershot, England: Ashgate Publishing Limited.

Henriksen, K., & Dayton, E. (2006). Organizational silence and hidden threats to patient safety. *Health Services Research, 41* (4): 1539-1554.

Hofstede, G. (1991). *Software of the mind*. Maidenhead, UK: McGraw-Hill.

Hooke, C. Safety Action Teams: Improving Care for Children with Cancer. *Journal of Pediatric Oncology Nursing,* 2002, 19(2) 59.

Hopkins, A. (2002). *Safety culture, mindfulness and safe behaviour: Converging ideas?* Canberra, Australia: Australian National University. Retrieved April 29, 2008 from http://dspace.anu.edu.au/bitstream/1885/41764/2/Working%20Paper%207.pdf

Institute of Medicine (2000). *To err is human: Building a safer health system.* Washington, D.C.: National Academy Press.

Kernaghan, K., & Siegel, D. (1999). *Public administration in Canada: A text, 4th ed.* Scarborough, Ontario: ITP Nelson.

Krebs, V., & Holley, J. (2002). *Building smart communities through network weaving.* Retrieved February 18, 2008 from http://www.orgnet.com/BuildingNetworks.pdf

Mearns, K., Whitaker, S.M., & Flin, R. (2003). Safety climate, safety management practice and safety performance in offshore environments. *Safety Science, 41*: 641-680.

Mohr, J.J., & Batalden, P.B. (2002). Improving safety on the front lines: The role of clinical microsystems. *Qual Saf Health Care, 11*: 45-50.

Mohr, J.J., Batalden, P., & Barach, P. (2004). Integrating patient safety into the clinical microsystem. *Qual Saf Health Care, 13* (Suppl II): ii34-ii38.

Morath, J.M. (2004). The leadership role of the Chief Operating Officer in aligning strategy and operations to create patient safety. In Barbara J. Youngberg and Martin Hatlie (eds) *The Patient Safety Handbook.* Sudbury, MA: Jones and Bartlett Publishers, Inc.

Morath, J., & Leary, M. (2004). Creating safe spaces in organizations to talk about safety. *Nursing Economic$, 22*(6): 344-354.

Morath, J.M., & Turnbull, J.E. (2005). *To do no harm: Ensuring patient safety in health care organizations.* San Francisco, CA: John Wiley & Sons, Inc.

Mosher, F.C. (1995). *Democracy and the public sector, 2nd ed.* New York, NY: Oxford University Press.

National Steering Committee on Patient Safety. (2002). *Building a safer system: A national integrated strategy for improving patient safety in Canadian healthcare.* Ottawa, Ontario: author. Retrieved July 8, 2008 from http://rcpsc.medical.org/publications/building_a_safer_system_e.pdf

Pidgeon, N., & O'Leary, M. (1995). Organizational safety culture and aviation practice. In Nick McDonald, Neil Johnston, & Fary Fuller (eds) *Applications of Psychology to the Aviation System: Proceedings of the 21st Conference of the European Association for Aviation Psychology (EAAP).* Aldershot, England: Avebury Aviation.

Policy Research Initiative. (2007). *Social capital – Overview*. Ottawa, Ontario: Government of Canada. Retrieved February 19, 2008 from http://www.policyresearch.gc.ca/page.asp?pagenm=rp_sc_index

Queen's Printer. (2008). *Alberta evidence act.* Edmonton, Alberta: Government of Alberta. Retrieved December 6, 2008 from http://www.qp.gov.ab.ca/Documents/acts/A18.CFM

Ramanujam, R., & Rousseau, D.M. (2006). The challenges are organizational not just clinical. *Journal of Organizational Behavior* 27: 811-827.

Reason, J. (1990). *Human error.* Cambridge, UK: Cambridge University Press.

Reason, J. (1995). Understanding adverse events: Human factors. *Qual Saf Health Care, 4*: 80-89.

