

Improving Patient Safety Performance in Acute Care: Reducing Falls, Pressure Ulcers and Unrelieved Pain

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Glossary of Acronyms

MUHC	McGill University Health Centre
RNAO	Registered Nurses Association of Ontario
BPGs	Best Practice Guidelines
PARIHS	Promoting Application of Research in Health Services framework
CHSRF	Canadian Health Services Research Foundation
GRISIM	Groupe de recherche interuniversitaire en sciences infirmières de Montréal
RUIS	Réseau universitaire intégré de santé
TF	Task Forces (for implementation of best practice guidelines)

Abstract

Background: In 2004, a Best Practices Program was launched by the Nursing department of the McGill University Health Centre with the intent of improving the quality of care by reducing pressure ulcers, falls and fall injuries and unrelieved pain in acute care. The introduction of best practice guidelines (BPGs) across 5 hospitals focused on increasing reliability by decreasing variability in care processes and ensuring patients received evidence-informed care.

Methods: From 2004-08, three best practice guidelines (assessment of pain, assessment of pressure ulcers, and prevention of falls) developed by the Registered Nurses Association of Ontario were systematically implemented on 39 in-patient units. 73 unit-based implementations occurred (some units focused on all three BPGs). The PARIHS framework which guided this work focuses on the role of evidence, context and facilitation in uptake of evidence-informed practice. Infrastructure supports included: BPG steering committee, task forces for each BPG, training of over 200 champions at unit and organization-wide levels, and researchers on each task force. Extensive educational training on patient safety, prevention and change management occurred. BPGs were first piloted on 11 units, then “roll-out” occurred in three cycles per year. Annual prevalence surveys provided comparative data for pressure ulcers and levels of moderate to severe pain, whereas fall and fall injuries incidence rates were obtained via required incident reporting. Two research studies focused on measurement of patient and practitioner outcomes, sustainability and the influence of facilitation, context and evidence in changing practice.

Results: Significant reductions occurred in rate of pressure ulcers, falls and fall injuries. More recently, the rates of unrelieved pain have begun to decrease somewhat. Significant improvements occurred in practice changes as measured vis-à-vis documentation in the clinical chart; and these have been sustained for the most part. Documentation and lack of informatics systems were seen as serious obstacles. Combination of dedicated project leaders, advocates who can work across large systems, local champions, and researchers working together in teams was critical to the success. Use of incentives, support for ongoing learning and recognition for leadership were important. Managerial style at the unit level had important effects, as local power holders strongly influenced the rate of adoption. Awarded provincial 3M Clinical Innovation Grand Prize. Development of falls business case led to investments in preventive equipment.

Implications: Patient safety is both a moral imperative and a financial one. Introduction of best practices needs to be accompanied by good information systems and decision-support tools, so that work processes are streamlined and do not increase workload burden on practitioners. A long-term commitment to reducing adverse events involves changing provider and client behavior, as well as organizational changes including coalition-building and follow-up activities to promote new practices.

Key Messages

Patient safety is both a moral imperative and a financial one. Developing a culture of safety means safety must truly be a top priority of an organization. There was a gap between the values for safety at strategic / corporate level and operationalization to the frontline. This was evident given the serious lack of resources for basic safety and fall prevention care, serving as a barrier to practice change. Senior executives need to monitor and close this gap. Introduction of best practices needs to be accompanied by good information systems and decision-support tools, so that work processes are streamlined and do not increase workload burden on practitioners. Reducing healthcare costs from injurious falls, pressure ulcers and unrelieved pain involved shifting resources to preventive strategies. Some of this resource allocation was cost neutral, entailing better use of existing resources, while new funding was required for equipment to prevent costly events such as hip fractures.

The combination of dedicated project leaders, advocates who can work across large systems, local champions, and researchers working together in teams was critical to the success of implementation of evidence into practice. The multiple roles played by designated facilitators is particularly significant given the tremendous pressure of competing priorities and demands that pull not only practitioners but mid-level managers and executives in many different directions. It was clear that investments to support these improvement infrastructures (teams of champions, project manager, task forces) are needed. Relatively low cost, they serve as important incentives.

A long-term commitment to reducing adverse events involves changing provider and client behavior, as well as organizational changes including coalition-building and follow-up activities to promote new practices. These changes are not easy to make. Best practice guidelines were viewed as relatively easy to learn and the multiple bundled interventions seen as having positive effects on patient outcomes. The use of incentives, support for ongoing learning and recognition for leadership were important investments. Staff awareness of and education about the types of safety devices is another mediating factor to effective use of safety equipment. Equally important is the alignment of all departments/ disciplines, committed to working together on an effective safety agenda, with frontline staff involvement in shaping change.

Evidence is socially and historically constructed, and its implementation is affected by an interaction with contextual and other variables. Facilitators have the potential to work with managers and teams to articulate these issues, and utilize strategies that acknowledge and incorporate these factors. Managerial style at the unit level has important effects, as local power holders strongly influence the rate of adoption; they need to be targeted for continuous learning and support. A research agenda for prevention of adverse events should be supported, while ensuring commitments to knowledge transfer. Raising the safety bar will involve improving access (less wasted patient days due to adverse events), and matching of need to services, and identifying additional needed resources.

Executive Summary

Over the last two decades, there have been substantial changes in the organization and delivery of healthcare. These fast-paced changes have resulted from significant, concurrent modifications to healthcare funding formulas and cost-containment efforts, growth in and demand for healthcare technologies, changes in the healthcare workforce and new expectations of the public for greater accountability from healthcare providers and governments. For the last several years, there has been a growing concern amongst healthcare providers and administrators about the impact of such rapid changes on patient safety.

International studies on patient safety have brought to light a body of evidence on the extent of adverse events in health care, now pushing the issue to the forefront of public debate. Fall injuries are the leading type of adverse events reported in acute and long-term hospital settings, affect both younger and older patients, and account for 20 % of all injury-related deaths among seniors in Canada, with an estimated annual direct cost of \$ 2.4 billion. Pressure ulcers represent another significant preventable adverse event in hospitals and are most often seen in elderly, debilitated and immobile clients, those with severe acute illness (e.g. those in intensive care units) and in individuals with neurological deficits. The median cost of treatment for pressure ulcers in long-term care facilities within Canada is \$24,050 (Canadian Association of Wound Care, 2004). The societal cost of unrelieved pain is a significant burden to individuals, their families and the health care system, as it has profound physiological and psychological effects on patients--- yet it is only beginning to be monitored for its impacts and prevalence in acute care. Each of these clinical issues contributes to increased morbidity (illness), longer lengths of stay (access), and significant avoidable expenses (costs). At the start of this work, approximately 1,100 falls were reported annually at the MUHC, 33 % causing harm and 1.4 % causing permanent injury. There were no system-wide data on pressure ulcers or unrelieved (moderate to severe) pain.

Goals

Goal 1.Reduce falls, fall injuries, and pressure ulcers by at least 20 % by 2007 and reduce the percentage of patients reporting moderate to severe pain levels, through the implementation of evidenced-based best practice guidelines in acute care.

Specific objectives were to: a) implement three best practice guidelines aimed at reducing adverse events and better pain control across 5 hospitals to improve patient, practitioner and organizational outcomes. Identify and address work re-organization issues associated with strategic changes at multiple levels of the organization; b) evaluate the impact of implementation of best practice guidelines (BPGs) at the patient and practitioner levels; c) Improve corporate clinical-administrative reporting/ monitoring systems related to adverse event reporting to allow benchmarking and better performance management.

Goal 2. Develop a stronger culture of safety and evidence-informed decision-making by increasing “organizational readiness” regarding the impact of adverse events, and linking the organization’s performance directly to safety outcomes.

Specific objectives were to: a) evaluate impact of implementation of best practice guidelines (BPGs) at the *organizational* level; b) develop a business case for falls safety by evaluating the corporate resources needed to improve safety practices and the potential cost avoidance by taking preventive action; c) obtain funding for the BPG implementation program to support sustainability/spread; d) strengthen safety culture of the organization.

Two conceptual frameworks guided this work: a) the Promoting Action on Research Implementation in Health Services (PARIHS) framework; and b) one developed by the Committee for the Work Environment for Nurses and Patients (commissioned by the U.S. Institute of Medicine) that matches sources of threats to patient safety in the work environment with corresponding safety defenses.

Key findings:

We have seen considerable reductions in the rate of pressure ulcers, falls and fall injuries, performing better than benchmark levels. More recently, the rates of unrelieved pain have begun to decrease somewhat. Additionally, for the *research studies* conducted on 31 units, statistically and clinically significant improvements occurred in practice changes as measured vis-à-vis documentation in the clinical chart; practice changes have been sustained for the most part. Further progress will require work on the documentation and informatics systems, as bedside practitioners saw these as serious obstacles. Ongoing human resource shortages will require redesign of roles and responsibilities within the interdisciplinary team to ensure that there are adequate and appropriate skill levels present to ensure patient safety.

Effective performance management is premised on ensuring accurate and timely performance information is available to a wide group of stakeholders. To allow benchmarking comparisons (internal and external), new methods of reporting fall and fall injury rates were ultimately adopted, and performance on these new clinical indicators is now regularly reported throughout the organization, including to the Board of Directors. Reducing healthcare costs from injurious falls, pressure ulcers and unrelieved pain involved shifting resources to preventive strategies. Environmental and equipment evaluations of clinical areas revealed significant problems with lack of basic equipment and fall risk reduction safety devices available within the organization. Many, but not all, of these problems have now been adequately addressed via business case development.

Because of the magnitude of this initiative, considerable infrastructure was essential to ensure the adoption and sustainability of safety improvements e.g. steering committee, task forces co-led by clinical leaders, training change agents who could work across the organization, as well as local champions, to facilitate the adoption of evidence-based practice guidelines. A key feature was the mix of disciplines—nursing from all levels of frontline to executives, as well as physicians, pharmacists, physiotherapists, researchers, Quality department and technical services. The combination of dedicated project leaders,

advocates who can work across large systems and local champions working together in teams was critical to the success of implementation of evidence into practice. The multiple roles played by designated facilitators is particularly significant given the tremendous pressure of competing priorities and demands that pull not only practitioners but mid-level managers and executives in many different directions. Leadership development and team building were continuous. At nearly every step of the implementation pathway, there were new hurdles, some anticipated, many not; attention to contextual factors was critical.

Our implementation strategies and timeline were adjusted based on regularly sought feedback from the frontlines, middle management and executive feedback. Piloting new interventions allowed for critical feedback from practitioners to revise and improve both the planned practice changes (especially documentation) and the educational and support processes used. Mid-phase adjustments were made based on feedback, which ensured more effective uptake during the broader rollout across the whole organization. In general, the results from the surveys, focus groups, informal chart audits and environmental evaluations were positive; as well, they shed light on areas where facilitation and educational strategies could be further improved.

Staff felt BPGs are relatively easy to learn and have added value, as long as they do not increase workload (particularly documentation); they also felt their own care practices improved. There were lessons learned, however, about the negative impact of inadequate resources for basic important fall prevention equipment, devices and environmental risks. The implementation experiences across 5 sites and over dozens of units were dissimilar in some significant ways, reminding us of the distinct differences in unit cultures, leadership styles and ways in which people work together. Sustainability of changes is the ultimate challenge. A major force to deal with is the constant barrage of competing demands, which effectively reduces the amount of readiness and energy available to get work done. In an organization of this size and complexity, it is a continual struggle for teams to have sustained efforts over time. It was clear through the discussions that while the leaders shared the same vision and priorities related to best practices and harmonization of work processes, there were multiple breaks in the system of support to/ communication with middle managers.

An important outcome was increased collaboration across disciplines and across the 5 sites, following early periods of testing, uncertainty, and some territorial behavior. Practitioners and managers transcended their usual boundaries (and site cultures) to develop strong, productive collaborations. They have maintained their commitments despite competing priorities. Why has this occurred? Many reasons explain it, but importantly, the fact that there were clear and shared goals and these were aligned with organizational priorities of a number of disciplines brought people together. Keeping them together was most likely due to the decision-making power and authority these teams were given to figure things out/ test/ experiment on their own, executive level buy-in and multiple levels of encouragement, funding support and recognition.

Introduction

Background

Over the last two decades, such substantial changes have been made in the organization and delivery of healthcare in first world nations that many of the traditional symbols of health care (single, self-governed hospitals), simply no longer exist. These fast-paced changes have resulted from significant, concurrent modifications to healthcare funding formulas and cost-containment efforts, growth in and demand for healthcare technologies, changes in the healthcare workforce and new expectations of the public for greater accountability from healthcare providers and governments. The evidence base guiding many of these broad impact changes was limited and fiscally driven in large part. Throughout this same period there has been a growing concern amongst healthcare providers and administrators about the impact of these changes on patient safety, particularly relating to care delivered in hospital environments.

As pointed out by Jeffs et al, (Jeffs, Law, Baker, & Norton, 2005) the evolution of patient safety as a health policy issue is relatively new, and it most clearly took root via the landmark report “To Err is Human” from the Institute of Medicine (IOM, 2000) in the United States. International studies on patient safety have brought to light a body of evidence on the extent of adverse events (AE) in health care, now pushing the issue to the forefront of public debate. Ross Baker and Peter Norton, co-primary investigators of the Canadian Adverse Events Study (CAES), define adverse events as unintended injuries or complications resulting in death, disability or prolonged hospital stay that arise from healthcare management (Baker et al., 2004). The direct costs of preventable AE in the

U.S. were estimated to be \$10.1M (Leape, 1994) and malpractice litigation is another source of direct AE costs (\$131 K/ settlement) in Canada. Reducing adverse events is a complex system-wide challenge requiring a broad range of actions. Ensuring patient safety requires operational systems and processes that will maximize the likelihood of preventing adverse medical events. Very rarely do these adverse events occur due to negligence, but almost always result from a complex series of behaviors and failures in systems or processes of care. It is estimated approximately 37 % of the adverse events occurring in Canadian hospitals are preventable (Baker et al., 2004).

The McGill University Health Centre (MUHC) is one example of the complex structural changes in health service delivery within Canada, whereby a large health system was voluntarily created from the merger of 5 previously independent acute care teaching hospitals of McGill University in 1997. While each hospital partner in this merger had its own quality and safety programs prior to the merger, the cultural differences across these sites were significant – negatively impacting the development of a new common vision for the merged organization.

As the Nursing department gradually focused on new common goals, a decision was made by the Executive Committee to commit to three quality and safety indicators seen as “sensitive” to nursing practice patterns. The indicators chosen following comprehensive reviews of the literature were: falls and fall injury prevention, pressure ulcer prevention and unrelieved pain. While there are many other safety issues such as medication errors that could have been selected, a critical decision was to resist the usual temptation to select too many clinical targets at the beginning– a practice that often leads to lack of success or sustainability. Required organizational practices such as medication

reconciliation, now part of the Canadian Accreditation process, were standards yet to be formulated when the MUHC Nursing department was making its decisions about core safety practices to target in 2002.

