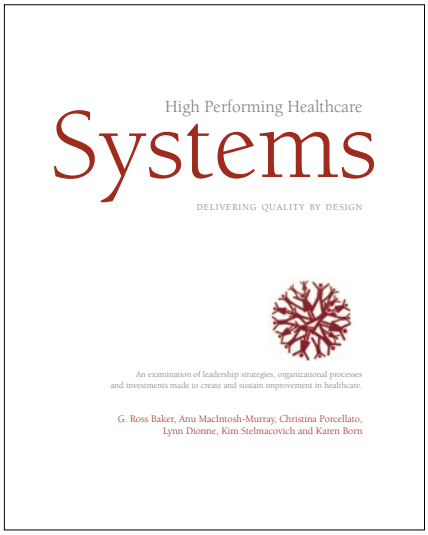
High Performing Healthcare Systems

DELIVERING QUALITY BY DESIGN

Chapter 7
Calgary Health Region



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Calgary Health Region

Calgary, Alberta

Background

Calgary Health Region (CHR) is one of nine health regions in the province of Alberta. Regionalization in Alberta began in 1993, motivated by financial and quality goals. Provincial leaders believed that regional governance could generate cost savings and improved healthcare services through economies of scale and coordination of services (Watson Wyatt Worldwide 1999). Initially Alberta created 17 regional health authorities (RHAs) responsible for the planning and delivery of hospital-based, continuing, community-based and public healthcare services. In 2003 the 17 RHAs were consolidated into nine.

In 1994, when the Calgary Regional Health Authority (CRHA) assumed responsibility for planning and delivering services, the system's components were not well coordinated or integrated (CRHA was renamed the Calgary Health Region in April 2003, and that name will be used for the remainder of this case). Despite regional governance, individual organizations were distinct and independent, each having different structures, policies, procedures and practices. There were few formal linkages between organizations, information systems were outdated and incompatible and planning and monitoring of

services were limited. A variety of system changes were undertaken to address these issues (Watson Wyatt Worldwide 1999). (Appendix A outlines CHR's journey.)

Today, CHR is one of Canada's largest integrated, publicly funded healthcare systems. Serving a population of 1.2 million people, the region is home to some of the fastest growing communities in the country. It serves the city of Calgary and numerous rural communities stretching from the Rocky Mountains to the prairies. More than 25,000 staff members and 2,200 physicians provide services in over 100 locations, including 12 hospitals, three comprehensive health centres, 40 care centres and a variety of community and continuing care sites (Calgary Health Region 2007).

CHR has achieved numerous successes. For example, it has integrated care for patients across different organizations, improved access and flow to a number of clinical services and created an effective information infrastructure closely linked to efforts to improve the quality and safety of its services.

Selected achievements

CHR has undertaken a number of clinical improvement initiatives aimed at improving the quality of the patient experience and outcomes. Examples include:

- The Foothills Interventional Cardiology Service redesigned its processes for the management of acute myocardial infarction (AMI) patients and has reduced the time from symptom onset to reperfusion via percutaneous coronary intervention in patients presenting with ST-segment elevation myocardial infarction. This project, called Strategic Evaluation and Management of ST Elevation Myocardial Infarctions (STEMI), aims to reduce morbidity and mortality by reducing the door-to-balloon time. The redesigned process refines pre-hospital diagnosis, emergency room assessment and timely transfer to reperfusion suites and includes paramedic, emergency and cardiology services. Phase 2 of the project focuses on improvements in discharge planning and education in the transition from acute care to the community. Key achievements include improving reperfusion of 90% of patients at 120 minutes, in-patient and 30-day mortality rates of 3.1% and decreasing length of stay from 7 to 5 days (de Villiers et al. 2007).
- The Prostate Cancer Rapid Access Clinic, which opened in September 2005, has significantly reduced the time to confirm a diagnosis from 15 to 5 weeks. The clinic provides coordinated and accelerated access to urologists for examination, assessment and follow-up investigations of patients determined to be at risk for prostate cancer. In 2006 the average wait time was 2.9 days from booking to clinic appointment, and the average wait time from clinic to biopsy was 4.8 days. Prior to opening

the clinic, patients could wait up to 95 days for all diagnostic testing to be completed (Prostate Cancer Institute 2006).

- Several strategies have been implemented to optimize patient flow and increase capacity within CHR. These include the implementation of the Southern Alberta Coordination and Referral Centre, a call centre providing a single point of access for rural physicians to specialists within CHR; daily bed-planning meetings with patient-care units at each adult acute care site; increasing numbers of program-based patient flow coordinators; increased utilization of program-specific urgent assessment clinics to avoid acute care admission; and repatriation of appropriate patients to rural acute care sites (Calgary Health Region 2007).
- CHR has implemented the six interventions in the Safer Healthcare Now! campaign, along with an increased focus on the reporting of close calls and adverse events through a Safety Learning Reporting System (Calgary Health Region 2007).
- CHR has reduced wait times and improved patient outcomes for assessment and treatment of hip and knee replacement. The service redesign from referral through assessment, pre-surgical optimization of health, surgery, in-patient care, rehabilitation and ongoing monitoring has decreased wait times from referral to clinic visit from 145 to 21 days, decreased time from clinic visit to surgery from 58 to 7.5 weeks and decreased hospital and overall costs by 15% and 2% respectively (Alberta Bone and Joint Health Institute 2007) (see Appendix B).

Method: Exploring a system capable of improvement

What changes and strategic investments did CHR undertake in order to transform it into a higher performing system? How has CHR developed into a healthcare system capable of improvement? To answer these questions, a team from the University of Toronto Department of Health Policy, Management and Evaluation prepared this case study. One member of the team spent three months in a practicum with CHR's leaders. She held interviews with administrative and clinical leaders, front-line staff members and members of support staff at local, organizational and regional levels. She also collected and analyzed documents pertaining to CHR's development and services. These data provided insight into CHR's investments in building improvement capability and the challenges faced in sustaining improvements.