Reason, J. (2000). Human error: Models and management. *British Medical Journal* 320: 768-770.

Reason, J. (2005). Safety in the operating theatre- Part 2: Human error and organizational failure. *Qual Saf Health Care, 14*: 56-61.

Reason, J., & Hobbs, A. (2003). *Managing maintenance error: A practical guide.* Aldershot, England: Ashgate Publishing Company.

Ruchlin, H.S. (2004). The role of leadership in instilling a culture of safety. *Journal of Healthcare Management, 49*(1): 47-58.

Schein, E.H. (1990). Organizational culture. *American Psychologist, 45*(2): 109-119.

Scott, C., & Hofmeyer, A. (2007). Networks and social capital: A relational approach to primary healthcare reform. *Health Research Policy and Systems, 5*:9. Retrieved February 18, 2008 from http://www.health-policy-systems.com/content/pdf/1478-4505-5-9.pdf

Vanderheyden, L.C., Northcott, H.C., Adair, C.E., McBrien-Morrison, C., Meadows, L.M., Norton, P., & Cowell, J. (2005). Reports of preventable medical error from the Alberta patient safety survey 2004. *Healthcare Quarterly, 8*: 107-114.

Vincent, C. (2006). *Patient Safety*. London, England: Churchill Livingstone Elsevier.

Westrum, R. (1993). Cultures with requisite imagination. In J. Wise, P. Stager, & J. Hopkin (Eds.). *Verification and validation in complex man-machine systems.* New York, N.Y.: Springer-Verlag.

Westrum, R. (1995). Organizational dynamics and safety. In Nick McDonald, Neil Johnston, & Fary Fuller (eds) *Applications of Psychology to the Aviation System: Proceedings of the 21st Conference of the European Association for Aviation Psychology (EAAP).* Aldershot, England: Avebury Aviation.

Westrum, R. (1996). Human factors experts beginning to focus on organizational factors in safety. *ICAO Bulletin, 51*(8): 6-8, 26-27.