Selection of these particular indicators was influenced by the degree of nurse involvement in the care processes, recommendations from national bodies such as the American Nurses Association (ANA, 2002), accreditation standards and perceived feasibility by the Nursing Executive group. While the genesis for this work emanated from nursing, it was understood that approaches to improving safety performance with these clinical targets would necessarily need to be interdisciplinary in nature, as many disciplines contribute to the clinical decision-making and care delivery in our environments. The selection of these indicators was later followed by the initiation of a “best practices” program whose aims more broadly focused on developing a stronger culture of safety and evidence-informed decision making within the MUHC.

The performance improvement target levels for each of the 3 indicators were the jurisdiction of the task forces, and they selected targets that would be achievable within a two-year time frame. The falls and skin integrity task forces chose 20 % improvement targets, whereas the pain task force selected a more ambitious target of 50 % reduction in patients experiencing moderate to severe levels of pain. Selection of the targets for practitioner level changes was set at a minimum of 10% based on the important work of Grimshaw et al. (2004). The approach of using a multi-level strategic change “program” was premised on the existing evidence relating to key factors for successful adoption and sustainability of change. This paper will report on the goals, implementation processes and the results achieved vis-à-vis patient, practitioner, and organizational outcomes.

Falls with injury are the leading type of adverse events reported in acute and long-term hospital settings, and affect both younger and older patients. Falls constitute the 6th leading cause of death in Canada and the leading cause of injury admissions in Ontario (Canadian Institute for Health Information, 2002). They account for 20 % of all injury-related deaths among seniors in Canada, and the estimated annual direct cost is \$ 2.4 billion. Studies have shown that 2-15% of all hospital in-patients experience at least one fall, with 29-48% resulting in injury and 4-7.5 % in serious injuries (Halfon, Egli, Van Melle, & Vagnaire, 2001; Morse, 2002). Many of these fall events are judged to be highly preventable and can lead to significant morbidity and mortality. Despite compelling data on the incidence and potential consequences of falls in the acute care setting, research in this area is more limited than in community and long-term care settings.

Pressure ulcers represent another significant preventable adverse event in hospitals. Pressure ulcers, also known as pressure sores, bedsores and decubitus ulcers, are areas of localized damage to the skin and underlying tissue. This damage is generally a result of external forces – pressure, shear and/or friction. Pressure ulcer development occurs in institutional and community settings, and is most often seen in elderly, debilitated and immobile clients, those with severe acute illness (e.g. those in intensive care units) and in individuals with neurological deficits (NHS Centre for Reviews and Dissemination, 1995). The median cost of treatment for pressure ulcers in long-term care facilities within Canada are \$24,050 for three months of treatment as reported by the Canadian Association of Wound Care (2004) from a study conducted in the late 1990s. U.S. estimates are \$500 to \$50,000 per ulcer, with more severe wounds being significantly more expensive to manage than less severe ulcers (Pompeo, 2001). These costs,

however, do not address the burden of pain and suffering and the impact on the individual's quality of life.

Pressure ulcers require increases of nursing time by up to 50 %, thus negatively impacting already scarce human resources. The high prevalence of pressure ulcers is a significant health care concern, and many healthcare accreditation bodies require organizations to have comprehensive prevention programs in place. A recent study reported by Woodbury & Houghton (2004) reviewed data that surveyed over 14,000 patients from 45 health care institutions across Canada, and estimated the prevalence of pressure ulcers in all healthcare settings across Canada was 26.2%. The rates by types of organizations are as follows:

- Acute Care Hospitals: 25.1%
- Non-Acute Facilities (Long-term care, nursing homes): 29.9%
- Mixed Health Care Facilities (acute and non-acute): 22.1%
- Community Care: 15.1%

A third area of organizational safety performance is pain management. While the assessment and management of pain is not a new clinical imperative, the reporting of pain management at corporate levels, other than through patient satisfaction surveys, is quite recent and still relatively uncommon in North America. A study by the World Health Organization conducted in five continents demonstrated that approximately 22 per cent of the population has suffered from persistent pain over the past year (Gureje, Von Korff, Simon, & Gater, 1998). The societal cost of unrelieved pain is a significant burden to individuals, their families and the health care system, as it has profound physiological and psychological effects on patients, which can affect their recovery from acute illness, alter their physical and emotional functioning, decrease quality of life, and impair their

ability to work (deWit et al., 2001; Jovey, 2002; Lin, 2000;). Yet, in spite of these dire consequences, numerous studies continue to report significant incidences of unrelieved pain across all patient populations. Given the evidence of the enormous impacts of unrelieved pain on suffering, functional status, costs and disability --- healthcare organizations need to be addressing the effectiveness of overall management in a more systematic way.

Context: Patient Safety at the McGill University Health Centre

The McGill University Health Centre (MUHC) is composed of 5 teaching hospitals that merged in 1997, and quite recently, a community hospital was added to this health system in summer 2009. It constitutes the largest teaching center of McGill University, and includes the Montreal Children's Hospital, the Montreal General Hospital, the Royal Victoria Hospital, the Montreal Neurological Hospital and the Montreal Chest Institute. The 6th hospital is the Lachine General Hospital, which was not part of this project. With over 1,300 beds and 12,000 staff it is one of the largest health systems in Canada; there are approx. 36,000 admissions/year, over 600,000-outpatient visits/year, and it operates on a budget of approximately \$650 million from the Ministry of Health. An internationally renowned research center, there is a strong emphasis on basic and clinical research that permeates the organization.

Falls. Falls are the most commonly reported incident at the MUHC. Fall injuries contribute to increased morbidity (illness), longer lengths of stay (access), and significant avoidable expenses (costs). In 2003, 1,100 falls were reported annually at the MUHC, 33 % of which resulted in injury causing harm and 1.4 % causing permanent injury. While fall frequency data has been collected for years, measurement and reporting of fall-injury

severity began only in 2003. There was no information on the economic impact of falls annually, at the MUHC, aside from settlement costs. In 2001-02, costs for 6 cases equaled \$ 894,980; in 2002-03, costs for 7 cases were \$ 771,345; in 2003-04, 2 settlement cases exceeded \$ 3 M (0.5 % of global operation budget).

An indirect measure of other fall-related costs relates to expenses for constant observation. In 2002, I was asked to lead an institution-wide review of high costs related to use of “sitters”.... external agency personnel hired to reduce risks associated with vulnerable populations admitted at MUHC. In 2002, expenditures for this resource topped \$2.2M. The review examined: financial and IS support systems, environment, interdisciplinary care processes, and development of new decision-support tools and clinical practice guidelines. This project involved creating structures and processes to bring about significant cultural changes across 5 hospitals. Success in reducing costs was achieved by bringing together people who normally do not interact, to develop new collaborative relationships, trust and common goals to improve patient safety. A key lesson learned was that falls prevention strategies needed to be far more evidence-informed --- as the reality was that sitters were frequently hired instead of ensuring the utilization of best fall prevention practices. Weeks and Wallace (2003) the U.S. Veterans Health Administration, in arguing for “broadening the business case for patient safety” point out that the indirect costs associated with preventable errors and adverse events are likely to be much more motivating to healthcare decision makers than the costs of litigation.

Pressure Ulcers. In 2003, a sample of approximately one third of in-patients was examined to determine pressure ulcer prevalence. This work, undertaken by a small

group of practitioners over three months, found 1 in 5 patients had evidence of pressure ulcers.

Pain. In 2003, there was no corporate level data about the effectiveness of pain management at the MUHC, other than patient satisfaction with pain management. There was no harmonization of pain assessment tools, as 2 sites used a 0-10 point pain scale, while 3 sites used a 0-5 point visual analog scale, precluding any ability to compare data. Documentation of pain levels and pain management interventions were very incomplete.

Despite having a formal commitment to reducing risks and improving patient safety, the MUHC was lacking a clear and evidence-informed organizational approach specifically addressing adverse event reduction, posing legal liability and patient satisfaction issues, as well as a growing fiscal toll. While there had been efforts to implement evidence-informed fall and pressure ulcer prevention care by a very small number of inpatient units within the 5 hospitals of the MUHC (< 10 %), there had been no attempts to develop an *organization-wide systematic* approach to prevention based on best evidence. Other “system” limitations included: lack of definition of a fall, likely underreporting of falls and pressure ulcers, the absence of a computerized point-of-service information system to track falls, pressure ulcers or pain levels, specific resources dedicated to prospectively review fall events and provide prevention training, lack of appropriate resources/ equipment at point of care (beds, alarm systems on beds and chairs, lifts, other safety devices) and a general lack of awareness by many clinicians about adverse event prevention.

No single action can, by itself, keep patients safe from healthcare errors. Because multiple components and processes of healthcare organizations create situations that

nurture errors in the work environment, multiple, mutually reinforcing changes in those environments are needed to substantially increase patient safety. In addition to addressing workforce issues, improving the design of work processes, and ensuring effective leadership, it is critical that the organizational culture is one that fosters a commitment to vigilance to preventing errors and reporting.

The evidence on implementation and sustainability of evidence-informed practice and innovations, in general, is difficult to disentangle from that on change management and organizational development (Greenhalgh et al., 2004). Adoption is a process rather than an event. It is often described as having five stages: awareness, persuasion, decision, implementation and confirmation. The evidence from Greenhalgh's systematic review suggests a messy model of assimilation, in which organizations move back and forth between initiation, development, and implementation, punctuated variously by shocks, setbacks and surprises.

Success in implementing and sustaining an innovation in service delivery and organization depends on many factors. Greenhalgh et al. (2004) found evidence that planned dissemination programs are most effective if they take full account of the needs and perspectives of the potential adopters, and where strategies are tailored to the demographic and cultural features of different groups. Organizations that are most likely to successfully adopt innovations are large, mature and specialized. Suitable communication channels must be used, with appropriate messages. Evaluation and monitoring are also crucial to the successful uptake of the innovation.

Substantial investments have been made in developing and testing the efficacy of clinical innovations that improve the health of patients and their families. Elizabeth

Bradley in her Commonwealth Fund report (Bradley et al., 2004) highlights the serious challenges of translating innovations into actual practice, indicating they are often only partially adopted, if at all. Governments, funding agencies and foundations are particularly concerned about ensuring the adoption of effective and beneficial health care innovations, given the current constraints on resources and the growing demands for greater accountability with healthcare expenditures. As Bradley points out, it becomes all the more important to understand which methods work best.

The numerous complex factors influencing the successful adoption of innovations by organizations have been described in literature on diffusion (Baker et al., 2008; Bradley et al., 2004; Ferlie, Fitzgerald, Wood & Hawkins, 2006; Grol & Grimshaw, 2003; McCormick et al., 2002; Rogers, 1995; Rycroft-Malone et al., 2002; Stetler, Ritchie, Rycroft-Malone, Schultz & Charns, 2007). First, the roles of senior management, clinical leadership, and credible data are important to success. Second, diffusion does not occur spontaneously. It requires the creation of an infrastructure dedicated to translating the innovation from a research setting into a practice setting. Finally, specific features of the innovation and the diffusion effort are central to the speed and success of diffusion. The translation process also depends on the characteristics and resources of the adopting organization, and on the degree to which people believe that the innovation responds to immediate and significant pressures in their environment (Bradley et al., 2004). Given these important realities and the complex interaction between factors such as the nature and acceptability of the evidence, organizational contexts, and the role of facilitation of strategic change, our approach was multi-faceted and multi-level.

A key assumption underlying our best practices program approach is that organizational change is integral to the achievement of, ongoing success with, and sustainability of innovations in health care (Ferlie et al., 2001; Greenhalgh et al., 2004). It is further assumed, based on research literature on organizational change, that such change has to be led and strategically managed (Buchanan et al., 2003; Redfern & Christian, 2003). Considerable efforts have focused on carefully attending to strategic change at all levels throughout this program. A final assumption is that such change is highly complex, and its study must account for significant dynamics within the change process relative to multiple levels within an institution (Greenhalgh et al., 2004; Pettigrew, Ferlie & McKee, 1992; Stetler et al., 2007).

Pettigrew et al. (Pettigrew, Ferlie & McKee, 1992) have identified several factors related to more successful strategic change. These factors or “characteristics of receptivity” include the following: quality and coherence of policy; key people leading change; supportive organizational culture, including the managerial subculture; environmental pressure; good managerial and clinical relations; co-operative inter-organizational networks; a fit between the change agenda and its locale; and the simplicity and clarity of organizational goals and priorities. These factors are dynamically linked and form a pattern receptive to the desired change or innovation.

Research has recently documented what has long been known to care providers: how well we are cared for by nurses directly affects health outcomes (Aiken, Clarke, Slaone, Solcholski & Silber, 2002; Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002; IOM, 2004; Seago, 2001). Nursing actions such as ongoing monitoring of patient health status, care coordination, nursing intercept of healthcare errors before they can adversely

affect patients, and their presence in almost all healthcare delivery systems illustrate the centrality of nursing care in achieving good patient outcomes.

In 2002, as part of the quality and safety initiatives of the MUHC Nursing Department, three nurse-sensitive outcome indicators were targeted for improvement: falls, pressure ulcers and effective pain management. In 2003, an interdisciplinary Skin Integrity Task Force was established. In January 2004, the department was awarded designation as one of nine National Spotlight Organizations for the implementation of the Registered Nurses Association of Ontario Best Practice Guidelines (RNAO BPGs). This was the first major initiative since the merger of the 5 hospitals that required significant buy-in and collaboration from the very distinct cultures within nursing (and the organization at large) across the different sites. The intent was to transform the organization by introducing more evidence-informed decision-making processes at both the administrative and clinical levels throughout the 5 hospitals.

This paper will report on the strategic changes from the bedside to the Board and work re-organization that were implemented in this “best practices program” between 2004-08, that I have co-led with Dr. Judith Ritchie. Multi-level, system-wide changes were put in place implicating decision-makers, clinicians, patients, researchers and technical service staff, at the macro levels (Executive, Unions and Board), at the meso levels (managers of many service departments and clinical areas) and micro levels (bedside clinicians in nursing, medicine, rehabilitation therapy, and pharmacy). This initiative included a program of externally funded research to more systematically track outcomes, and was also funded by the Quebec Ministry of Health, in line with efforts to develop work redesigns to improve the quality and efficiency of health service delivery in

the province. I will trace the processes used, the results to-date and the lessons learned from this major organizational transformation aimed at reducing adverse events and strengthening a culture of safety within a large health system.

Goals of Project

Goal 1. Reduce falls, fall injuries, and pressure ulcers by at least 20 % by 2007 and reduce the percentage of patients reporting moderate to severe pain levels, through the implementation of evidenced-based best practice guidelines in acute care.

This involved the following specific objectives:

- a) Implement three best practice guidelines aimed at reducing adverse events and better pain control across 5 hospitals to improve patient, practitioner and organizational outcomes (establish new infrastructure support; pilot test implementation and revise as needed prior to full roll-out across sites; provide the knowledge transfer guidance to all relevant disciplines and departments; ensure appropriate linkages across many departments, professionals and sites). Identify and address work re-organization issues associated with strategic changes at multiple levels of the organization.
- b) Evaluate the impact of implementation of best practice guidelines (BPGs) at the patient and practitioner levels.
- c) Improve corporate clinical-administrative reporting/ monitoring systems related to adverse event reporting to allow benchmarking and better performance management at the mid-management and executive levels.