A system capable of improvement

In 1995 CHR began restructuring in order to emphasize regional activities and accountabilities. It integrated elements from individual organizations into a network of seven operational portfolios organized primarily by geography. Dr. Chris Eagle, CHR's president and chief operating officer, was the head of the anesthesia department at Foothills Medical Centre during this time. He recalls that early in the restructuring process, each portfolio

> provided a variety of programs to meet the needs of the community it served and was led by an executive director; [but] there was limited collaboration between portfolios and few incentives and mechanisms to encourage and enable collaboration and shared responsibility for healthcare services throughout the region.

In 1996 a regional medical system was created to support physicians and clinical leaders in working collaboratively to improve healthcare delivery. Still, Alberta in the mid 1990s was a very stressful and challenging environment for healthcare. Eagle recalled that, as "a consequence of a persistent provincial culture which depicted physicians as 'cost generators' and 'only supportive of self-interests,' a deep fracture existed between physicians and the health region."

In 1999 the Canadian Council on Health Services Accreditation recommended that CHR develop a more focused approach to regional quality improvement (QI) and performance measurement (Calgary Regional Health Authority 2000a). CHR responded by consolidating improvement staff from the different organizations to form the Quality Improvement and Health Information (QIHI) portfolio in 2000. QIHI's mandate focused on building improvement capability and supporting information management across the region. QIHI integrated corporate functions for performance and data management, QI and health system analysis; it also provided a clinical and administrative decision support service to the region (see Table 1 for a list of QIHI service units). QIHI's structure provided new learning opportunities for staff members and developed consistent definitions of quality and approaches to improvement.

By 2000 the leadership structure at CHR was reorganized around clinical programs jointly led by a vice-president and executive medical director who shared responsibility for service delivery. Regional services and program planning were managed through a matrix structure while specific site issues were the responsibility of the dual leadership at each site. For example, CHR had three intensive care units (ICUs) and each resided in a different portfolio. Operational functions and issues relating to intensive care at a specific hospital were the responsibility of the site's operational and medical leaders; regional executive medical and operational directors shared responsibility for issues relating to the intensive care program across CHR. Structuring the region in this manner facilitated the implementation and spread of clinical practice guidelines and initiatives. Table 2 lists the major milestones in CHR's development between 1993 and 2008 (see also Appendix A).

Table 1. Comparison of the former Quality Safety and Health Information portfolio and new Health Outcomes portfolio

Service Units of former Quality, Safety and Health Information portfolio	Service Units of New Health Outcomes portfolio
Leadership Team • Vice President • Executive Director • Director, Quality and Safety • Director, Health Information and System Management Quality Improvement/Quality Management • Quality and Safety Education • Quality Improvement • Clinical Integration • GRIDLOCC • Patient Concerns • Accreditation Patient Safety • Clinical Safety Evaluation • Patient Safety Framework • Patient Safety Education • Human Factors • Patient/Family Safety Council Health Information and System Management • Health System Analysis • Performance Measuring and Reporting • Survey and Evaluation	Leadership Team • Vice President • Executive Director • Director, Quality and Safety, Accreditation • Director, Clinical Outcomes • Director, Population Health Observatory • Director, Information Analysis and Evaluation • Medical Directors Divisions • Quality, Safety and Accreditation • Clinical Outcomes • Population Health Observatory • Information Analysis and Evaluation • Clinical Integration

This information is based on data gathered by the case study author during interviews with CHR's directors and from observations made during site visits. As of March 3, 2008, CHR had not yet finalized or published its portfolio divisions.
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Establishing direction for CHR's delivery of health services

CHR's board and executive leadership published a vision for the future entitled *Our Community Working Together for Excellence in Health. Report to the Community* (Calgary Health Region 2004). Extensive staff and physician input contributed to the development of seven strategic directions (Calgary Regional Health Authority 1999; Watson Wyatt Worldwide 1999):

- Responsive to public expectations – people should expect to transition from one service provider to another and know how and where to access appropriate care
- Support for healthcare and service providers
- Service delivery in the community – hospital-based services will effectively coordinate with community-based services and agencies

- Leadership and innovation – create a culture of creativity and harvest intellectual capital of all staff
- Balance the needs of individuals, communities and populations
- Build relationships with all stakeholders, especially patients
- Education and research – create a culture of continuous learning and the acquisition of new knowledge

Table 2. CHR regionalization and restructuring

1993 Alberta begins restructuring its healthcare system into nine regional health authorities, each with centralized regional governance.
1994 CRHA assumes responsibility for planning and delivery of services
1995 CRHA restructures from a collection of organizations into a network of portfolios segmented primarily by geography. Each portfolio is led by an administrative executive.
1996 Regional medical system created to enable collaboration between clinical and administrative leaders to improve healthcare service delivery.
2000 Clinical and administrative executives begin sharing responsibility for service delivery within each portfolio as well as regional programs (e.g., ICU).
2000 QIHI portfolio created to enable a more focused approach to improvement, consolidate initiatives and build regional capability.
2004 QIHI becomes Quality, Safety and Health Information (QSHI) to formally embed patient safety into regional framework, structures and accountability.
2008 CHR restructures its portfolio, leadership and data warehouse structures to support results-based improvement of outcomes in core clinical areas.

Implementing these strategic directions required effective leadership to address key issues and set priorities. A dominant concern with finances at all levels of management had to be refocused on setting appropriate and evidence-based targets and priorities. Information systems capable of supplying valid and timely data to decision-makers were also needed to support a regional performance measurement system.