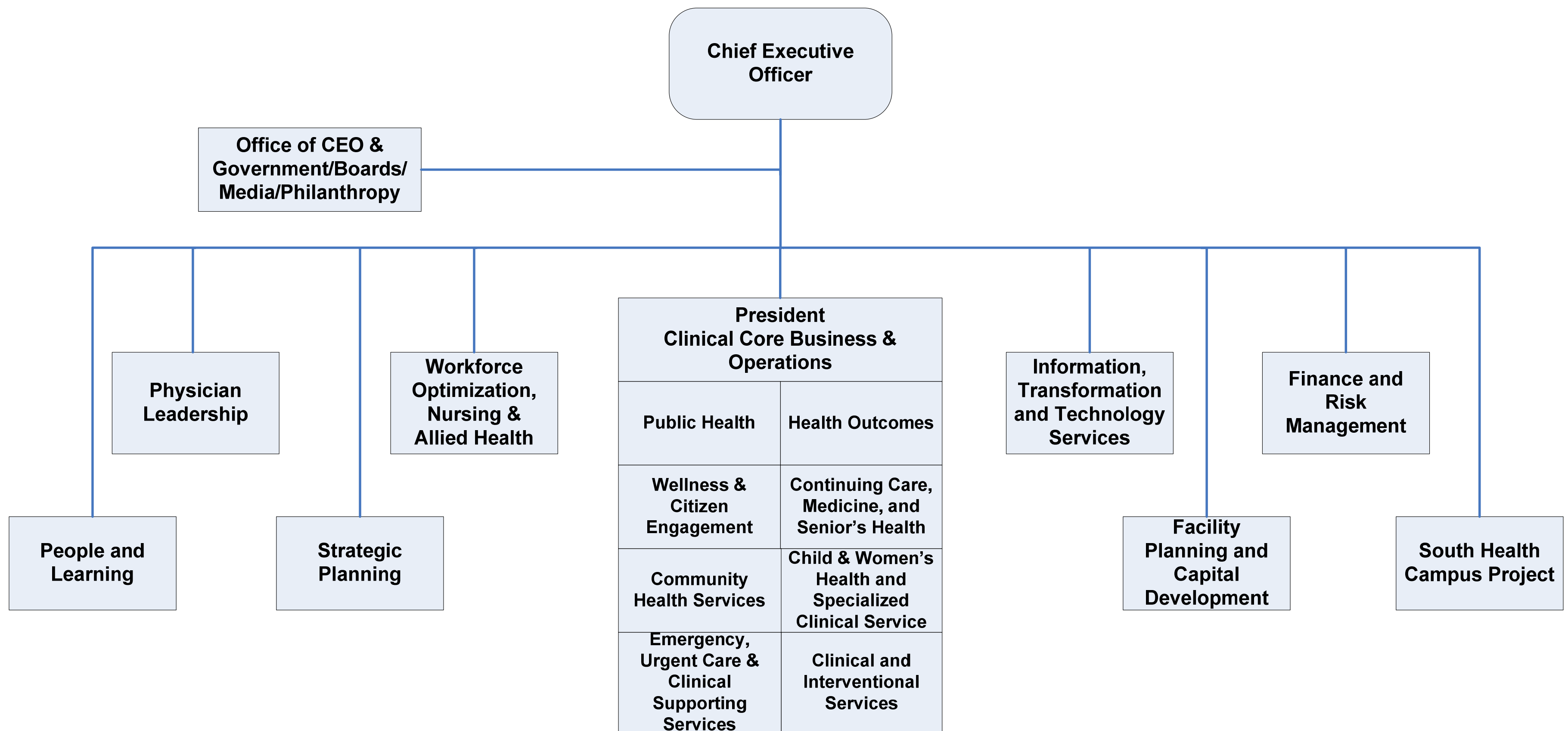
Westrum, R. (2004). A typology of organizational cultures. *Quality & Safety in Health Care* 13: ii22-ii27.

Wikipedia. (2008). *Social capital.* Retrieved December 6, 2008 from http://en.wikipedia.org/wiki/Social_capital

Woolcock, M. (2001). The place of social capital in understanding social and economic outcomes. *Isuma: Canadian Journal of Policy Research* 2:1, pp 1-17. Retrieved May 4, 2008 from http://142.236.154.1/sp-ps/arb-dgra/publications/books/oecd/en/5-woolcock.pdf

Zboril-Benson, L.R., & Magee, B. (2005). How quality improvement projects influence organizational culture. *Healthcare Quarterly* 8, 26-31.

Appendix ‘A’ - Calgary Health Region Organizational Structure 2008



Appendix ‘B’ - Request to Participate

To Whom It May Concern:

I am a Calgary Health Region employee and a graduate student in the School of Public Administration at the University of Victoria. Masters of Public Administration students are required to conduct research for *ADMN 598* as the final requirement for graduation.

Glenn McRae, Director of Quality & Safety (QSHI) has agreed to serve as client for my project *Improving Safety Management: A Plan for Integrating Safety Action Teams in the Calgary Health Region*. Professor Evert Lindquist, Director and Professor in the School of Public Administration at the University of Victoria, is my supervisor.

I would appreciate your participation in an interview on the topic of Safety Action Teams. I believe your participation will assist me in understanding Safety Action Teams in the Calgary Health Region so I can develop recommendations as to how to better support the teams and integrate the work into safety management.

I will maintain the confidentiality of all information gathered during the interview. Any comments you make will not be attributed to you in the final report. Only Professor Lindquist will have access to the interview notes, which will be kept in a secure place. Once the final report is completed, these records will be destroyed.

If you have any questions, please do not hesitate to contact me at 944-8350 or by e-mail at Carmella.Duchscherer@Calgaryhealthregion.ca. If you wish to contact my supervisor, Professor Evert Lindquist, he can be reached at (250) 721-8084 or evert@uvic.ca.