Goal 2. Develop a stronger culture of safety and evidence-informed decision-making by increasing “organizational readiness” regarding the impact of adverse events, and linking the organization’s performance directly to safety outcomes.

This involved the following objectives:

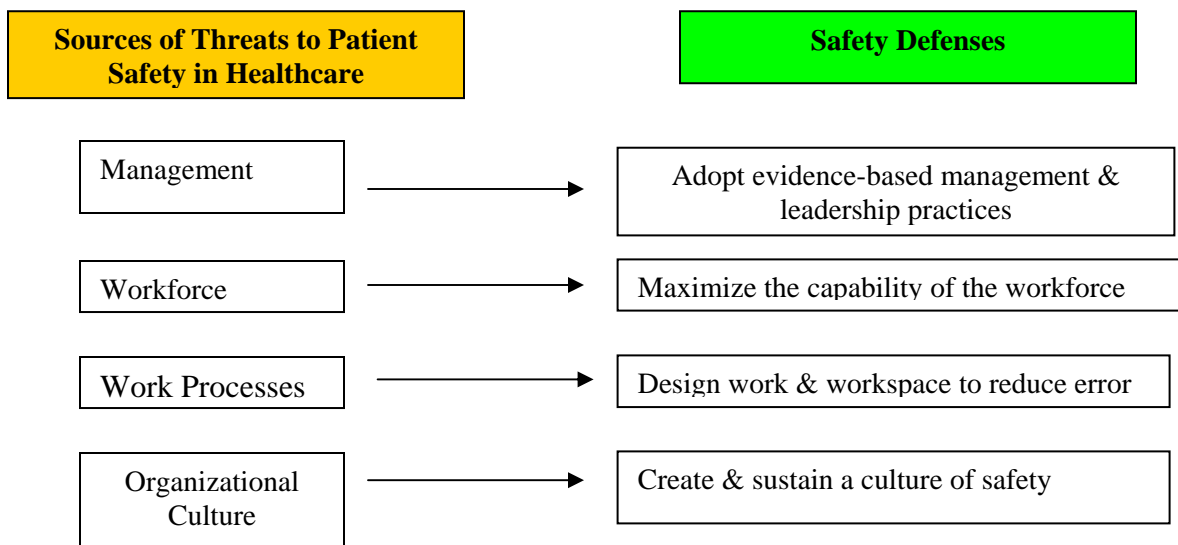
- a) Evaluate the impact of implementation of best practice guidelines (BPGs) at the *organizational (system)* level.
- b) Develop a business case for falls safety by evaluating the corporate resources needed to improve safety practices and the potential cost avoidance by taking preventive action.

- c) Obtain funding for the BPG Implementation “Best Practices Program” to support sustainability and spread.
- d) Strengthen the safety culture of the organization.

Conceptual Frameworks Guiding the Project

Two frameworks were particularly useful in guiding this project, although several others also informed the process. The first framework was developed by the Committee for the Work Environment for Nurses and Patient Safety commissioned by the U.S. Institute of Medicine (IOM, 2004) and funded by the U.S. Agency for Healthcare Research and Quality. Using Reason’s model (Reason, 1990) and the strong and convergent evidence obtained from studies of highly reliable organizations, research on work and work-force effectiveness, health services research, and human factors analysis and engineering, this framework links those evidence-based mutually reinforcing practices/ interventions essential to error reduction and patient safety within four fundamental components of all organizations: (1) management and leadership, (2) workforce deployment, (3) work processes, and (4) organizational culture.

Figure 1. Sources of threats to patient safety in the work environment and corresponding safety defenses



Within the MUHC, the aspects of management that were a particular focus included the receptivity of leaders at executive, senior and middle management to support these changes in both clinical practice and administrative practices, including performance monitoring and measurement. Work force and work processes examined in our work included a large range of interventions: ensuring time available to learn new practices, modifying documentation systems, examining roles amongst health care disciplines (RNs, patient attendants, physiotherapists, wound care specialists, quality and risk department consultants, and researchers working on the task forces), conducting equipment and environmental scans and acquiring needed prevention equipment. Organizational culture was examined via measures such as safety climate, receptivity to change, and support for BPG implementation.

The second framework guiding much of the knowledge transfer project work is the Promoting Action on Research Implementation in Health Services (PARIHS) framework (Kitson, Harvey & McCormack, 1998; Rycroft-Malone et al., 2004). The framework proposes that successful implementation of evidence into practice is dependent upon the nature of the evidence being used, the quality of the context, and the type of facilitation utilized. Creators of the framework readily acknowledge that implementing evidence and developing practice is far from straightforward and often challenging.

Definitions for the key elements of the PARIHS framework and how they were operationalized in this work:

- **Evidence:** as derived from well-designed research, clinical experience/ expertise/ consensus, patient experiences and partnerships with health professionals, and information from the local context, which is valued, collected, evaluated and reflected upon. In this project it includes all of these elements. This was examined

using the following key sources of evidence: a) three evidence-informed best practice guidelines developed by the Registered Nurses Association of Ontario (fall injury prevention, pressure ulcer prevention and pain management) which incorporate a synthesis of the research literature; b) falls prevention resources of the U.S. Veterans Health Administration; c) local patient satisfaction data relating to pain management; and d) staff surveys of the usefulness of the BPG to improve practice (completed with pilot units).

- **Context:** relates to receptivity to change, culture, leadership, and measurement. Receptivity includes appropriate and transparent decision processes; boundaries well defined; adequate resources for change; and changes that are aligned with strategic goals. Culture includes prevailing beliefs and values; valuing of staff/ clients/ teamwork and relationships; use of rewards/recognition. Leadership is seen as transformational, there is role clarity, effective teamwork and organizational structures, and democratic inclusive decision-making processes are present. Measurement relates to providing feedback on individual/ team/ system performance, and use of multiple methods of performance evaluation. Context was examined via: a) examination of the impacts of unit culture and leadership on the implementation processes with each inpatient unit obtained during focus groups and informal discussions with staff; b) staff surveys of the safety climate and surveys specific to the perceived support for BPG implementation (from managers, colleagues and others outside the unit).
- **Facilitation:** refers to the critical facilitator roles of project leaders, champions and change persons in enabling the translation and particularization of evidence into practice by working with individuals and teams to develop their practice and shape their local contexts. It involves a range of important skills and attributes: project management, technical and marketing skills, clinical credibility, co-counseling, critical reflection, flexibility of role, ability to form partnerships (internal and external), and use of adult learning approaches. Facilitation was examined via: a) staff surveys about the adequacy of educational and support processes during the implementation process on their unit; b) continuous review and modification of the support processes via discussions with task force co-chairs, advocates, managers, unit-based champions, unit staff; c) monthly discussions with the nursing executive group to exchange feedback about progress.

Other useful frameworks and literature that informed this project derive from the safety field, organizational learning and change, sustainability of effective practice changes, and leadership effectiveness. They include: Baker and Norton's conceptual model (Baker & Norton, 2001) for making healthcare safer, Solberg et al's model (2000) for effective guideline implementation and the UK's National Health Service Guide to

Sustainability and Spread (NHS Modernization Agency, 2002). The National Patient Safety Center (U.S. VHA) was a very useful website with many practical tools.

Methods

Goal 1

Reduce falls, fall injuries, and pressure ulcers by at least 20 % by 2007 and reduce the percentage of in-patients reporting moderate to severe pain levels by 50 %, through the implementation of evidenced-based best practice guidelines across the pre-hospital to post-hospitalization phases of care delivery. The interdisciplinary task force members chose reduction targets.

Objective A. Implement three best practice guidelines aimed at reducing adverse events and better pain control across 5 hospitals to improve patient, practitioner and organizational outcomes. Identify and address work re-organization issues associated with strategic changes at multiple levels of the organization.

Assessing Organizational Readiness

Given that the Best Practice Guideline Implementation Program was the single largest initiative undertaken by the Nursing department since the merger of 5 institutions, there was considerable uncertainty about our capacity and the outcomes. There were a number of obstacles to overcome or manage: the size of the organization (12,000 employees), its geographic spread across 5 sites (travel time for any meetings), its complex organizational structure (medical and nursing services are organized within “missions” each with its own senior operations leadership team, the other disciplines report through different administrative structures), turnover rates, short-staffing and high overtime negatively influencing readiness to take on new challenges, significant lack of computerized information systems, multiple charting systems (not unified across sites)

and perhaps most significant were the very distinct cultures, policies and procedures, and considerable territorial behavior.

Despite these barriers, there were several important contextual factors facilitating organizational readiness for launching such a large change. These included:

- A history of evidence-informed care and leadership, and a culture of inquiry at the MUHC;
- Being relatively resource rich with 35 expert nurse educators and 60 clinical nurse specialists already involved in quality monitoring and knowledge transfer activities;
- Two task forces (Pain Management Task Force, Skin Integrity Task Force) had already been established during the previous year (2003) to begin the preliminary work of literature searching and identification of best practices currently in place at the MUHC.
- By virtue of being awarded (via a national competition) a “National Spotlight Organization” status for the Implementation of the RNAO Best Practice Guidelines, we received important resources (\$100,000) and status, both externally and perhaps more importantly, amongst the internal community. This was helpful in increasing “buy-in” from groups within and outside of Nursing in the organization.
- The funds were used primarily to ensure paid release time for staff in attending learning sessions, which was an important condition for nurse manager buy-in, as most units are understaffed and on tight fiscal management.
- RNAO expert teams already critically reviewed the guidelines, so our own clinical teams were saved this time-consuming step.

Building the Teams & Infrastructure Support for Change

Launching. Two strategic decisions were made in early 2004 that set the stage for accelerating the adoption of best practices and transforming our organization into being more evidence-based in its administrative and clinical decision-making.

- The first involved putting forward our application in the nation-wide competition to be selected as one of nine National Best Practice Spotlight Organizations. While 7 of the designations were awarded within Ontario, the other 2 were in Quebec. This occurred in late January 2004, and our MUHC BPG Program was then launched in February 2004.
- The co-directors of this initiative included: Christine Covell, Judith Ritchie and I (a senior nurse educator, a research director and a senior clinical director). By

- 2006, Christine Covell left to pursue doctoral studies and the program continues to be led by JR and POC. The award carried with it start-up funds of \$100,000.
- The second involved my being accepted as a CHSRF Fellow in the Executive Training in Research Application (EXTRA) program (2004-06). This required CEO endorsement of the fledgling best practices program, which immediately signaled its importance as a corporate priority. This award provided important protected time to dedicate to this initiative. Being in the first cohort of the EXTRA program also brought recognition to the organization.

Key Elements of BPG Infrastructure. Appendix 1 illustrates the main infrastructure supports for the BPG program e.g. BPG Senior co-directors, 3 task forces, BPG Steering Committee, unit-based leadership team and champions/coaches. All teams are accountable to the pre-existing Council of Nurses, whose mandate is to ensure quality of practice, and MUHC Nursing Executive Committee. It is important to note that there was no budget whatsoever for new staff to support this program. All roles described below are responsibilities taken in addition to the ongoing roles that each individual already assumed. Given the heavy work overload conditions of most health care workers these days, this remains still an amazing feature of the transformation.

BPG Coordinator. Two years into this program development, we were successful in obtaining external funding for a BPG Coordinator whose role was to support the task forces and unit-based implementation teams by: organizing all materials needed for workshops and training sessions, posters for units, preparing the resource binders for each unit at time of implementation, organizing focus groups at mid-point and post implementation, and assisting in project evaluation. The detailed role description is in appendix 2. Funding of this role came from two sources: a Ministry of Health work re-organization grant and external research grants.

Advocate Role. Having established the senior leadership structure to guide the project, the next step involved identifying six clinical leaders to be trained for a week in Ontario, as best practice advocates. The role of advocates was to work as *change agents/facilitators across the five sites* supporting inpatient units who would be implementing the practice guidelines. This was the first time these individuals had cross-sited responsibilities, all of which were outside their usual daytime jobs. Discussions with the nursing executive group, the Council of Nurses and members of the two existing task forces for skin and pain generated a list of willing volunteers who were largely led by curiosity. Within 6 months of launching the Best Practices project, we had trained a cohort of 11 evidence-based practice “advocates” who were well placed across all sites/clinical missions to facilitate “penetration and uptake” across the organization. Early on the advocates themselves adopted a definition of their role that “fit”. The advocate is “a person who believes in an idea, will not take no for an answer, is undaunted by rebuffs and above all persists.” As time progressed, we realized they were extraordinarily prescient! The advocates had given workshops to over 200 staff regarding evidence-based practice by October 2004 (9 months into the project).

BPG Steering Committee. Co-led by Dr. Ritchie and myself, it included task force co-chairs, the Advocates, several non-nursing clinical department heads, the Director of the MUHC Quality program, and three researchers. They provided support and oversight to the work of the task forces, developed the Guiding Principles for the BPG work (appendix 3) and developed an extensive communication plan using the intranet and many other methods at multiple levels in the organization. MUHC project leaders had access to bi-monthly national teleconferences with the other 8 National Spotlight

organizations for the sole purpose of sharing our learning experiences in trying to create large systems-wide evidence based care and decision-making. These factors significantly increased our capacity.

Task Forces. As mentioned, the pain and skin integrity task forces had been formed the year prior to being designated a Spotlight Organization. The task forces are interdisciplinary groups of 16-25 persons, generally including: patient representatives, managers, educators, staff nurses, patient attendants, physiotherapists, occupational therapists, physicians, pharmacists, a Quality department representative, and a researcher. These individuals are considered the “clinical experts” in the particular BPG domain, and they have been given the full responsibility for decision-making related to the implementation process. This degree of freedom and accountability is a key feature of the way in which the BPG program was structured.

The co-chairs of the task forces are responsible for organizing all planning and follow-up meetings with a given unit throughout the entire implementation period (8-12 weeks). They provide the teaching about the particular BPG, to the unit-based staff who volunteer to be unit *champions*. They and the Advocates frequently visit the unit during implementation to trouble-shoot, provide support and guidance. The Pain TF is co-led by 2 pain clinical nurse specialists; the Skin Integrity TF by a Nursing Practice Consultant and a clinical nurse specialist; and the Falls Task Force, originally co-led by a nurse educator and Geriatric clinical nurse specialist, is now led by a nurse manager in Geriatrics. An example of the interdisciplinary membership of the task forces is listed in appendix 4 (Falls task force).

Each task force was given \$5,000 to support their work. In order to ensure good linkages, each of the co-directors was a member of a task force (Dr. Ritchie – skin integrity; C. Covell – pain; P. O’Connor – falls).

Researchers embedded on Task Forces. A key and novel aspect of the task force membership was to include a researcher. In addition to bringing more rigor to the analytical processes, they played a strong role in facilitating use of latest evidence from the clinical and educational learning domains. It modeled in a very practical way the benefits of clinical–research interactions to improve safety.