In 2005 CHR extended these strategic directions and established a new five-year strategic service plan to help guide providers through unprecedented levels of growth and

demand for healthcare services (Calgary Health Region 2005). The plan establishes the principles that underpin its promise to be "Leaders in Health – A Partner in Care," including the following:

- Focus on patient experience
- Emphasize wellness and community care
- Add capacity throughout the system
- Integrate all aspects of care
- Develop community-specific care
- Introduce innovation
- Embrace technology
- Build partnerships

Physician engagement

Engaging physicians in service improvements was an important ingredient in achieving these strategic directions. By 1999, recognition that only modest levels of physician engagement had been realized led to a new strategy. A Physician Partnership Steering Committee (PPSC) was formed in 2000 to identify opportunities to engage physicians in CHR planning and operations, reported Eagle. This committee solicited and prioritized physician-generated projects, managed a new physician partnership fund and advised the executive committee and CHR board on various business cases and recommendations (Calgary Regional Health Authority 2000b). The physician partnership fund – a three-year, $10 million commitment – provided "time-limited" funding to support the planning and development of physician-led pilot projects aimed at demonstrating innovative ways to improve service delivery. Proposals were accepted twice a year and $3 million was allocated each year to support between 10 and 15 projects (Calgary Regional Health Authority 2000b).

Other mechanisms were created to improve physician participation and communications. A medical task force was created to bring the voice of physicians to the regional executive leaders and board of directors. According to Eagle,

> There is plenty of "face time" between senior executives and physicians; a definite leadership presence and awareness of critical issues. … The CEO, Chief Clinical Officer and Chief Medical Officer attend all meetings of the Medical Advisory Board. The Chief Medical Officer attends all medical staff meetings with the Medical Director at each [hospital] site.

CHR has sought extensive physician input in the design, implementation and use of the Patient Care Information System (PCIS). Similarly, physician input has been a critical

component in the development of standardized order sets, medication safety and performance data, among other initiatives. Physicians receive financial subsidies and dedicated time to support their QI training and participation in improvement projects.

Building capacity for QI

In 2001 QIHI established clinical enhancement teams to provide dedicated support to clinical departments and portfolios. Each team is comprised of a part-time QI physician leader, QI consultant, data coordinator and dedicated health information analysis support. These teams support improvement projects across operational portfolios, working to improve services and integrate patient and family feedback.

Quality councils and committees were also established at all levels of the organization. The councils helped to facilitate the improvement of healthcare delivery processes, while the committees provided ongoing support and prioritization of QI initiatives. Initially, the committee structure, composition and scope of responsibility were variable and depended on the culture, resources and structures of each program or portfolio. Moreover, most proposals were accepted, which led to a large number of projects. This result left QI consultants, physicians, managers and providers struggling with their workloads and the need to find appropriate resources.

CHR invested in Institute for Healthcare Improvement (IHI) QI training for about 50 executive leaders, QI consultants and physicians. The training provided a better understanding of the philosophy, methods and tools required to expand QI into region-wide initiatives and shift from quality assurance to quality management. QIHI also developed a series of educational initiatives to provide a common frame of reference and toolkit. Education and coaching programs were developed to build competencies in QI, project management, change management and knowledge sharing for managers and front-line staff. The education curriculum includes courses (largely facilitated by QI consultants and physicians) such as Executive Leadership for Quality Improvement, Introduction to Quality and Safety, Fundamentals of Quality Management, QI Methods, Disclosure of Adverse Events, Health System Safety Analysis and Failure Mode and Effects Analysis.

Participation in improvement collaboratives

Armed with new knowledge, skills and energy, leaders and local teams participated in two major, IHI-sponsored collaborative learning projects focusing on process redesign: Waits and Delays and Surgical Patient Flow. These projects were CHR's first real opportunities to set challenging aims and to use improvement methods to do things very differently. One senior executive noted that these collaboratives "gave us the permission, ability and expectation to think differently about the way healthcare is delivered

and refocus our attention on meeting patient needs. This was incredibly challenging. It took incredible courage to redesign medical services – for executives and physicians." Relationship building was critical in engaging all stakeholders in service redesign and heightening awareness of the far-reaching impact of changes.

Building on the lessons learned from these initiatives, a larger project was developed to address the need to improve access for patients requiring hip and knee-joint replacement. The Alberta Hip and Knee Replacement Pilot Project was one of Alberta's first QI initiatives, involving 3,400 patients in three health regions (Alberta Bone and Joint Health Institute 2007). Focusing on system redesign for hip and knee-joint surgery patients in primary care, specialist care, acute care and community care, the project aimed to reshape demand and capacity to improve access to specific orthopaedic services. Results were impressive, including a decrease in wait times from 145 to 21 days for patients receiving their first orthopaedic consult, from 58 to 7.5 weeks for patients from the first orthopaedic consult to surgery and a decrease in hospital length of stay from 6.0 to 4.7 days (Calgary Regional Health Authority 1999) (see Appendix B).

Challenges that limited coordination and spread of improvement efforts

CHR's collaborative projects involved numerous teams and hundreds of people from a broad spectrum of healthcare professions. But with 25,000 staff members and 2,200 physicians in CHR, senior leaders recognized the need to find other ways to spread the required knowledge and change. QI needed to move beyond acute care. Moreover, most learning involved just-in-time, project-by-project learning. The region's initial QI efforts did not incorporate system-wide or regional projects. Instead, QI was carried out locally by departments and programs. QIHI supported QI work in clinical programs and QI consultants, and physicians led these improvement initiatives. However, because there were no formal mechanisms for sharing common ideas, QI initiatives were limited in depth and scope. Although individual improvement teams became very good at doing program-based QI projects, there were few mechanisms to link these pockets of excellence with the rest of the organization. Also, this approach also did not include a measurement system that monitored ongoing projects. Consequently, programs would often achieve a certain level of change and then revert to their old ways within a short period of time.