I look for forward to meeting and working with you.

Sincerely,

Carmella Duchscherer

cc. Professor Evert Lindquist, Director
School of Public Administration

Appendix 'C' – Consent Form

UNIVERSITY OF VICTORIA
SCHOOL OF PUBLIC ADMINISTRATION

PARTICIPANT CONSENT FORM

Improving Safety Management:
A Plan for Integrating Safety Action Teams in the Calgary Health Region

You are being invited to participate in a project titled *Improving Safety Management: A Plan for Integrating Safety Action Teams in the Calgary Health Region*. The field research project is being conducted by Carmella Duchscherer, a graduate student at the University of Victoria.

As a graduate student, I am required to conduct research for *ADMN 598* as the final requirements for a degree in Masters of Public Administration. My supervisor is Professor Evert Lindquist, Director and Professor in the School of Public Administration at the University of Victoria.

Purpose and Objectives
This project is being sponsored by Glenn McRae, Director of Quality & Safety (Quality Safety & Health Information). The purpose is to conduct an analysis of Safety Action Teams (SATs) in the Calgary Health Region and to develop recommendations of how to better integrate the work of these teams into safety management. You are being asked to participate in this project because you can provide important information about SATs.

What is Involved
If you agree to voluntarily participate in this project, you will be asked to participate in an interview on the topic of SATs within the Calgary Health Region. The interview will be about 30-45 minutes in length, and will be conducted by myself.

Participation in the interview is entirely voluntary. You may withdraw at any time without any consequences or any explanation. If you withdraw from the interview, your data will only be used if you give permission. There are no known or anticipated risks to you by participating in this research.

Confidentiality
There are some limits to participant confidentiality, as it will be known that information has been gathered from members of SATs, and also because potential participants will be referred by other members of SATs or QSHI staff. However, to protect your identity as much as possible, the information you provide will be confidential. Data will be presented in aggregate form and will not be attributed to individual participants. Data collected during the interviews will be used in the project's final report and also in presentations / oral defense. An article in a scholarly publication may also be used to disseminate data.

If you have any questions about this project, please contact me at carmella.duchscherer@calgaryhealthregion.ca. or 944-8350. You may also contact Professor Lindquist at (250) 721-8084 or evert@uvic.ca.

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researcher.

____________________	____________________	____________________
Name of Participant	*Signature*	*Date*

Should I decide to withdraw from the study at any time, I give permission to Carmella Duchscherer to use any information of mine gathered to that point.

☐ **Yes** ☐ **No**

A copy of this consent from will be left with you and the researcher will take a copy.

Appendix 'D' – Interview Questions

SAT Demographics and Function:

1. What SAT are you a member of?

2. How long have you been a member of this SAT, and how long has the SAT been in existence?

3. How did you hear about the concept of SATs?

4. What is your role (member, chair)?

5. How many members are there, and what disciplines are represented?

6. Does the team have regular meetings? If so, how often, how long do they last, and what is the style (huddles versus formalized meetings)? What would a typical meeting agenda include?

7. What involvement does the manager have?

8. Are you aware of any other SATs in the Region? If so, do you share information? How does your SAT differ from the others you know about?

SAT Activities

1. Can you describe some of the activities the team has done (prompts if necessary- review incident reports/ good catch reports; fish-bone diagrams; flowmaps, etc.)

2. If the team identifies a safety problem, what do they do?

3. If the team fixes something, what do they do?

4. What are some examples of safety improvement work your team has done?

5. What are some of the challenges your team has had to deal with?

SAT Support and Integration

1. Do you feel your team has adequate support to make safety improvements? If no, what suggestions do you have?

2. Have you had assistance / support from a QI Consultant or a Clinical Safety Leader? If so, what kind of support?

3. Do you have suggestions on how other SATs could be better connected with other teams and integrated with other safety and quality improvement work?