Falls Task Force. In spring 2004, I began the work of putting together the Falls Prevention task force. Strategies to engage potential co-chairs and task force members included use of incentives and stakeholder engagement at the nursing executive level. At the start of this project, there were only a few units within the MUHC who were engaged in falls best practices. Their excellent work was occurring in “silos” unbeknownst to most others across the 5 sites of the MUHC. In order to rally these champions to work for the first time at the full organizational level, I lobbied for resources held by nurse executives to pay for 6 interdisciplinary leaders (staff nurse, manager, two educators, a physiotherapist and a nurse executive-myself) to attend the annual Falls Prevention Conference sponsored by the Veteran’s Health Administration VISN 8 in South Florida. This 4-day conference brings together the top in the field to focus on evidence-based strategies to reduce fall injuries and improve patient safety. During that week, I led planning discussions with these champions to brainstorm the creation of an MUHC Falls Task Force. The combination of a very stimulating learning environment, a sunny break from the Canadian cold weather, and time to informally start to meld as a group, was

powerful in shaping a dynamic team committed to attempting change on their return.

Over the following weeks, I met with some of these persons to explore who would take on the co-chairing roles. By June, they ultimately made the decision amongst themselves, an important step in ownership and commitment.

The co-chairs and I recruited the remaining members of the Falls Prevention task force based on an initial stakeholder analysis, an environmental scan of areas most affected by fall injuries, and discussions with the senior leaders of each of the six clinical missions of the MUHC. Careful to include representatives of all adult sites, members include: a frontline staff nurse, nurse managers, clinical nurse specialists, nurse educators, researcher, physiotherapist, physician (geriatrician), pharmacist, Quality department member, and a patient representative. While the pediatric hospital was encouraged to be involved, they were reluctant given the practice guideline was developed for adult populations.

The task forces meet monthly year round. In the initial months, it became clear that other nursing quality groups (some of the site committees) were confused about perceived overlap between their work and that of the newer BPG task forces. This was leading to conflict, pushback, and duplication of efforts. Dr. Ritchie and I met on multiple occasions with site quality committees to clarify mandates and provide reassurance about the work re-organization. In addition, a communication sub-group of the BPG Steering Committee was created to ensure ongoing multi-media communication occurred across the organization. In fact, throughout the 5 years of the best practices program, this need to constantly communicate with multiple groups and work through issues of communication and linkages has been a constant challenge.

The co-leadership model for the task forces has been an important factor in their sustainability, as co-chairs could regulate their levels of engagement given the other demands of their regular jobs within a given clinical division/mission. These co-chairs are recognized as clinical experts and opinion leaders, and are Master's-prepared nurses with strong leadership skills. While turnover has occurred amongst the chairpersons, it's been interesting to note that persons stepping out of the co-chair role nonetheless remained on the task forces. Over time, important learning occurred about the need to allow for such flexibility and to encourage it; a painful lesson at times, given the co-chairs are a very high performing group who felt guilty about "stepping down" for a break.

Unit-based Leadership Teams and Champions. The core leadership team on each unit is generally composed of a nurse manager, assistant nurse manager(s), a nurse educator (shared between units usually), and partial clinical nurse specialist resource. In addition, units were asked to identify through a volunteer process frontline caregivers who were interested in being unit champions/coaches to their peers. Champions ranged from 2-10 on any given unit (some units like ICUs, had over 125 staff). These persons were directly involved in supporting the practice guideline implementation, providing frequent reminders, recommending ways to improve implementation processes, and conducting performance audits to measure changes, with feedback then to staff about their progress.

Partnership with another Best Practice Spotlight Organization in Quebec. A final aspect of infrastructure support that we created was a new partnership with hospital Charles LeMoynes Hospital, a teaching center with University of Montreal. When we

realized they, too, had also been selected as a National Spotlight, we contacted their Director of Nursing, who'd previously worked at the MUHC, to suggest the collaboration. We continue to meet with them every 3 months to compare our similarities and differences in change processes and outcomes, and this collaboration has been very positive and helpful.

Best Practice Guideline Rollout Process

Given the critical importance of facilitation (Kitson et al, 2002) and engaging managers in the process of change management, we surveyed all nurse managers in the summer of 2005 regarding their preference for which BPG they wanted to implement first, and at what time during the year. Managers were provided with annual prevalence data for their units to guide their priority decision-making process e.g. they could see their unit's performance relative to the MUHC average rates for pressure ulcers and falls, and the rates of moderate to severe pain. A schedule was then established in collaboration with the nurse managers of the 45 units across the 5 hospitals, prioritizing when they wanted to implement each of the 3 BPGs. Each BPG schedule was for approximately a two-year period. Then the process was repeated, and another two-year implementation schedule was created.

The following were the basic principles of the implementation process:

- Each BPG was first pilot tested on 3-4 units, to see what needed to be modified, in terms of the practice changes, documentation systems or the educational and facilitation processes needed. The piloting process was established as a fun, competitive one where units had to "compete" to be selected as a pilot. See appendix 5 for an example of the Pilot Contest form.
- One BPG was implemented at a time on a given unit.
- The intensive implementation was 8-12 weeks duration on each unit, depending on unit size. See appendix 6 for sample unit-based implementation schedule.
- **Units prioritized for "intensive" BPG implementation were those whose prevalence rates were at or above the MUHC average.**

- For falls and fall injuries, the rate was an incidence rate. An *incidence rate* is the number of new cases per unit of person-time at risk (Higginson et al., 2003). In our case, the measure of time is one fiscal year, and the denominator is patient days e.g. fall occurrences per 1,000 patient days. This incidence data was obtained via completed incident reports submitted to our Quality and Risk department.
- For pressure ulcers and pain at moderate to severe levels, we used prevalence as the measure of rate, given that the MUHC has no reliable measurement of incidence at this time. Prevalence of a disease in a statistical population is defined as the total number of cases of ... in the population at a given time, or the total number of cases in the population, divided by the number of individuals in the population. It is used as an estimate of how common a condition is within a population over a certain period of time (Higginson & Constantini, 2003).
- At the MUHC, given the lack of electronic charting and limited resources for ongoing measurement, the prevalence rates are measured once a year across the 5 sites, recognizing however that this measure is inferior to that of actual incidence or multiple prevalence measurements.
- Other *contextual* factors sometimes played a role in the timing of roll-out for a given unit. If there were other major concurrent changes occurring on the unit the timing was often delayed e.g. large scale renovation or physical move, absence of the manager and assistant manager due to leaves or illness, or factors such as severe staffing shortages.
- Units whose rates were *below* the MUHC average were not targeted for this type of rollout. In 2008, “mini implementation” strategies began to be developed for units with lower prevalence rates.
- A Road Map to BPG Implementation was prepared and extensively circulated to all clinical areas and to mid-and senior management levels to ensure everyone in the organization understood the overall process and plan (shown in appendix 7).
- From 2004-07, three cycles of implementation (fall, winter and spring)/ year were scheduled, with 3 units per BPG implementing in each cycle (9 units at a time).

Table 1. Sample Schedule of BPG Implementation Cycles (3 cycles per year)

Autumn	Winter	Spring
Pressure Ulcer Prev. BPG: Units 1,2,3	Pressure Ulcer Prev. BPG: Units 10,11,12	Pressure Ulcer Prev. BPG: Units 19,20,21
Falls Prevention BPG: Units 4,5,6	Falls Prevention BPG: Units 13,14,15	Falls Prevention BPG: Units 22,23,24
Pain Management BPG: Units 7,8,9	Pain Management BPG: Units 16,17,18	Pain Management BPG: Units 25,26,27

- In 2008, we changed to two cycles per year (autumn and winter), increasing up to 5 units per BPG at a time.
- Annual prevalence surveys of pressure ulcers and pain were conducted to measure organizational performance. Falls rates were provided via the Quality department.
- Several weeks before a unit’s scheduled implementation began, the co-chairs of the given task force met with the leadership team of the unit (nurse manager,

- assistant nurse manager, nurse educator, and clinical nurse specialist) to review the implementation plan.
- Following this meeting, the unit leadership team asked for volunteers amongst the in-patient unit staff to serve as unit champions/ coaches during and after the implementation. Champion volunteers included: staff nurses, patient attendants, physiotherapists and occupational therapists.
 - Champions received group-training vis-à-vis the content of the best practice guideline as well as training related to effective change management. They then provided the teaching to all unit staff, assisted by the task force co-chairs and Advocates. In general, it took approximately one month to provide learning sessions to 90 -100 % of staff.

Choice of Evidence-based Interventions. A key benefit of the RNAO Best Practice Guidelines is the fact that a systematic review of the evidence on effectiveness of interventions had already been conducted, a major time-saver for organizations wishing to use them. Each BPG also included recommendations for educational interventions with patients, families and practitioners, as well as policy recommendations.

Given the Falls BPG was produced in 2002, their literature review was somewhat dated by the time of our piloting (2005) and implementation (2006). I established a small team of a nurse researcher, a clinical specialist, a Quality department member, and myself to conduct the gap review (2001-present) over a period of four months. The focus was on: systematic reviews for falls interventions, individual research studies and expert opinion literature, economic evaluation studies, clinical practice guideline effectiveness reviews, and sustainability and spread. Key findings of these reviews were presented on an ongoing basis at meetings of the TF, and they were useful in guiding choices of fall interventions/ outcomes, and tool development. During several monthly meetings, discussions focused on the interventions recommended by RNAO, as well as those detailed in the Falls Toolkit Notebook (NCPS website) produced by the VA National Center for Patient Safety. The implementation strategies chosen were multiple, evidence-

based bundled interventions drawn primarily from systematic reviews of knowledge transfer interventions (Bero et al., 1998; Thomas et al., 1999). An example of one of the interventions for preventing falls, an environmental audit, is shown in appendix 8.

Pilot Testing on 3-4 Clinical Units. As described earlier, the choice of pilot units was determined by an open contest across the organization. Applications were received and the selection was done by a team consisting of one representative of each of the sites, Council of Nurses Quality Committees. This was to ensure no bias in selection, which in the context of persisting strong individual site cultures, was seen as critical. Competing units had to demonstrate that they had strong commitments for the implementation process by identifying *a team of champions*, as well as having interdisciplinary involvement and buy-in from the nurse manager. Pilot testing for the pressure ulcer and pain BPGs occurred in 2004, and the falls BPG in late 2005.

Educational Interventions and Facilitation Processes. Initial training of Advocates occurred by sending teams to Ontario for several days, on two separate occasions in 2004. Later in 2007, we co-hosted (with RNAO faculty) a training workshop in Quebec to which we invited many regional partners. Full-day interactive educational workshops entitled *Taming Change* were also held with each unit leadership team and their champions; 94 persons attended four sessions. Then, following a train-the-trainer-model, the champions with the assistance of the task force co-chairs and Advocates led the unit-based sessions. The format chosen respected the current ones used by the individual units, so that on some units the sessions occurred in two half-day sessions that all staff attended, having been released from their daily responsibilities; whereas on other units, the learning sessions occurred in small groups or one-on-one sessions. The content

focused on: local prevalence statistics, risk factors, costs to the system, impact on quality of life, risk assessment tools such as the Morse (for falls) and the Braden (for skin breakdown) and the internally developed documentation tools for charting interventions. Case studies were used, as well.

Support teams were created for every unit's implementation, consisting of the external supports (task force co-chairs, Advocates) and internal supports (unit leadership team and frontline champions). Facilitation support occurring during the 8-12 week implementation period, included:

- Regular informal audit of charts and feedback sessions to staff (done by the champions, nurse manager or BPG Advocate assigned to the unit),
- Focus groups led by the TF co-chairs and Advocates approximately at mid-point and near the end of the implementation period with the unit leadership (see appendix 9 for focus group interview questions)
- Use of reminders, and assigning unit coordinators to pre-assemble patient charts with the new assessment tools included.
- Marketing with BPG posters and lanyards
- Providing each unit with: BPG toolkit binders (see appendix 12 for an example), pocket tools for all nurses e.g. fall interventions and medication alerts.
- Regular visits to the unit by the BPG Advocates and co-chairs to provide encouragement, celebrate each small success, and trouble-shoot when problems arose. It was particularly important to provide this ongoing presence and support, as there were many competing priorities on each unit, as well as they pressures due to short staffing.

Communication Strategies: Regular communication aimed at multiple levels of the organization occurred to increase awareness of the BPG project, provide regular updates of progress and to ensure broad stakeholder engagement.

Objective B. Evaluate the impact of implementation of best practice guidelines (BPGs) at the patient and practitioner levels.

The ability to monitor outcomes was a serious problem at the start of this project, and was indeed a major stimulus for creating organizational change related to adverse events and patient safety performance. As mentioned in the introduction, in 2004 there was no information about rates of pressure ulcers or effectiveness of pain management within the MUHC at the start of this work. While falls were being measured, it was not in a way that allowed for benchmarking comparisons, and there was no organizational definition of a fall being used.

The American Nurses Association (2002) and the National Quality Forum (2004) had already identified key nurse-sensitive quality indicators that should be monitored within acute care organizations; amongst those were pressure ulcers and patient falls. At that time the U.S. accreditation standards (JCAHO) had already incorporated specific requirements for assessment and management of pressure ulcers and fall injury risk into their accreditation surveys. This predated the required organizational practices introduced only in 2008 by Accreditation Canada. Our approach was to introduce the following methods of measurement:

- Patient Outcomes vis-à-vis Pressure Ulcers and Pain: Annual prevalence surveys of all in-patients were conducted by over 100 members of the Nursing department (bedside practitioners, all leadership staff, nurse executives, and the local site nursing quality committees). Beginning in 2004, one day per site was set-aside in the autumn for visiting each patient and reviewing the patient chart. Every patient's skin was examined, and pain levels elicited (pain at time of the survey and pain within the last 24 hours). In 2007, the surveys were expanded to include rates of restraint use.
- Patient Outcomes vis-à-vis falls: in 2004, we used the existing organizational data about falls collected via incident reports --- counted simply as the number of falls. By 2005, I had introduced a benchmark-able falls rate indicator (falls per 1,000 patient days) and a falls injury indicator (% falls with injury/ total falls) to the Falls Task Force and the Quality department. However, it took another two years before the Quality department began regularly reporting fall outcomes using this new system. In the meantime, the TF used the new system, and continued to push for adoption at the corporate level.