In addition to these issues, the growing variety of new QI tools and methodologies – rapid cycle change, IHI Breakthrough Collaboratives, statistical process control, root cause analysis, healthcare failure mode and effects analysis (HFMEA) and the region's customized Health System Safety Analysis (HSSA) tool – caused confusion in some clinical programs. These new efforts met with resistance from some managers, staff

members and physicians who were upset that QI was presented as a new idea. They believed they had always been striving to provide quality care despite resource constraints and changing expectations.

The underlying issue in these discussions revolved around local teams' roles and engagement. Looking back, senior leaders commented that they had relied on what they term a centralized "spider" model of decision-making, with decisions made by regional leaders. This approach proved to be ineffective for QI. Instead they believe they should have invested earlier in a "starfish" model of formal change management, in which front-line staff members and providers exert as much influence on project success as does central management and leadership. This model encourages local engagement and ownership, establishes an appetite for change and mitigates the risk of project death resulting from a shift in leadership priorities. Senior executives and leaders began using the starfish model to engage front-line staff and teams, leveraging the expertise of middle managers. They worked with physician leaders to ensure a shared understanding of key system drivers (i.e., access, quality and cost) and critical processes, to set clinical and process targets and to determine trade-offs necessary to achieve targets.

QIHI also established a quality management framework that incorporates performance measurement data relevant to QI (Figure 1). Developed and revised over five years, the framework links the principles of QI and patient safety to measurable improvements in processes and outcomes. The framework uses the Alberta Quality Matrix for Health (Figure 2), which maps the six dimensions of quality against areas of need (i.e., being healthy, getting better, living with disease or illness and end of life). This identification of the different quality dimensions of effectiveness, acceptability, safety and efficiency provided the scaffolding to support the region's vision, mission and values statements; to develop QI competencies; and to integrate QI into every aspect of care delivery (Quality, Safety and Health Information 2006). Ward Flemons, now responsible for this portfolio, noted that operationalizing this framework as a core business strategy across the region is still a "work in progress."

Performance monitoring and information management

In 2002 CHR adopted a Balanced Scorecard approach to monitor performance on established targets and corporate goals. Balanced scorecards were implemented at both the portfolio and individual (management and staff) levels as performance development tools. That year an information management strategic planning exercise identified three major priorities for information management:

- An Enterprise Master Person Index (with a unique patient identifier)
- A regional PCIS (e-health record)

- An information clearing house for corporate data

Together, these initiatives were needed to accelerate the analysis, monitoring and reporting of performance more broadly (Calgary Regional Health Authority 2000a).

Figure 1. Quality and safety framework

Source: Quality, Safety and Health Information (2006).
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The PCIS is a region-wide information system that relates data from diagnostic tests, assessments, treatments and other components of care for acute care patients. PCIS includes evidence-based order sets, discharge information, real-time order entry and clinical alert tools. This system has been implemented incrementally over five years and became fully functional in 2006. Data on clinical outcomes, care processes (e.g., missed appointments, wait times, compliance with standards) and other pertinent outcome,

performance and service utilization data are used to create performance indicators and highlight opportunities for improvement (Scott and Gall 2006).

Figure 2. Alberta Quality Matrix for Health

ALBERTA QUALITY MATRIX FOR HEALTH

DIMENSIONS OF QUALITY / AREAS OF NEED	ACCEPTABILITY Health services are respectful and responsive to user needs, preferences and expectations.	ACCESSIBILITY Health services are obtained in the most suitable setting in a reasonable time and distance.	APPROPRIATENESS Health services are relevant to user needs and are based on accepted or evidence-based practice.	EFFECTIVENESS Health services are provided based on scientific knowledge to achieve desired outcomes.	EFFICIENCY Resources are optimally used in achieving desired outcomes.	SAFETY Mitigate risks to avid unintended or harmful results.
BEING HEALTHY Achieving health and preventing occurrence of injuries, illness, chronic conditions and resulting disabilities.						
GETTING BETTER Care related to acute illness or injury.						
LIVING WITH ILLNESS OR DISABILITY Care and support related to chronic or recurrent illness or disability.						
END OF LIFE Care and support that aims to relieve suffering and improve quality of living with or dying from advanced illness or bereavement.						

HQCA Health Quality Council of Alberta

Adopted June 2005 by the Health Quality Network, an HQCA collaborative consisting of: Alberta Cancer Board, Alberta College of Pharmacists, Alberta Health and Wellness, Alberta Medical Association, Alberta Mental Health Board, Aspen Regional Health, Calgary Health Region, Capital Health, Chinook Health Region, College of Association of Registered Nurses of Alberta, College of Physicians & Surgeons of Alberta, David Thompson Health Region, East Central Health, Federation of Regulated Health Professions, Health Quality Council of Alberta, Northern Lights Health Region, Palliser Health Region and Peace County Health.

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Source: Health Quality Council of Alberta (2005).
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A separate system called the Community Care Information System captures client-specific information across numerous programs, services and locations throughout CHR (including hospitals). It provides an integrated view of client information, which is used by healthcare professionals and service providers to create shared care plans. Together with PCIS, these two systems aim to link data on primary, secondary, tertiary and community care services (Scott and Gall 2006).

QIHI's performance reporting unit monitors performance in improving the quality of patient care; it also designs, develops and manages reporting protocols. In 2007 the

performance reporting unit implemented an interactive electronic resource that enables staff members to access, monitor, analyze and compare key clinical outcome and quality indicators. Data can be presented in many different formats (e.g., dashboards and scorecards), which allow for regional or site-specific comparisons. Over 1,000 indicators are reported on a weekly basis; this enables managers to set specific improvement and performance targets and monitor ongoing performance (Quality, Safety and Health Information 2007).

These information systems and measures have accelerated the use of data for quality and performance improvement. For example, the Calgary Stroke Program uses performance data to monitor its ongoing performance and movement toward its goals of treating more patients in less time and improving outcomes for all stroke patients. QIHI's performance reporting unit works closely with the Calgary Stroke Program to create data sets linked to the specific goals of the program and region. Since 2004, emergency readmission rates for stroke patients in the CHR have decreased from 9% to 5% as a direct result of improvements to care delivery. Data are also used to monitor service utilization and changes in demand for services. The length of stay for stroke patients has decreased by four days since 2002, while mortality rates have decreased from 19% to 15% during the same period. This translates into annual savings of $4 million for CHR. Data also facilitate collaboration between programs and professionals, for example, to improve discharge processes (Quality, Safety and Health Information 2007).

CHR continues to seek new ways to use performance measures to assess current activities and guide improvements. Despite the growing use of data, some senior leaders have worried that there have been varying definitions of key metrics and insufficient emphasis on outcomes measurement, factors that have limited the potential impact of this information. In order to improve accountability, analysis and reporting, a decision was made in January 2008 to remove data collection and reporting from the purview of Health Outcomes (formerly QIHI). Data collection and information system development were included in an Advanced Technologies and Enterprise Reporting portfolio.

Adverse events spur patient safety efforts

In 2004 two patients undergoing continuous renal replacement therapy in one of the CHR's ICUs died after receiving a lethal potassium chloride (KCl) dialysis solution prepared by the region's central pharmacy. These deaths refocused CHR on the need to ensure safe, high-quality healthcare. Senior leaders and physicians disclosed the facts of these incidents publicly and acknowledged responsibility for the deaths. They then commissioned an external review (referred to internally as the Robson Report) that fully examined the circumstances that led to these deaths and verified the conclusions of their own internal reviews (Robson et al. 2004). CHR's board of directors also asked the

review team to look beyond these deaths to examine the strength of the patient safety culture in the various facilities providing healthcare services in the Calgary region.

The Robson Report confirmed that, in many ways, CHR was already a leader in patient safety and QI. Strong evidence of CHR's commitment to improvement appeared in the region's efforts to learn from leaders elsewhere (e.g., IHI, Intermountain Healthcare and Minnesota Children's Hospital) in order to help establish a pan-Canadian collaborative of ICU specialists to evaluate and adopt evidence-based safe practices and in its conducting of more than 25 multidisciplinary patient flow collaboratives (Robson et al. 2004). Moreover, CHR had a number of national and international experts, including Dr. Jan Davies, an anesthesiologist and patient safety expert who had developed methods and tools to understand the causes of adverse events.

Despite these efforts, external reviewers felt that there was a gap in performance across the region. Although there had been funding and support for many innovative improvement initiatives, the majority of the clinical and support staff, as well as patients, families and the public, remained relatively untouched by this work. Closing the loop and spreading knowledge and enthusiasm generated by these projects was seen as necessary to make QI and safety core organizational values and to translate the organization's vision and mission into reality (Robson et al. 2004). The latter objective was particularly challenging given that the region's vision and mission statements did not explicitly emphasize quality and safety. The accidental ICU patient deaths highlighted the need to overhaul CHR's vision, mission and values statements to reflect the importance of quality and safety. These are now central tenets and explicit components of the regional values statement (see Appendix C).

Jack Davis, CHR's chief executive officer (CEO), and the executive team established a new executive role to keep QI and patient safety front and centre at the regional level. In 2004 Dr. Ward Flemons became vice-president of QIHI; his mandate was to oversee a systematic approach to QI and patient safety. Additionally, safety was formally embedded into QIHI and its new name: the Quality, Safety and Health Information (QSHI) portfolio. Clinical safety leaders (similar to QI consultants) and safety committees were established for each portfolio; the safety structure generally mirrors that of the QI stream. QSHI's structure and position and the dual reporting of improvement consultants and clinical safety leaders facilitate learning across portfolios, programs and facilities throughout CHR. The senior operational leaders in each portfolio must approve all recommendations and tested changes before changes and innovations may be spread to other portfolios. QSHI then publishes approved recommendations, which are also regularly evaluated to determine their impact and sustainability.

According to Ward Flemons, the development of key safety policies and procedures has enriched QI work throughout CHR. Core safety policies (Calgary Health Region nd b) include the following:

- A just and trusting culture of safety
- Disclosure of harm to patients
- Reporting of harm, close calls and hazards
- Informing partners and stakeholders about safety hazards, failures and fixes

Rather than assigning blame, a just and trusting culture supports disclosure and transparency. This creates an environment that encourages (and expects) reporting of system vulnerabilities and defects. Greater transparency and sharing of lessons learned across programs helps to address system vulnerabilities and reduce recurrences. In 2007 the safety learning reporting system was developed and implemented as a pilot project. This system allows healthcare providers to easily report hazards, close calls and adverse events, and it helps them to monitor progress on recommended system improvements. Glenn McRae, the director of quality and safety at QSHI, noted that "the most critical piece of the safety learning reporting system is its ability to accelerate a culture of safety and QI by enabling knowledge into action."

CHR's senior executive team works to entrench the organization's vision, mission and values through visible commitment to safety policies at the provider and patient levels, regular use of "fireside chats" with staff members and patients, and Safety WalkRounds™. During the latter, senior operational and medical executives meet with front-line staff members from each unit to discuss new and ongoing safety concerns. Staff members are asked to highlight problem areas relating to system vulnerabilities and propose potential solutions wherever possible.