- Focus group feedback during implementation process on each unit
- Systematic measurement of practitioner practice changes occurred via a funded research study comparing implementation units with comparison units.
 - In summer 2005, Dr. Ritchie and I began a series of discussions about a possible BPG research program with the Advocates, co-chairs of the Skin, Pain and Falls Task Forces, and the 3 researchers working with us. It became clear that there was a group of persons willing to move this forward. Potential funding opportunities from a number of grant competitions were identified, a team of ten was constituted and a proposal developed for submission to the Canadian Nurses Foundation (Aug 2005), with matching support coming from the MUHC Research Institute and the Groupe de Recherche Interuniversitaire de Santé de Montréal (GRISM).
 - This first of two grants, entitled *BPG Implementation: Does Changing Nursing Practice Improve Patient Outcomes*, focused on comparison of patient and practitioner outcomes on implementation units versus comparison units, at baseline and 6 months post implementation.
 - A second research grant application entitled *The influence of context, facilitation and evidence on sustained change in nursing practice following implementation of best-practice guidelines* was submitted to the Canadian Nurses Foundation in 2007 to conduct further evaluation --- this time, of the factors affecting sustainability of BPG changes 18 months post implementation. Only parts of the study results will be described in this report. The practice improvement target established was at least a 10% increase in use of each of the evidence-informed practices. This was based on the work of Jeremy Grimshaw et al (2003, 2004). This second study was focused on systematically examining the key elements of the PARIHS model (one of the two guiding frameworks for all of our work).

Objective C. Improve corporate clinical-administrative reporting/ monitoring systems related to adverse event reporting to allow benchmarking and better performance management at the mid-management and executive level.

At the outset of the project, there was no data relating to organizational performance in preventing pressure ulcers and moderate to severe pain. Falls frequencies, only, were reported, as they were part of the provincial incident reporting requirements. The data was not benchmark-able as it was not calculated using parameters that allow comparison with other organizations e.g. falls / 1,000 patient days. So while the Board of Directors

Quality Committee regularly received fall injury data, it was not in a form that truly allowed accurate performance monitoring.

There were a number of challenges relating to measurement of injury severity levels. First, the severity measure adapted for fall injuries is the one created for medication errors by the Institute for Safe Medication Practices and includes nine severity levels. A simplified set of categories classifying falls, as mild, moderate and severe falls would be more practitioner and Board-friendly. Second, the local definitions for each injury severity category were not mutually exclusive leading to misleading reporting of injury severity. Furthermore, on the provincial reporting tool there was no place to note whether or not a fall risk assessment had already been completed prior to the fall, and whether any fall risk reduction interventions were in place at the time the fall occurred. In other words, the tool did not link process performance and outcomes, which is a critical component of accountability-based performance management.

Goal 2.

Develop a stronger culture of safety and evidence-informed decision-making by increasing “organizational readiness” regarding the impact of adverse events, and linking the organization’s performance directly to safety outcomes.

Objective A. Evaluate the impact of implementation of best practice guidelines (BPGs) at the organizational (system) level.

As health policy expert Ross Baker (2005) reminds us, improving patient safety is primarily a culture change. Many healthcare organizations are treating adverse events as a technical challenge, but the larger challenge lies in transforming the work and the patterns of behavior that have developed around the work. Creating and sustaining a

culture of safety occurs when organizations place as high a priority on safety as they do on production (fiscal performance). According to the PARIHS framework, culture includes prevailing beliefs and values; valuing of staff/ clients/ teamwork and relationships; and use of rewards/recognition. Leadership includes: transformational rather than hierarchical, role clarity, effective teamwork, effective organizational structures, and democratic inclusive decision-making processes. Measurement relates to providing feedback on individual/ team/ system performance, and use of multiple methods of performance evaluation (Kitson et al., 1998; Rycroft-Malone et al., 2004).

Characteristics of high reliability organizations include: permeating beliefs that most accidents can be prevented through good organizational design, management dedicates the time, personnel, budget, and training resources to bring about changes needed to make work processes safer, decentralized decision-making that allows staff to act promptly and flexibly, continuous learning/ training/ simulation are fostered to maintain high and reliable performance, and there is strong emphasis on communication and collaborative relationships. Carnino (IAEA International Atomic Energy Agency, undated), of the International Atomic Energy Agency observes that a culture of safety develops over time in stages, and is not easily accomplished. Of particular note in what he describes as stage 3 (high levels of safety mindedness), is the emphasis on the relationships within the organization: conflict is addressed and recognized; there is management support, with recognition and resources provided for collaborative work; and almost all mistakes are viewed as variability in work processes. The important thing is to understand what happened rather than to find someone to blame. This understanding is used to modify the work processes.

A key part of any implementation program includes evaluation. Both frameworks guiding this project point to the mediating effects of contextual or organizational factors on error reduction, patient safety and successful change. These attributes include: patient-centered learning organization, clearly defined and flexible roles, effective work teams and decision-making structures, previous experience in successful change management, culture for continuous quality improvement, leadership buy-in at all levels, clear direction and goals, presence of internal champions, implementation infrastructure, and consistent and appropriate presence and support.

The methods used to evaluate the organizational level impacts of implementation of best practice guidelines (BPGs) were as follows:

- a) *Survey of Staff Perceptions about the Worth of the BPGs, Organizational Support for BPG Implementation, and Educational and Facilitation Support processes.* We used reliable and valid survey instruments developed by the Community Health Research Unit, of the University of Ottawa (Edwards et al., 2004) to evaluate these perceptions on 11 pilot units.
- b) *Safety Climate Survey* using Sexton's tool, and *Organizational Support for BPG Implementation* (Edward's tool) were conducted on the 31 research study units (study #1): Bedside nurses were the study subjects. See appendices 10 and 11 for the actual tools.
- c) *Informal Observations of Other Changes:* We hypothesized that there would be other changes occurring throughout the organization as the best practices program took effect. It was anticipated these would include role changes amongst those participating in the implementations, changes in leadership competencies, and increased collaboration amongst multiple departments. We also watched for unanticipated effects.
- d) *Safety Environmental & Equipment Audits of the In-patient:* this emanated from work related to the fall prevention BPG. The Falls task force and members of MUHC Technical Services department conducted the audits.
- e) *Safety Environmental & Equipment Evaluations of Two MUHC Emergency Departments:* An unanticipated activity came in the form of a request from the MUHC Patient Safety Committee to provide support and guidance for fall risk reduction to the Emergency departments (ED). This followed the de-briefing of a fall sentinel event which had resulted in death at one of the site EDs, as well as a complaint lodged about a fall occurrence at another adult site ED. The TF saw this as an opportunity to increase awareness of adverse events and strategies to reduce fall risk in a very high-risk area of the organization. Teams conducted the

audits, held multiple information exchange sessions and are still working with the ED leadership teams to identify areas for further intervention.

***Objective B.** Develop a business case for falls safety by evaluating the corporate resources needed to improve safety practices and the potential cost avoidance by taking preventive action.*

Only one study was found that examined the costs associated with falls in the acute care setting. This retrospective case-control study compared costs of hospitalized patients with a fall resulting in a serious injury with matched controls, and revealed that the fallers stayed in hospital 12 days longer and had charges \$4,233 (U.S.) higher than controls (Bates, Pruess, Souney & Platt, 1995). This study was limited by the use of data on charges for tests and services instead of costs, which precluded generalizability of the findings to other settings and by the inadequate reporting of methods, which made it difficult to determine the specific breakdown of charges that were analyzed. A clear understanding of the specific costs associated with falls during hospitalization is critical to guide policy decision-making and justify the development of fall prevention programs in the acute care setting.

The approach to a cost analysis of falls at the MUHC included:

- Meetings with an economist (McGill University), epidemiologist (McGill University), Dr. Ross Baker (University of Toronto health policy expert), finance department representative, and the MUHC Associate Director for corporate equipment purchasing,
- Examination of the factors enhancing fall risk reduction to determine the most effective and efficient methods to use within our acute care organization,
- Analysis of the environmental and resource issues that limit effective fall prevention, including audits of existing fall prevention equipment across 50 + units.
- Identification of the costs associated with fall injuries and the rate of these injuries in the MUHC, by consulting with the Risk Management department. This involved a review of insurance claims from the period 2001-04.

- Review by members of the Falls task force of new patient beds and bedside furniture that would decrease the risk of falls (as the vast majority of patient falls at the MUHC occur at the bedside or in transit from bed to the bathroom)
- Comparative analysis of costs to maintain status quo (vis-à-vis clinical practices and equipment purchases) versus to invest in effective fall reduction equipment

Objective C. Obtain resources for the BPG Implementation Program to support sustainability and spread.

Like many cash-strapped healthcare facilities in Canada, resources are often insufficient. It is also the case that unglamorous items such as bedside commodes, modern electric beds, fall prevention alarm devices, and well designed patient furniture often do not catch the appropriate attention, relative to high cost surgical and diagnostic equipment. And arguments to spend taxpayer dollars on upgrades to old physical plants (the MUHC hospitals) only go so far, leaving many unsafe areas within the in-patient and ambulatory care areas. The approach to garnering more resources was to seek external and internal funds, as follows:

- a) Applied for National Spotlight designation with the registered Nurses Association of Ontario
- b) Sought funding via a nursing work re-organization grant from the Quebec Ministry of Health. This initiative was led by the other BPG Project co-leader, Dr. Judith Ritchie via a grant request of \$200,000 in June 2005.
- c) Sought research funding to allow for a more systematic examination of outcomes and sustainability of best practices related to fall and pressure ulcer prevention and better pain management.
- d) Sought internal funds from corporate equipment (operational) budgets and from different hospital Foundations of the MUHC.
- e) Solicited involvement of graduate students from McGill University and University of Toronto for academic project work related to BPG implementation or evaluation (free intellectual capital).

Objective D. Strengthen the safety culture of the organization.

This objective is a broad one aimed at increasing the extent to which evidence is used to influence administrative and clinical decision-making at the MUHC to improve patient and staff safety. In 2005, the MUHC began measuring work satisfaction along several dimensions via a staff survey conducted by the Human Resource department. We had not, as yet, begun to specifically examine the safety climate of the organization.

Safety Climate Survey. In 2005, a review of the literature and quality practices within the U.S. led to interest in trying to obtain baseline information about the perceived safety climate within the MUHC using a reliable and valid tool. We proceeded to evaluate the MUHC safety climate via the following methods:

- Collaborating with our patient safety coordinator and a nurse researcher, we reviewed several tools and chose the Safety Climate Survey developed by researchers at the University of Texas (Sexton, Thomas, Helmreich & Pronovost, u.d.). It was a tool recommended by both the Agency for Healthcare Research and Quality (AHRQ) and the Institute for Healthcare Improvement (IHI). Tool is in appendix 11.
- We chose one of the 5 hospitals of the MUHC to complete the survey e.g. the Montreal Neurological Hospital. This site was chosen for convenience purposes, and because several neurological units had implemented at least one BPG.
- In addition, we incorporated this measure into our first BPG research study comparing the differences pre and post implementation on the 17-implementation units versus the 14 comparisons units.

Subsequent to our early efforts, Accreditation Canada approached the MUHC to act as a pilot site for a new safety culture survey they wanted to pilot in 2007, with a view to potentially requiring such surveys as part of the ongoing accreditation reviews across Canada. They have now made a requirement that organizations undergoing accreditation processes are expected to conduct regular safety culture surveys using the modified

Patient Safety Culture in Healthcare Organizations survey with their staff -- as one means of monitoring their safety performance at the organizational level.

Other methods used to strengthen evidence-informed decision-making and improve safety practices: Knowledge exchange sessions, regular audit and reporting of results from the bedside to the Board, comprehensive communication plan, linking with educational institutions, specific adverse event and safety workshops and conferences sponsored, and supporting staff to attend many learning sessions related to safety practices.

Results

Goal 1:

Reduce falls, fall injuries, and pressure ulcers by at least 20 % by 2007 and reduce the percentage of in-patients reporting moderate to severe pain levels, through the implementation of evidenced-based best practice guidelines across the pre-hospital to post-hospitalization phases of care delivery.

Objective A Results. Implement three best practice guidelines aimed at reducing adverse events and better pain control across 5 hospitals to improve patient, practitioner and organizational outcomes. Identify and address work re-organization issues associated with strategic changes at multiple levels of the organization.

The following table illustrates key events along the pathway to establishing a program to improve safety and reduce adverse events across a large multi-hospital system.

Table 2. Overall Timeline and Key Events

2003	Commitment to new performance targets for 3 nurse-sensitive indicators
2004-05	Funding as Spotlight Org. for RNAO BPGs 3 interdisciplinary Task Forces established Prevalence surveys begin for pain & pressure ulcers
2005	Pilot testing on 11 units; ‘roll-out’ to 3 units per BPG per cycle begins Annual prevalence surveys for pain & pressure ulcers; restraints added Submitted proposal for Ministry work-reorganization funding Submitted proposal for research funding to Canadian Nurses Foundation
2006	Implementation across 18 units – 3 cycles/year Ministry work-reorganization funded - MSSS/Agence -\$200k Research study funded- CNF/RI/GRISIM - \$75k Equipment purchases for falls prevention Awarded provincial OIIQ 3M Clinical Innovation Grand Prix Publication on falls prevention, presentations, falls business case developed
2007-08	More Champion Training with RNAO Beginning work on documentation systems Falls reporting system officially changed Restraints business case developed; piloting new policies & protocols Research study #2: “Is change sustained?” - \$90k

Overall	73 implementations completed on 39 units from Sept. 2004 to Dec. 2008 Sustainability: moderately strong across most units Spread: policy changes in-progress, have better performance data, equipment has been obtained, BPG process favored as model for other organizational change initiatives. Extensive knowledge exchanges at local, national and international levels
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At the outset of the best practices program, we estimated that with a total of 45 units and 3 best practice guidelines to implement, there would be approximately 135 separate implementations. However, by early 2007 we had three years of prevalence data and could begin to see that there were many inpatient units with quite low rates of pressure ulcers, falls or unrelieved pain. The list of 45 units that required intensive BPG rollouts is shown in appendix 12.

Units with a prevalence rate consistently above the MUHC average rate clearly needed different intensity of intervention than units whose performance showed better than average rates for two of the three years. The co-directors then drafted a set of new criteria identifying “levels of need” for the 8-12 week intensive implementation, based on the unit’s prevalence rate pattern over the previous three years. Tabled for review to the BPG Steering Committee, Nursing Executive and the Council of Nurses, the decision was then made to prioritize units for future rollouts based on this pattern. That left 29 units that were prioritized for implementation during 2007-09. All but 6 of these have been completed. The group also identified the need to develop alternate “mini” intervention strategies to be used for lower risk/ prevalence areas. Testing of these began in early 2009.

During the time period since the Best Practices Program began in 2004 until December 2008, the following results have been seen:

- Annual prevalence surveys produce safety performance information
- 39/45 units (87%) have implemented at least one best practice guideline
- 28 units (62%) have implemented two or more BPGs
- 8 units (18%) have implemented all 3 BPGs
- Only 2 units still need to implement the Pressure Ulcer Prevention BPG (spring 09).
- Only 4 units still need to implement the Pain Management BPG (autumn 09)
- Some units, particularly in pediatrics and women’s health, had very low rates of these 3 indicators; they will only receive “mini implementations” starting in 2009.
- “Unit specific” profiles of prevalence rates and risk rates are now regularly provided to unit staff to increase their awareness of risk trends over time, which allows them to tailor their intervention efforts to the populations they serve.
- Over 1500 staff across 5 hospitals have received BPG training

Considerable *infrastructure support* was developed and linked to existing relevant structures/ committees to provide the essential support and facilitation needed for such a large initiative. Given there were no operational resources for any additional salaries until we obtained external grants and could hire a BPG Coordinator, we had to work with managers, clinicians, and senior leaders from several disciplines and departments across the MUHC to gain their willingness to share resources. For example, each clinical mission had several nurse educators and clinical nurse specialists; many of these expert practitioners became interested in the opportunity to experiment outside their usual territory, but usually by engaging in a task force that matched their clinical fields e.g. geriatric clinical specialists volunteered to work on the falls task force as they already had considerable knowledge and expertise in the area. These same practitioners had high “credibility ratings” within their own clinical mission where they were well known. Joining the BPG initiative increased their learning options, but also increased their workload and levels of responsibility. Had any of us realized at the outset how much work was involved, the rate of participation would have, in all certainty, been less.