New directions

In late 2007 CHR reviewed its organizational and leadership structures. Many in the system believed that the portfolio organization and dual administrative and physician leadership model had helped to link physicians into regional strategies and accelerate improvement. Eagle reported, however, that there were concerns that the structure had created overlapping and redundant accountabilities and inhibited change. For example, according to Eagle, despite the emphasis placed on safety practices and policies, much of this work seemed "pasted to the outside of portfolios" rather than residing within. The structures seemed to slow fundamental changes at the front line and needed to be more adaptive in order to meet the evolving needs and requirements of the system and patients. Additionally, the region needed to use data more effectively to track and improve population-based health outcomes.

In January 2008 CHR reorganized its portfolio and leadership structures and refocused its use of data to support improvement in a variety of outcomes. The new portfolios were structured according to the population(s) served and/or services provided, and were aligned around the core clinical businesses. These new portfolios are:

- Health Outcomes (formerly QSHI)
- Public Health
- Wellness and Citizen Engagement
- Continuing Care, Medical Services and Seniors Health
- Community Health Services
- Interventional Services (diagnostic imaging; surgery; cardiac sciences; neuroscience; trauma; human organ procurement and exchange, and tissue; bone and joint)
- Critical Care, Emergency, Laboratory and Clinical Support Services
- Child and Women's Health and Specialized Clinical Services

An executive vice-president was appointed to lead each portfolio; these individuals were responsible for operations across the continuum of care. Most of the previous physician leaders (executive medical directors) were reassigned as associate chiefs of medicine in each portfolio, with a direct reporting relationship to the chief of staff. The goals of the restructuring emphasize increased accountability, enhanced performance and flexibility for core clinical programs. As Eagle noted, CHR is entering an uncertain environment in which the organization must move fast; the region needs the agility and flexibility to drive change more quickly: "we [CHR] believe that this new structure brings this [flexibility]."

Much like Intermountain Healthcare's strategy, CHR's leaders seek to prioritize improvements for the high-cost, high-volume and high-risk clinical programs, creating more robust metrics to help drive substantive improvements. Eagle observed that quality, safety and health information now reside within the Health Outcomes portfolio and are distinct entities that have been recast to support defined clinical priorities, outcomes and metrics.

Strategic value of QI and safety

As CHR has progressed in its approach to QI, it has increased the number and type of staff members who have QI knowledge and skill, built an infrastructure to develop useful data and methods to guide performance and emphasized a culture of quality and safety. New projects are now addressing broader corporate goals: improving the patient experience and creating healthy communities.

Project GRIDLOCC (Getting Rid of Inappropriate Delays that Limit Our Capacity to Care) and Clinical Integration are projects that target areas of strategic priority. Project GRIDLOCC involves a number of QI initiatives designed to decrease wait times, minimize system bottlenecks and alleviate emergency department congestion. Flemons described GRIDLOCC as "a strategic QI initiative which focuses on 'end to end' patient care – from first contact with a family physician or emergency department, through to hospital care and transition to an appropriate level of care in the community." He added that "wait times in emergency departments are a symptom of patient flow problems throughout the system. We must redesign our work and ensure that discrete processes link appropriately to meet patient needs across the continuum of care."

Clinical Integration involves a disciplined approach for improving patient care beyond acute care. It relies on a structured methodology to implement evidence-based practice for cross-functional teams. "Cross-functional teams represent the entire patient journey. These teams are better able to design or redesign services such that patient care needs are met at all points in their care," said Dr. Joe Dort, the medical director of Clinical Integration. Data extracted from PCIS, e-health record, patient feedback and population health databases are used to inform process design and redesign. Clinical integration pilot projects in spine health and retinal surgery began in 2007. These projects will be expanded to focus on high-risk, high-cost (financial and social) or high-volume clinical priorities.

Barriers and facilitators to improving quality and safety

Barriers

Like other Alberta health regions, CHR has benefited from the province's strong economic growth. Funding for healthcare services is generally higher than in other parts of Canada. However, the resources boom has created difficulties in recruiting and retaining staff. Generating an environment that supports QI is difficult when staff members and physicians are overworked. There continues to be tension between some direct care providers and QI staff. Some front-line clinicians feel that available resources should be deployed to patient care rather than QI. They believe front-line staff members have always worked diligently to provide the highest quality of care possible – and would do more if given more resources. Moreover, the range of different initiatives has created, in the words of one staff member, "too many burning platforms," a situation that leads to confusion, fatigue and reduced capacity to change for some individuals.

Physician engagement has proven difficult in the absence of financial incentives. QI projects require dedicated time, something that affects physicians' incomes. It has been

difficult to engage residents in QI initiatives because they have limited exposure to quality, performance and patient safety in their academic training and are not given protected time to participate in local QI initiatives.

The QSHI portfolio team made considerable progress in creating data sets that evaluate performance across a variety of dimensions to guide improvement. However, decision-makers require data that will enable them to evaluate team or system-wide performance for specific patient populations or processes. For example, measures that focus on specific processes in the cardiac program may be evaluated by time of arrival in emergency to admission, patient length of stay, rehabilitation time, number of readmissions and time for patients to return to work.

CHR (like other Alberta regional health authorities) is publicly funded by the Alberta Ministry of Health and Wellness, which allocates funds and sets healthcare policies (Alberta Ministry of Health and Wellness nd). Regional health authorities are mandated to collect a variety of administrative measures; however, these metrics often do not align with or support system-wide QI. Provincial health priorities and foci depend on the priorities of the current minister of health. Ongoing initiatives and resources may be interrupted or redirected with changes in the minister's office.

Facilitators

The commitment of CHR's CEO and senior executive team to service excellence and the provision of high-quality patient care is broadly recognized by managers, physicians and other staff members. In addition, development of the QSHI portfolio has provided resources, training and expertise that have accelerated QI and patient safety throughout programs, organizations and the region. The development and use of data for planning, improving and monitoring healthcare services at all levels has been important in identifying QI targets and guiding local efforts.

CHR has been effective in developing a cohort of influential physicians with QI knowledge and training. These people bring visibility and expertise, and they communicate the relevance of QI work to CHR's entire physician workforce.

Next steps

"The CHR is at the end of the beginning of the development stage," noted QSHI's Glenn McRae. He (and others) described the region as "moving into the implementation stage, the hallmark of which is a regional approach that operationalizes improvement, links pockets of excellence and integrates all components of the patient journey." The following are some of the key strategies CHR has implemented:

- An e-health record
- PCIS
- GRIDLOCC (the safety reporting learning tool)
- Clinical Integration
- Alberta Matrix for Health
- An integrated learning strategy

The last strategy aims to increase awareness of the science and principles that underpin regional safety policies and to assist leaders, middle managers, front-line staff and physicians to work collaboratively to build a culture of safety.

CHR has invested considerable financial and human resources in the development of QI knowledge and skills across the organization. Despite this, many front-line staff members have yet to participate in improvement work. Moreover, human resources are scarce and all three acute care hospitals run near 100% capacity; consequently, staff members are often unable to dedicate time to improvement projects. CHR's senior leaders hope that many more direct care providers will participate in projects to improve patient flow in order to help increase capacity and free up time for education and professional development. Creating a critical mass of individuals with improvement knowledge, skills and experience will accelerate improvement work across the region. Restructuring the QI consultant and physician roles so those staff members work more closely with portfolio directors and assist in identifying strategic priorities may also increase the impact of improvement efforts and enable innovations and tested changes to spread more rapidly to operational leaders. According to Flemons "the goal is to further operationalize quality and safety rather than having QSHI staff and consultants lead and develop initiatives."

CHR has developed a strong track record of improvement; however, many of its efforts have focused on pilot projects (albeit with good results). Moving from demonstration and pilot projects to realizing substantial changes in key areas is the next challenge. Eagle summarized the region's strategy determining priority areas, focusing on these areas and achieving desired outcomes: "Good ideas and demonstration projects only get you so far. Without change in philosophy and behaviour, very little [change] can really happen."

Conclusion

Over the last 14 years CHR has evolved from a collection of independent organizations with different structures, policies, procedures and practices into one of Canada's largest integrated healthcare systems. CHR's board of directors and senior leaders have led a

shift from an external focus on revenues, resources and finances to an internal transformation that focuses on improving care and creating innovative approaches to care delivery. New regional patient safety policies support a just culture and provide a clear set of principles that underpin improvement.

Physician leadership, engagement and adherence to evidence-directed practice have advanced improvement in all programs. A key strategic decision to establish the QSHI portfolio to develop improvement capability, performance measurement, health system analysis and evaluation, QI and patient safety has also been integral to CHR's progress. The development of integrated, region-wide information systems provides timely data for decision-makers at all levels of the organization, and the ability to link key clinical process, outcome and finance measures enables managers to monitor a balanced set of measures for accountability and clinical process improvement.

Many QI projects have been launched over the past eight years, and they are now resulting in measurable improvements. But they also present pragmatic challenges. For instance, how can the region continue to support staff members and physicians in ongoing QI work while it is under pressure to deal with high service demands? How can CHR better utilize and develop its leaders to advance improvement and spread change? Will recent changes enable CHR to improve patient outcomes in core clinical areas and move the region closer to its goal of becoming fully integrated and capable of system-wide improvement?

References

Alberta Bone and Joint Health Institute. 2007. *Alberta Hip and Knee Replacement Pilot Project. Scientific Evaluation Report.* Retrieved June 23, 2007. <http://www.albertaboneandjoint.com/projects/arthroplasty/Hip%20Knee%20Scientific%20Report.pdf>

Alberta Ministry of Health and Wellness. nd. *About Us.* Edmonton: Government of Alberta. Retrieved May 27, 2007. <http://www.health.gov.ab.ca/about/minister.html>

Calgary Health Region. 2004. *Report to the Community 2004.* Calgary: Author. Retrieved April 26, 2007. <http://www.calgaryhealthregion.ca/communications/pdf/2004_report_to_the_community.pdf>

Calgary Health Region. 2005. *Strategic Service Plan – Overview. Changing the Face of Health Care: Our Five Year Plan.* Calgary: Author. Retrieved October 21, 2007. <http://www.calgaryhealthregion.ca/corporate/about_us/pdf/healthplan.pdf>

Calgary Health Region. 2007. *Annual Report 2005-2006.* Calgary: Author. Retrieved April 20, 2007. <http://www.calgaryhealthregion.ca/communications/pdf/2005-2006_annual_report.pdf>

Calgary Health Region. nd a. *Vision, Mission and Values.* Calgary: Author. Retrieved March 29, 2007. <http://www.calgaryhealthregion.ca/communications/about_us/mission.html>

Calgary Health Region. nd b. *Patient Safety Policies.* Calgary: Author. Retrieved February 29, 2008. <http://www.calgaryhealthregion.ca/qshi/patientsafety/policies.htm>

Calgary Regional Health Authority. 1999. *Annual Report 1997-1998. Working Together for Health.* Calgary: Author.

Calgary Regional Health Authority. 2000a. *CCHSA Accreditation Update Report.* Calgary: Author.

Calgary Regional Health Authority. 2000b. *Physician Partnership Steering Committee Report.* Calgary: Author.

de Villier, J.S., T. Anderson, J.D. McMeekin, R.C.M. Leung and M. Traboulsi. 2007. "Expedited Transfer for Primary Percutaneous Coronary Intervention: A Program Evaluation." *Canadian Medical Association Journal* 176(13): 1833-38.