From the outset, we placed a very high value on ensuring an *inter-disciplinary*

approach including clinical practice, academia and research.

- The three Task Forces (falls, pain and skin integrity) have multi-disciplinary membership, as does the Steering Committee.
- At each step of our journey, we have involved university students, practitioners, administrators and researchers from various disciplines.
- As we began our involvement with the RNAO and had staff prepared as BPG ‘champions’ we increased our multi-disciplinary approach:
 - Multiple disciplines on our research teams,
 - Multiple disciplines involved in the learning activities, and
 - iii. Multiple disciplines involved as local facilitators

Challenges faced during the pilot-testing phase allowed us to see what had to be modified before beginning full-scale “roll-out” across the 5 sites. Despite the fact that we had tried to engage managers from the outset in a voluntary manner – by asking their preferences for the timing of BPG implementations for their area --- the task force co-chairs and advocates frequently reported back to us that they were experiencing many “push-backs” as they approached unit leaders to begin the work together. Issues of short-staffing and turnover of staff were constantly impacting champions’ ability to conduct the BPG learning sessions on units e.g. sessions were cancelled and re-booked on many occasions.

Following the early pilots, the project co-directors led a series of four planning sessions (June-July 2005) prior to the full “roll-out” phase. As of early July the blueprint was completed, and it addressed many different aspects critical to sustainability and spread, including how to align future work teams to be better integrated within departmental structures/ committees. The BPG pilot results led to recommendations for changes needed within the departmental structures to better link the quality work with the appropriate committees (so form will follow function). Relationship building across the multiple work units/ sites/ missions was important to the change process. The flow of

information and knowledge was a constant struggle. There were many assumptions about flow of communication, and reality proved very challenging.

As mentioned, many examples of resistance arose from managerial levels, in particular. In order to better understand what was occurring, I and the other project co-leader held a series of meetings with the task force co-chairs and the group of nurse executives together. A major force to deal with was the constant barrage of “competing priorities/demands” on clinical units, which effectively reduced the amount of readiness and energy available to get work done. Examples included major renovation projects occurring on units at the same time that we were trying to implement BPG changes. Displacements of supplies, nursing stations, or medication rooms created a degree of chaos that was very challenging while still trying to deliver care.

In an organization of this size and complexity, it is a continual struggle for teams to have sustained efforts over time, which has enormous ramifications for sustainability of any care delivery improvements. It was clear through the discussions that while the leaders shared the same vision and priorities related to best practices and harmonization of work processes, there were multiple breaks in the system of support to and communication with middle managers. Just as in safety issues, the managers’ resistance represented only the “sharp end” of the trajectory. It became increasingly clear that some of the resistance we were seeing was related to frustrations over long unresolved broader systems issues. For example, partially broken or absent equipment increased fall risks considerably. Yet while the MUHC had an equipment repair process in place for large, expensive equipment such as MRIs and CT scanners, there was no department responsible for small equipment repairs. In fact, we often found units holding onto

partially broken chairs or commodes which needed to be removed as they were unsafe; but staff would actually retrieve such pieces from discard areas as they stated “it’s better than having no commode.”

These issues which had been already been brought to senior level attention for years, had never been resolved. The lack of clear lines of accountability caused considerable stress for frontline workers who were constantly engaged in workarounds. Subsequently much of my time was spent negotiating changes with those at the top levels of the organization who, while cognizant to some degree of the problems, had not been prepared for whatever reasons to make the necessary changes over previous years. By partnering with them to find solutions rather than to “lay blame”, constructive solutions occurred. A new “gray zone” committee was created to deal with these and many other problems that tended to fall between the proverbial cracks--- interfering with effective care delivery.

***Objective B results.** Evaluate the impact of implementation of best practice guidelines (BPGs) at the patient and practitioner levels.*

Patient Outcomes- Pressure Ulcers

During annual prevalence surveys, patients were examined for presence of pressure ulcers. Positive signs were then validated and rated by stage by the Wound Care Clinical Nurse Specialists on the survey day. Data below shows the very positive outcomes in the reduction of pressure ulcers - to well below international benchmark levels. Pressure ulcer rates have decreased by almost 50 % with the implementation of best practice guidelines. An example of the annual pressure ulcer report provided to clinical missions teams and nursing executive levels is shown in appendix 13.

Table 3. Pressure Ulcer Rates 2003-08 from Annual Prevalence Surveys

	2003 N=400	2004	2005 N=861	2006 N=798	2007 N=774	2008 N=715
% Patients with Pressure ulcer	21.3 %	BPG implementation began	14.5 %	9.5 %	11.8 %	10.9 %

Benchmark for Stage 1-4 pressure ulcers is 15-26 %

Patient Outcomes- Falls and Fall Injuries

We met the reduction target initially set by the task force, and compare very well by international benchmarks for acute care. Our fall and injury rates demonstrate that our organization is performing very well, with a fall rate that has fallen steadily over the four years since the implementations began (autumn 2005) and is well below 3 per 1,000 patient days now. There are no internationally agreed upon benchmarks, but in comparing our data with that from the VA and the NDNQI (National database of nursing quality indicators) database, we are performing well beyond most acute care organizations. More importantly, the injury rates have decreased steadily, as well (all harm categories and severe harm).

Table 4. Annual Fall and Falls Injury Incidence Rates from 2003-08.

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09*
No. Inpatient falls	1157	1146	1052	980	959	608
Inpatient falls rate (Falls/ 1,000 pt days)	3.2	3.3	3.1	2.8	2.8	2.5
Falls with Injury (Inpatient& Outpt)	34%	29%	30%	28%	26%	23%
Severe Injury Rate	1.0%	1.3%	0.9%	0.95%	0.86%	0.5%

* Periods 1-9 out of 13 available

BPG implementation

Patient Outcomes- Reducing Moderate to Severe Pain

The trend data reveals that, until this year, there have been steady increases in the percentage of patients experiencing pain and at moderate to severe levels; in 2008, there was a first-time decrease of 4.6% (not tested for statistical significance). The benchmark for moderate to severe pain is 58-68%; we outperform this. The target of 50% reduction in patients experiencing moderate to severe levels of pain set by the Pain Task Force was far from being met. In retrospect, it is clear that this goal was overly ambitious. Future efforts will be focused on sub-populations of patients in order to more carefully examine the specific contextual factors and identify more targeted interventions.

Table 5. Prevalence Rates of Pain and Pain Levels from 2004-08

	2004 N=704	2005 N=789	2006 N=745	2007 N=664	2008 N=613
No pain at this time	57.2 %	55.3 %	49.4 %	45.7 %	46.3 %
% Patients with pain 4	25.7 %	27.5 %	36.6 %	36.2 %	31.6 %

BPG implementation

Practitioner Outcomes

Practitioner outcomes were measured in the following ways:

- a) Focus group feedback during implementation process on each unit;
- b) During the CNF-funded study 1, *BPG Implementation: Does Changing Nursing Practice Improve Patient Outcomes*, and the second study entitled *The influence of context, facilitation and evidence on sustained change in nursing practice following implementation of best-practice guidelines*

Focus Group Feedback. These sessions were held throughout each unit's 8-12 week implementation period. As well, focus groups were conducted as part of the research studies, and underwent thematic analysis. The frequency of some of the comments across many units/sites indicated that new patterns of work re-organization were emerging of comments reflect changes that became evident. The key points are summarized below:

- Work re-organization: staff was now making less referrals to the Wound Care specialists as their own knowledge and skills in assessing pressure ulcers had improved. They expressed confidence about knowing how to manage more of the care themselves.
- Staff frequently commented that the BPG process had given everyone a “common language” and lexicon of terms making it easier to have conversations within and across disciplines e.g. with physicians and rehab therapists.
- Teamwork & Communication: many expressed positive comments about how they were working better as a team because of increased communication about these safety issues. They described improved levels of communication not only between nurses, but also between nurses and patient attendants and with the interdisciplinary team. The fact that the BPG learning sessions had been designed and delivered within an interdisciplinary framework appears to have achieved its goals, at least in part – based on this feedback.
- Workflow & Hand-Offs: Some noted that transferring of cases between units is easier now, as many nurses are more routinely exchanging important information related to fall and pressure ulcer risk – and again, the notion of a common language was seen as valuable.
- Interdisciplinary de-briefings occurred with varying consistency after falls, and staff indicated they were much more aware of the interventions that needed to be modified by carefully reviewing what happened.
- Nurses expressed confidence in their learning about risk factors, as expressed by such statements as “I feel they have become automatic now” (which interventions to use).
- It was recommended that the Morse score be added to the routine information provided during report. This illustrates some of the routinization starting to be embedded.
- The pre-implementation meetings on each unit with the task force co-chairs and leadership staff provided important times for engagement, clarification, and opportunities to explore what the expectations of the unit leadership team were
- BPGs are perceived as relatively easy to learn and have some added value, as long as they do not increase workload (particularly documentation).
- Documentation Issues: One of the most salient and persistent findings was the lack of consistent charting about care provided. Staff expressed many negative comments about the lack of unified charts across sites, and the amount of time it takes to document care. There were many comments about the perceived increased burden to chart more things with the introduction of BPGs. On the other hand, other staff commented that having Morse and Braden risk information allowed them to be more focused on their individual patient’s priorities.
- Workload and documentation: The most frequently heard comments in focus groups were about the heavy workload and competing priorities. Some RNs felt that there were too many new procedures and practices changes being introduced simultaneously e.g. hypoglycemia protocols, new opioid protocols, etc. Others felt quite stressed by the workload on their units (and fatigue related to high rates of overtime) – and indicated that they don’t have time to both provide care and chart it, so they often “do not take the time to write down what I’ve done”.

- Many staff felt their own care practices have improved related to pain management and falls and pressure ulcer prevention.
- Facilitation provided by the co-chairs and Advocates was seen as supportive to the unit-based teams. The champions took on their new roles with considerable energy and demonstrated important leadership, coaching, and troubleshooting; they provided frequent reminders to nurses and patient attendants.

Changes in Nurse' Practice. Our first research study was a non-equivalent control group pre-test and post-test design. The sample included 17 implementation units and 14 comparison units. Units were matched on the basis of the 2005 prevalence rates (pressure ulcers and pain) or the falls rates. It included 1,807 patients and 1,306 nurses. Measures included: chart reviews at baseline and 6 months after the end of the implementation period for a given unit. In the second study, we examined the sustainability of practice changes at 18 months post implementation. The target chosen as an indicator of successful practice change was 10 % as per the Grimshaw work (2004).

Each best practice guideline contained anywhere from 2-5 practice indicators, and these were the focus of measurement at baseline (time 1) to 6 months (time 2) and 18 months (time 3) post-implementation. Each of the practice indicators is shown on the tables below. Units were further classified as either having had a:

- High rate of practice improvement (there was at least a 10 % improvement in all or most of the indicators)
- Moderate rate of practice improvement (there was at least a 10 % improvement in half of the indicators)
- Low/ no rate of improvement (1/4 or none of the indicators showed at least a 10 % improvement)

Table 6. Research Results: Practice Improvement Changes for Pressure Ulcer Prevention

5 Practice Indicators	4 Comparison Units at 6 Months	6 Implementation Units at 6 months	Intervention Units at 18 months
Skin assessment on admission	35 to 40 %	27 to 43 % **	Held gain at 42 %
Braden done w/in 24 hours	1 to 4 %	4 to 36 % *	Held gain at 36 %
Braden q 48 hours	0 to 0	0 to 12 % **	Further gain to 18%
Braden q week as needed (LTC)	0 to 2 %	0 to 38 % **	Less gain at 26 %
Skin assessment documented in last 24 hrs	26 to 41 %	31 to 43 % *	Held gain at 37 %

- Statistical significance levels: ** represents p .01; * represents p .05
- All implementation units showed at least a 10% improvement on all practice indicators
- Comparison units (1 of the 4) showed a 10% gain in skin assessment in last 24 hrs
- At 18 months, the implementation units held their gains quite well, except for doing the Braden q 48 hours; nonetheless their rate at 18 months was still over a 10 % improvement from baseline.

Table 7. Research Results: Practice Improvement Changes for Fall Prevention

2 Practice Indicators	4 Comparison Units at 6 Months	6 Implementation Units at 6 months	Intervention Units at 18 months
Morse Risk Screening on admission	14 to 16 %	1 to 24 % **	Further gain to 38 %
CATT Tool completed on admission & post-fall	0 to 1 %	0 to 19 % **	Further gain to 82 %

Methodological change prevented accurate comparison at 6 months. Counting error.

- Statistical significance levels: ** represents p .01
- All implementation units showed at least a 10% improvement on both practice indicators
- Comparison units did not show improvements at the 10% rate

Table 8. Research Results: Practice Improvement Changes for Pain Management

4 Practice Indicators	5 Comparison Units at 6 Months	6 Implementation Units at 6 months	6 Intervention Units at 18 months
Pain rating q 12 hours	7 to 9 %	14 to 29 % **	Further gain to 43%
Interventions documented q 12 hours	24 to 21 %	42 to 27 % **	Further gain to 42%
Reassessment after intervention	15 to 19 %	20 to 30 % *	Held gain at 30 %
Pain rating present on Vital sign sheets (specific location)	9 to 16 %	5 to 31 % **	Further gain to 44 %

- Statistical significance levels: ** represents p .01; * represents p .05
- Implementation units showed at least a 10% improvement on 3 of the 4 practice indicators. Performance worsened with interventions documented q 12 hours, but at 18 months went back to baseline rate, which was higher than comparison units.
- Comparison units did not show improvements at the 10% rate

Summary points from the research indicate:

- There was moderate-to-high levels of practice change on 15/17 of the implementation units as per documentation on the patient chart
- Nurses on the highest change implementation units had higher perceptions of safety climate and organizational support (study 1)
- While these results are generally positive in terms of practice improvements shown, it is also clear that there is still considerable room for improvement as the levels of performance still remain below 50 % for all but one indicator.

Staff involvement in falls risk assessment tool development. The falls task force designed a tool to provide an easy way for nurses to identify and chart fall interventions that linked to the individual risk factors. During the pilot implementations, feedback indicated it was seen as far too time consuming and detailed by all practitioners. On one site, this response was so strong and rapid that the Falls TF co-chairs had to respond to an urgent meeting request. The nurse manager saw little value in this tool, and suggested a different one. Skill development in diplomacy and negotiation were honed through these experiences. The revised tool now known as the CATT Tool was modified based on staff

feedback and re-piloted with excellent outcomes. The acronym CATT stands for the key times of when to perform a detailed falls risk assessment for patients whose Morse risk screen score was ≥ 45 e.g. Change in status, Admission, after a Transfer and after a Tumble (Appendix 14).

Feedback regarding use of the Morse Falls Tool: While staff found the Morse easy to complete, there was variability in scoring during training sessions pointing to need for more practice. Staff recommended we add short descriptors for the risk factors, as not all were clear about the definitions. It was usually completed at time of admission and after a fall, but on busy acute care units doing a Morse with changes in patient status (as per the guideline) was seen as nearly impossible by staff. This correlates with nurses' perceptions of a high patient load, in the survey results. Valid questions arose from the long-term care unit staff questioning the value of repeating a Morse assessment when indeed every patient scored at high fall risk, and with their long-term residents this was not likely to change. These discussions allowed important opportunities for knowledge exchange about the need to then focus more on the individualized risk factor assessment and intervention strategies. Several nurses commented on how hearing a high (Morse) score at report now really "catches my attention" and "makes me go see the patient earlier" at the start of the shift.

***Objective C.** Improve the corporate administrative monitoring systems related to adverse event reporting to streamline processes at the care delivery level and for better performance management at the mid-management, executive and Board levels.*

The MUHC Falls Task Force reviewed multiple sources of evidence (literature, expert opinion) to develop a more appropriate method of reporting falls and fall injuries that would allow not only internal comparisons, but also external benchmarking with other performers in the U.S. and Canada. A definition of falls was adopted, and I prepared the new statistical reporting methods for rate (falls per 1,000 patient days) and severity. I simplified the Institute for Safe Medication Practice's injury severity categories to "falls with no harm" (categories A-D), "falls with harm" (categories E-I) and "falls with severe harm". Organizational data was then converted manually and used for monitoring by the Falls Task Force. I retrospectively adjusted 2003 data as well so that the Falls task force would be able to accurately measure change over time as a result of the BPG implementation. Similar rate conversions were then completed for all in-patient units. This system became operational in 2005, and reports to the Board were adjusted by 2007.

Consultations held with frontline managers, clinical leaders, and members of the Falls Task Force indicated that the usual quarterly reports provided by Quality to MUHC managers (based on provincial Incident Report data) were of little value. These reports were long and yielded only very general frequency data. While more specific profile information was obtainable on special request from the Quality department, actual awareness of this was found to be limited. Given that timely and valuable information about adverse events and incidents is a necessary precursor to improvement activities, in 2005 I created a small sub-committee composed of a manager, Falls TF co-chair, and representatives of the Quality department, to examine how this work process could be

improved. The result of that yearlong consultation is the new MUHC Falls Report now in use (appendix 15).

A second goal was to develop an electronic Post Falls De-briefing tool that would provide details linking process measures (care interventions) and the fall risk profile of the patient. That tool was completed in 2008 in consultation with several nurse managers from high fall areas, was then piloted tested with 5 units and is now ready to “go live” across sites this year (appendix 16). Its implementation will now allow for systematic managerial safety evaluation processes across the organization--- in other words, it is another means of improving system reliability. The importance of persons in senior leadership roles really listening to the issues encountered at the clinical interface cannot be emphasized enough, and assisting by facilitating the critical conversations between departments. The new monitoring and reporting tools developed through this type of collaborative process have considerably more value.

As well, we initiated a number of meetings with the MUHC Risk Manager to discuss these issues around reporting, and to examine ways to strengthen the overall system.

During these sessions, other important issues were further identified:

- Many incident report forms are incomplete when sent to Quality, and because these one page forms are meant for reporting all types of adverse events the space for tracking falls and fall injuries is very small.
- Another barrier to more effective monitoring and accountability is the limited information systems infrastructure within the organization.
- Another gap identified after the introduction of our best practices program was the fact that a number of key groups responsible for quality improvement, such as the Council of Nurses Quality Committee, the Council of Physicians, and Multidisciplinary Councils were not receiving any of the incident report data. We recommended much better linkages were needed with these clinical leadership groups. Subsequently, representatives of each these groups were invited to become members of the newly commissioned MUHC Patient Safety Committee.

A provincial review of the current adverse event reporting process began in Quebec in 2006. Via direct membership on this work group, the MUHC Falls task force was able to influence to some degree the method of reporting falls, by introducing our prototype for consideration. However, the exceedingly slow pace of the provincial changes (still not introduced as of March 2009) led the Falls task force to continue its push for adoption of new improved falls measures.

Goal 2 Results

Develop a stronger culture of safety and evidence-informed decision-making by increasing “organizational readiness” regarding the impact of adverse events, and linking the organization’s performance directly to safety outcomes.

Objective A. Evaluate the impact of implementation of best practice guidelines (BPGs) at the organizational (system) level.

Impacts of the BPGs on Organizational Climate

During Pilot Phase of BPG Implementation. All nursing staff on the 11 pilot units was surveyed for their perceptions of the BPG program. Staff Perceptions of: worth of the BPGs, receptivity to organizational change, organizational support for BPG implementation, and educational & facilitation support received. Summary points include:

- Perceived worth of the BPGs and likelihood of continued use were rated quite high (8 on 10 point scale)
- Perceived changes that had occurred in practice due to the BPG use was moderate (6-7 on 10 point scale))
- Organizational support for BPGs: moderate scores (2.7-3.2 on 4 point scale). High scores occurred for: sense that fellow nurses were open to try new things, feeling of “let’s get things done”, and my manager is an advocate for nurses.

During Roll-out: Survey of Staff Perceptions of Organizational Support for BPG

Implementation. Bedside nurses on the 31 study units (Study 1 and 2) were asked to complete the survey on perceived organizational support for BPG implementation. It includes the following items that were then rated on a 1-4 likert scale: we had adequate numbers of qualified staff to implement the BPGs, nurses were given sufficient time and training to learn how to use the BPGs; we had the equipment and supplies needed to implement the BPGs; nurses have readily adopted changes required to implement the BPGs; top management has support staff to implement the best practice guidelines. Appendix 17 provides an example of the results reports on this data. In that report you can see the mean organizational support scores and safety climate scores for all comparison and implementation units, in the last table of the page.

The following table shows the results of the mean score for perceived organizational support relative to units with low, moderate and high rates of practice change.

Table 9. Research Results: Perceived Organizational Support for BPG Implementation

	Low or No Practice Changes	Moderate Practice Changes	High Practice Changes	F (df) score	P value
Mean Organizational Support score	2.61	2.67	2.94	7.518	0.001

- High practice change units scored significantly higher than either the moderate or low practice change units.

We held meetings with frontline staff and the leadership team at regular intervals during the research studies between 2006-09 to share the findings about their specific units, and to seek their feedback about the progress, challenges, and their suggestions for

how to improve the program further. By design, we asked the senior nursing executive for that given clinical mission to participate in these meetings. Very positive feedback was received from staff about this person’s attendance; often, they commented, that they don’t get enough opportunities to really talk with these leaders. This strategy was used as part of ongoing efforts to link the frontline with senior decision-makers – to bridge the gaps and ensure a more integrated approach to these safety issues.

Survey of Staff Perceptions of Safety Climate

Sexton’s Safety Climate tool was used as described in the methods section. The survey is a 19-item likert-type questionnaire, to which we added one open-ended question (comments/ suggestions). The Safety Climate Mean is calculated by the responses to a subset of seven key questions within the survey. These questions are 1, 2, 3, 8, 9, 10, and 11. Each question is scored on a five-point scale. A positive safety climate is defined as a Safety Climate Mean of 4 or greater. Overall the safety climate was higher on units with the greatest degrees of practice change. This difference was significantly different on the units with highest success in practice change compared to the units with only moderate success. The nurses from the units with the lowest levels of success in practice change were not different from the other units. The table below shows the mean safety score, as well as the overall safety climate score out of 100.

Table 10. Research Results: Perceived Safety Climate on Study Units

	Low or No Practice Changes	Moderate Practice Changes	High Practice Changes	F (df) score	P value
Patient safety total mean (1-5)	3.95	3.92	4.18	5.457	.005
Safety Climate overall score (100)	73.74	73.0001	79.6	5.457	.005

Environmental & Equipment Safety Audits of the 5 Sites

A key evidenced-informed intervention to reduce falls and fall injuries is to ensure a safe physical environment. Some of the common hazards in our acute care settings included: portable IV poles (trip hazard), catheters and other devices attached to a patient's body, uneven levels of lighting especially at night, crowded and small multi-patient rooms, equipment such as wheelchairs or commodes whose wheels do not lock correctly, and beds that are too high even in their lowest position to ensure that "the first step is a safe step". Because of these risks the Falls task force took on the role of conducting an environmental and equipment scan of all inpatient areas, and prepared a report that I was then able to use in building the business case for fall prevention resources.

Environmental and equipment audits conducted on all units of the 5 sites revealed:

- Many pieces of faulty equipment (commodes, wheelchairs, bedrails) and patient furniture (chairs) that posed fall hazards

- Loose tiles on flooring, call bells out of reach particularly when patients were sitting in bedside chairs.

- Lack of safety footwear/ socks for long-term care residents

- Clutter inside patient rooms from the patient's own personal belongings was common problem. Staff worked with patients to help them understand the need for clear passageways, particularly at room entrances and pathways to the bathroom but for the cognitively impaired such education had little value.

- Space limitations e.g. space around beds, narrow passageways inside most bedrooms at both sites, added to the risk for falls.

- A significant lack of appropriate fall risk reduction equipment such as bedrail bumper pads, wedge cushions for the foot of the bed, alarm systems for beds and chairs that ring when a patient is attempting to exit. These devices are very useful for many elderly patients (slower moving or cognitively impaired) as it eliminates the need for restraint use.

- Feedback from staff and managers that these resources are essential yet unavailable, and they hoped the Falls TF would be able to assist in lobbying for their needs.

- A variety of work-arounds had been created by staff to compensate for the inadequacies of equipment-

Safety Environmental & Equipment Evaluations of Two Emergency Departments

Comprehensive evaluations of the physical environment and equipment of the two adult emergency departments of the MUHC revealed some significant safety and fall risk issues.

At both campuses, the common problem was the height of stretchers. While there were different styles/ manufacturers, the overall height of the stretchers and the fact that almost all were positioned in the highest positions poses quite significant risks for patients.

Add to that the fact that very few had the appropriate Velcro strap to hold the mattresses in place, nor had footrests and the combination results in patients potentially slipping off the end of the stretchers along with their mattresses (this was observed).

Adjustment pedals also were difficult to access depending on the placement of the stretchers.

At the RVH, the lack of any call-bells for corridor patients and the fact that so few commodes were available (and access to the 2 bathrooms was poor) not only increased the likelihood of patients trying to exit stretchers on their own, from high off the ground, and falling.

At both campuses, lighting issues (both too much or too little) were identified, A very high proportion of the commodes and wheel chairs were broken, or had missing / faulty brakes.

These deficiencies were addressed by: a) obtaining new stretchers and portable commodes that better met the specific safety needs; b) discussions with staff about work organization, particularly about the positioning of stretcher height (maintaining them in lowest possible position; c) ensuring technical services made the lighting repairs.

Outcomes. The result of these comprehensive audits demonstrated a significant corporate problem --- lack of proper safety equipment in both the EDs and across the 5 sites. I then requested meetings with colleagues in senior administration, and in particular the Associate Director responsible for Corporate Equipment purchasing, to table the business plan explained in the next section. The outcome was agreement to set aside funds over the next 3 years to make all the necessary purchases for falls prevention

equipment (nearly completed), and to accelerate the bed replacement plan for the entire organization (one site is completed; others are partially completed).

The Falls TF also strategically positioned itself to provide guidance on the product choice for new beds so that we could ensure designs are chosen that maximally reduce the risk of falls, injuries to nurses and patient attendants. Key features include: beds that go as low as possible and are within the control of patients, built in scales (to reduce the number of unnecessary transfers), built in movement/ exiting alarms). It was interesting to learn in my communications with the VA system that these types of basic commitments to patient and staff health are universally applied, with full corporate buy-in. It serves as an excellent example of how leading at the top should occur, based on the learned lessons from the aviation and nuclear energy agencies.

***Objective B.** Develop a business case for falls safety by evaluating the corporate resources needed to improve safety practices and the potential cost avoidance by taking preventive action.*

One of the most important lessons learned during this best practices program has been becoming more skilled at translating nursing's needs to those who ultimately control the purse strings (finance) and the Board of Directors. The key in our case was to talk to them in a (financial) language they understood more easily than a clinical one. By this, I mean that for years our nursing department had been complaining about not having enough equipment for practitioners to deliver basic care --- yet we were largely unsuccessful in getting what was needed to solve this problem. Every several years, nursing would be designated a priority area --- but the lack of a consistent approach to funding that acknowledged the need for continuous infusions of funds to cover ongoing

replacements and repairs ultimately resulted in a steady decline in effectiveness and a parallel rise in frustration.

Within a year of beginning its work, the Falls task force had completed comprehensive audits that made it abundantly clear that best practices roll-out could not occur without investments in better beds and fall prevention equipment such as: bed and chair as alarm devices, non-skid socks for patients without footwear, long call bells for patients sitting in chairs at the bedside, bumper pads and floor mats to protect frequent fallers. From the audits, I prepared a spreadsheet of expenditures required for all sites, which totaled \$143,000 (or approx. 3,200/unit).

Presenting the business case for falls prevention essentially involved demonstrating that what we were spending in maintaining the status quo actually cost more than making some investments to reduce injuries. This was compelling information to both Finance and the Board Quality committee, partly due to the cost avoidance opportunity and also because I came prepared with an alternate solution that was evidence-informed and systematically acquired within the MUHC. Keeping the Board of Directors' Quality committee up-to-date with our initiative via annual formal face-to-face reports was strategic and extremely useful. They championed our case to the various foundations and internally put pressure on the executive team to ensure our prevention practices could be put into effect to reduce harm to patients. Some fall-related costs included:

- According to Bates' study, injurious falls represent a 12 day length of stay
- In a VA study, hip fracture fall injuries had an average cost of \$ 34,000 (U.S. VA data), and result in increased length-of-stay of 17 days, on average
- Assuming approximately 11 MUHC hip fractures / year based on rates in 2003, this represents an annual cost of approx. \$ 374,000, and 187 wasted bed days.
- In 2003, the MUHC fall rate was 1,100 falls, with 34 % of these falls resulting in injury = 378 injured fallers / year.

- Assuming at least half of these falls were preventable, this would account for 2,270 bed days potentially available for other admissions.
- MUHC average settlement cost for 15 serious falls in 2001-04 = \$4.6 M (\$306 K)

Contrast this with the estimated cost of fall safety equipment costs of approximately \$143,000, and it becomes clear that the preventable costs associated with one year of fall injuries exceeds the cost to properly outfit all care units. As shown above, the settlement costs for fall injuries at the MUHC were also significant. As well, there are even more important savings to be had vis-à-vis patient days if adverse events such as fall injuries were reduced (improving access for other care).