Health Quality Council of Alberta. 2005. *Alberta Quality Matrix for Health.* Retrieved February 23, 2008. <http://hqca.ca/templates/HQCA5/pdf/Final_Matrix_2005-06-23.pdf>

Prostate Cancer Institute. 2006. *Annual Report.* Retrieved November 2, 2007. Calgary: Prostate Cancer Institute. <http://www.prostatecalgary.com/client/whats_new/85/86/2006_annual_report.pdf>

Quality, Safety and Health Information. 2006. *2006 QSHI Annual Report.* Calgary: Calgary Health Region. Retrieved May 14, 2007. <http://www.calgaryhealthregion.ca/qshi/qshi_annual_report_12oct06.pdf>

Quality, Safety and Health Information. 2007. *2007 QSHI Annual Report.* Calgary: Calgary Health Region. Retrieved October, 2007. <http://www.calgaryhealthregion.ca/qshi/qshi_annual_report2007.pdf>

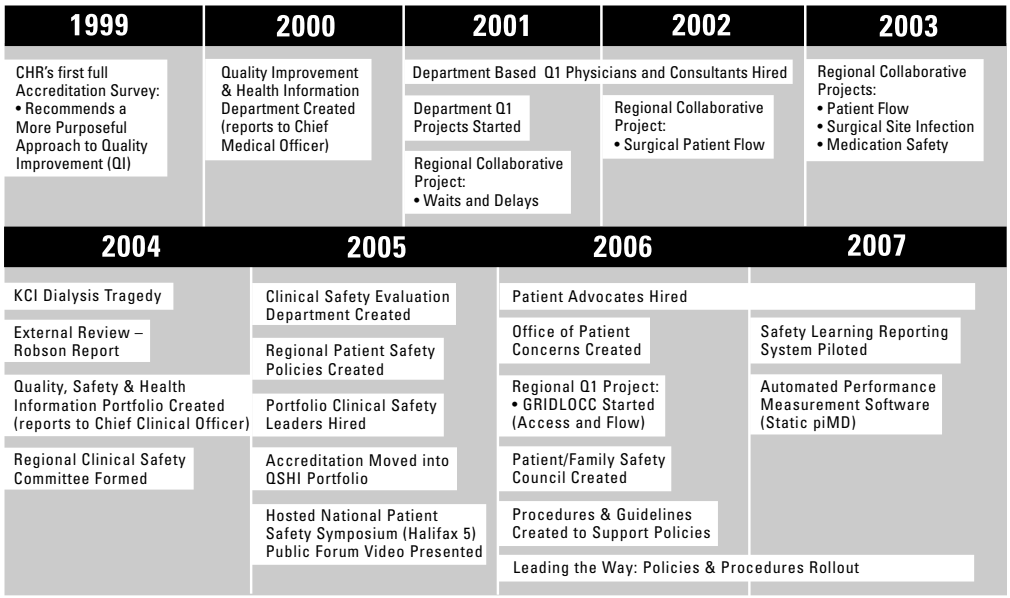
Quality, Safety and Health Information. nd. *About Us.* Calgary: Calgary Health Region. Retrieved February 23, 2008. <http://www.calgaryhealthregion.ca/qshi/about_us.htm>

Robson, R., B. Salsman and J. McMenemy. 2004. *External Patient Safety Review.* Unpublished.

Scott, C. and N. Gall. 2006. *Knowledge Use in the Calgary Health Region: A Scan of Initiatives that Support Use of Evidence in Practice.* Calgary: Calgary Health Research. Retrieved June 18, 2007. <http://www.calgaryhealthregion.ca/research/images/Knowledge_Utilization_Scan_Full_Report_%20Aug_28_2006.pdf>

Watson Wyatt Worldwide. 1999. *Calgary Regional Health Authority: Organizational Review.* Calgary: Calgary Health Region.

Appendix A. CHR's transformation from 1999 to 2007



Source: Adapted from Quality, Safety and Health Information (nd). Used by permission.

Appendix B. Alberta Hip and Knee Replacement Pilot Project – Six Dimensions of the Alberta Matrix for Health

Dimensions of Quality	Current Approach	New Continuum of Care
Accessibility	Referral to seen – 145 days Seen to surgery – 58 weeks	Referral to seen – 21 days Seen to surgery – 7.5 weeks
Efficiency	Surgery time – 119 minutes Acute LOS – 6 days Cost change – toward new	Surgery time – 109 minutes Acute LOS – 4.7 days Cost change ↓ 15% hospital ↓ 2% overall
Acceptability	Long waits = decreased quality of life and increased cost	Reduced wait = minimal decrease in quality of life and cost More personal and more intense
Effectiveness	Improved physical and social function and reduced pain	Even greater increase in physical and social function and pain reduction
Safety	4.8 joint-related adverse events per 100 patients <30 days after surgery 2.2 joint-related adverse events per 100 patients ≥30 days after surgery	4.1 joint-related adverse events per 100 patients < 30 days after surgery 1.2 joint-related adverse events per 100 patients ≥30 days after surgery
Appropriateness	31% mobilized day of 75% spinals Discharge change – toward new	85% mobilized day of 82% spinals Reduced use of surgical wound drains

No difference in patient age, sex, BMI, health status, socio-economic factors.
Source: Alberta Bone and Joint Health Institute (2007). Used by permission.

Appendix C. CHR vision, mission and values

VISION, MISSION AND VALUES

vision: healthy communities
mission: leaders in health - a partner in care
values:

WE VALUE	AS SHOWN BY
caring respectful relationships	Providing patient and family centred care Showing respect, equality and fairness Being compassionate Maintaining dignity Valuing contribution
quality and safety	Committing to safety Providing accessible services Working in partnerships Providing best practice, evidence-based care
accountability	Being honest Building trust and being trustworthy Displaying integrity and the highest level of ethical behaviour Being accountable for our decisions and actions

Source: Calgary Health Region (nd). Used by permission.