Expenditures in maintaining status quo = Annual cost of \$374,000/yr
Versus
 Costs for safe environment = \$143 K fall prevention equipment

As of 2008, we had obtained \$120,000 towards fall prevention device purchases, and much of the targeted \$5M for new beds. This first success in building the business case for patient safety was followed by the development of two other business cases: a) one for restraint usage (completed and piloting of new equipment is in-progress); and b) one for pressure ulcer prevention- for turning and positioning equipment, and waffle mattress overlays.

Objective C. Obtain funding for the BPG Implementation Program to support sustainability and spread.

After the initial joy of receiving funding of \$100,000 as a National Spotlight Organization for BPG implementation, it soon became apparent that those funds would not go far. Within a year, we realized more funds would be needed to pay: for release

time for staff to attend BPG learning sessions, to send task force members to additional specialty conferences to acquire more expertise or to present their own work, and to support someone who could devote time to the overall coordination of work done by the BPG Steering committee and three task forces. The funds obtained from the Ministry and the research grants were particularly helpful in sustaining the full-time coordinator.

Total funds acquired to-date = \$ 1,605,000

- \$ 100K Awarded RNAO National Spotlight status
- \$ 200K Successfully applied for work re-organization grant with Ministry of Health
- \$ 75K First research grant from Canadian Nurses Foundation, MUHC Research Institute and GRISIM
- \$ 90K Second research grant from Canadian Nurses Foundation, MUHC Research Institute and Newton Foundation
- \$ 120K for point of care falls equipment
- \$ 20K MUHC Innovation Bursary awarded by the CEO for a project to increase public awareness of falls prevention measures
- \$ 1M beds and patient furniture replacement

The funds from the Ministry of Quebec were obtained via a competitive process for organizations wishing to make large-scale changes in work re-organization. Having submitted the BPG initiative, we were successful in receiving \$200K. These funds were used primarily to fund the BPG coordinator position (\$84,000), release time for staff to attend learning sessions (\$104,000), and approx. \$12,000 to cover supply costs associated with the project and to partially cover expenses for a workshop offered to hospitals in the Montreal region on developing best practice champions. These resources played an essential role in sustainability of the project.

Another source of capital (intellectual) has been from the strategic and deliberate use of graduate students from McGill University and two doctoral students from other

universities -- who agreed to complete some of their course requirements by working on patient safety projects to reduce adverse events (medication safety, different strategies to increase falls prevention awareness amongst clinicians).

Objective D. Strengthen the Safety Culture of the Organization.

Safety Climate Survey Conducted at Montreal Neurological Hospital

The Safety Climate Survey (Sexton et al., u.d.) was piloted in fall 2005 with all of the staff of the Neuroscience Mission of the MUHC. The response rate was 45 % (223/ 496) and a variety of targeted strategies were needed to achieve this rate. Groups with greater than 80 % response rate were: administration/ managers, rehab therapists, and physicians.

Out of a maximum score of 5.00, the Safety Climate Mean was 3.88. The percent respondents viewing safety climate as positive was 53 percent. The Safety Climate Score was relatively similar (range 3.82-3.93) regardless of their *experience in their position*. Staff with less than one year and those with over 21 years of *overall* experience gave the highest ratings (>4), and there were minimal differences based on age. Rehabilitation staff, CSR staff and managers tended to rate the safety climate higher than nurses, social workers, physicians, and clerical and technical support staff – but overall the differences by profession/ role were relatively small.

The highest rated items were related to the importance of safety briefings at the beginning of a shift (question 12, average score = 4.37) and that personnel within their department take responsibility for patient safety (question 17, average score=4.23). Despite the high scores for the importance of a safety briefing the score as to whether or not a safety briefing was part of the regular practice was 3.43 (question 15). While personnel responded that they took responsibility for patient safety, the response to the

statement that the institution was doing more now for patient safety than it did two years ago was the lowest score at 3.43. The open-ended question yielded information about perceived deficits as well as suggestions for improvement. Most common statements related to: (a) culture (blaming, respect, incentives/ positive feedback, disconnect between senior administration and frontline realities); (b) system inefficiencies and lack of equipment; (c) knowledge transfer/ training; (d) communication issues, and (e) staffing shortages.

Other Interventions to Strengthen Culture of Safety & Increase Evidence-informed Decision-making.

Leadership Development. An important outcome of the overall project has been the significant leadership competency development that has occurred with persons engaged in the initiative. This was particularly true of the Advocates and task force co-chairs, who were suddenly catapulted into roles that required that they develop many new relationships across sites they had never worked at, and with teams and individuals with whom they didn't have "established credit ratings". Lacking the positional authority that they had in their own clinical missions, they needed to be nimble, flexible and yet convincing as they met one obstacle after the next. Some of the leadership competencies that were further developed includes the following:

- Capacity to motivate others towards changes
- Communication skills – particularly listening and verbal communication
- Political awareness and public relations
- Facilitation and guidance without taking over
- Project management skills
- Flexibility and negotiation skills
- Knowledge transfer

Extensive Knowledge Exchange. There were extensive learning exchanges that occurred throughout this project, and at all levels of the organization e.g. regular reports to: the Board, senior administrative committees, work teams, unit staff, nursing executive levels and middle manager ranks, interdisciplinary safety forums, quality committees at various levels of the organization, etc. While it is difficult to assess the impact of the wide range of approaches used, the attendance at the special safety lectures, workshops, and conferences was excellent, suggesting there are many persons interested in learning more about these issues. A list of external presentations related to our best practices program is in appendix 19.

Spread to Other BPGs. An indicator of the success of the best practices program has been the degree of spread to implementation of other BPGs (RNAOs and others). It demonstrates the organizational momentum that has built up over the last 5 years. All are focused on quality or safety improvements for important populations that the MUHC serves.

- **Adult Asthma Care Guidelines for Nurses: Promoting Control of Asthma:** Used as part of basis for new program at the Montreal Chest Institute in combination with the Smoking Cessation guideline.
- **Nursing Care of Dyspnea: The 6th Vital Sign in Individuals with Chronic Obstructive Pulmonary Disease:** Implemented at the Montreal Chest Institute in combination with the Smoking Cessation guideline.
- **Care giving Strategies for Older Adults with Delirium, Dementia, and Depression & Screening for Delirium, Dementia and Depression in Older Adults:** Used as part of basis for new policy and education program re restraints.
- **Assessment and Device Selection for Vascular Access & Care and Maintenance to Reduce Vascular Access Complications:** Used as one source of evidence in committee meetings to set new procedure and harmonize across sites.
- **Canadian Stroke Guidelines:** Implemented across all adult sites of the MUHC, and under the MUHC's leadership we have developed a region-wide Stroke Network Steering Committee focused on best care over the continuum.
- **End of Life Care:** during 2007-08 I co-led this initiative focused on implementing evidence-based end of life care, across 3 of our ICUs. This was the first collaboration of the MUHC in the joint CPSI- Canadian ICU Collaborative

End of Life Care national Collaborative. We just presented our improvement work at the International Palliative Care conference (Sept. 2008) and won first prize in the poster contest.

- **Healthy Work Environment:** Used as a basis for MUHC Nursing Summit in October 2007 (Healthy Workplaces... Within our Grasp?). All the RNAO Healthy Work Environment guidelines are incorporated in the recommendations for implementing an action plan at unit, mission and departmental level. This will take place over the next 12-24 months. I solicited corporate funds to send 2 persons – a nurse Manager and an assistant nurse manager – to the RNAO Summer Institute on Health Workplace Guidelines in August 2007.
- **Restraint Use:** I am a senior leader on the MUHC Restraints policy and protocol development and implementation committee led by a clinical nurse specialist. This group has been involved in facilitating role re-organizations across the following departments using LEAN work processes in order to successfully implement this protocol (laundry, housekeeping, stores, nursing, and finance).

Other Organization-level Impacts

Our involvement in furthering a safety agenda has been multi-level and across a broad range of safety and quality issues. Some of the activities include:

- Created a large cohort of safety experts/champions: the span of individuals has been very large when one takes into the account the members of the task forces (60+), advocates (15), co-chairs (10), and unit-based champions (over 300 staff). Harmonization of practices (restraints and demand for BPG implementation model replication) – via EXTRA program that now includes a team
- *e* Documentation: Now developing the electronic version of the safety risk screening tools for the MUHC clinical information system (CIS). Our aim is to streamline documentation processes with the new CIS, as this was a major obstacle all throughout this initiative.
- Request in January 2009 from our newest 6th hospital site (Lachine Hospital) to introduce best practices program aimed at reducing adverse events
- Introduced regular feedback & performance reporting on these parameters, which has led to other departments becoming more results & performance-oriented in their work. See appendix 18 for example of Annual Report on BPG work.
- Expanded research program focused on reducing adverse events: since the start of our BPG program it has attracted the attention of two doctoral students who also wished to conduct programs of research in the patient safety area (A. Biron, C. Covell) e.g. medication reconciliation & nurses report of medication errors. I have also been invited to participate as a co-investigator in three other research studies since 2004, given my interest in patient safety. These studies are in turn increasing the MUHC's profile in the area of patient safety innovations.
- Innovation Bursary: Through annual funds awarded by the CEO, I was successful in obtaining \$20K to develop a public campaign to increase awareness of falls

risks all throughout the hospital (not just clinical areas). Held a poster contest that engaged visitors, volunteers, patients and staff. These posters are now highly visible across all sites, and other falls prevention groups across Canada have asked to use our posters.

- Established commitment with unions to use provincially-allocated funds to send different teams for training in best practices
- Knowledge exchange sessions with clinicians, researchers and management (mid and executive levels). These focused on specific adverse events, falls and other safety issues. Dr. Nancy Edwards met with members of the TF and others on four occasions.
- Co-planned a public safety lecture with Ross Baker as the guest speaker, addressing Patient Safety and High Reliability Organizations. Included lobbying for the funds.
- At senior level nursing executive forums regularly reinforced the need to be evidence-based in as many decisions as possible (safety issues, budgeting decisions, quality monitoring, program development planning).
- Developing skills in root causes analysis in de-briefing sessions for sentinel events. I assisted in conducting several of these sessions with the guidance of the Quality department.
- Became a member of the relatively new MUHC Patient Safety Committee where policy and priorities are shaped. Served as link between the work of the best practice guidelines program. This safety committee accepted the recommendation of the Falls TF that a member of the TF participate in all fall sentinel event de-briefing sessions.
- Harmonization of practices (restraints) and demand for BPG implementation model replication) – via EXTRA program that now includes a team
- Falls SE de-briefings (focusing on need for more reliability in practices, better equipment) and ED initiative

Communication Strategies to Keep Focus on Patient Safety Agenda. Regular

communication aimed at multiple levels of the organization has been occurring to

increase awareness of the BPG project and reduction of adverse events, provide regular

updates of progress and to ensure broad stakeholder engagement. Interventions included:

- Annually, Dr. Ritchie and I present the results of the best practices program to the MUHC Board of Directors Committee on Quality and Risk. The Board specifically requested receiving the business case developed for falls prevention, and I have successfully used this forum to lobby for funds particularly for bedside safety equipment from the Board and our Foundations,
- BPGs been a standing item on the monthly agendas of all clinical mission nursing leadership agendas, as well as those of the Council of Nurses Executive committee and the MUHC Nursing Executive committee for the last 5 years---

- evidence of routinization of safety priorities for continuous review by senior administration.
- Regular columns on BPG results to-date appeared in the Council of Nurses Bulletin and the CEO's electronic weekly newsletters (e En Bref)
 - Regular presentations at the unit-level and the organizational level on BPG outcomes e.g. during Patient safety Week

Regional/ Provincial level.

- In 2006, we were awarded the provincial 3M Innovation Award by the Order of Nurses of Quebec for our success in improving patient outcomes, nursing practice and organizational culture for patient safety. This was awarded jointly to the MUHC and Charles LeMoynes Hospital for our collaborations and improved outcomes.
- Have provided input to development of new provincial incident reporting tool via a member of the Falls task force. This has been a very long process to influence falls reporting at the provincial levels.
- 2 BPG leaders are now members of the RNAO review panels for development of pain and falls prevention BPGs
- Provided training workshop for regional hospitals in 2007, and we continue to provide consultation support to other centers across the province.

National level.

- MUHC has had 5 EXTRA fellows in the first 5 years, including first team chosen. I was the first Fellow and have supported the other candidates throughout their fellowships. There have been very deliberate efforts to maximize the number of persons who will be trained through this program that focuses on strengthening evidence-informed administrative and policy decision-making.
- I was invited as a faculty member to the Canadian Patient Safety Institute's National Falls Collaborative (2008-09). This has created the opportunity to set the indicators for falls prevention with an impact and "reach" across the country. Because I had been working extensively in falls prevention by the time this group was being convened, I have been able to share and exchange with other faculty and the participants from the 31 long-term care facilities who are part of this National Collaborative.
- Increased invitations to participate in multi-jurisdictional research on introduction of safety practices in acute care and home care. Currently a co-investigator on a CIHR funded study on medication safety practices in home care (Primary Investigator is Ariella Lang)
- Participated in safety policy development forums: with the Canadian Patient Safety Institute/ CHSRF, and nursing workload national invitational meetings with multiple stakeholder groups.

International level.

- Was invited to attend the annual strategic planning meeting for falls safety planning with VISN 8 in South Florida. I continue to collaborate with VISN 8 VA in South Florida (Patricia Quigley).
- Have been invited as plenary speaker and guest faculty member in Virginia, Texas and Philadelphia to share results of our BPG work.
- Publications by Dr. Ritchie and me on patient safety during the last 5 years have the potential to influence a much larger audience than just my organization. With the falls article publication, I have received correspondence from individuals in several locations seeking assistance in their own falls prevention work (Spain, U.S., several Canadian provinces)
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Discussion & Conclusions

Engagement of Executive Levels

Patient safety is both a moral imperative and a financial one. The overall costs of injurious falls are expected to rise dramatically given the aging trend. Developing a culture of safety means safety must truly be a top priority of an organization. In our organization, there was a gap between the values for safety at strategic / corporate level and operationalization to the frontline. One way this was evident was the serious lack of resources for basic safety and fall prevention care, thus serving as a barrier to practice change. As a senior leader in the organization, I was determined that we develop a systematic and comprehensive evidence-informed approach to closing this gap. The successes we have seen have been in part a function of ensuring there were senior administrative leaders co-leading the initiative – as I was able to act as a credible go-between between executive offices and the frontline and the task forces, and Dr. Ritchie was able to easily navigate the external funding routes for funding support to accelerate the BPG program work.

Infrastructure, Financing & Role of Champions

As described in the PARIHS framework, important features of support when initiating large scale practice changes across multiple hospitals include: aligning changes with strategic goals, ensuring role clarity, adequate resources, effective organizational structures, critical reflection, inclusive decision-making and valuing of teamwork and relationships.

A major obstacle we encountered was the lack of adequate safety and prevention equipment available for practitioners at the bedside. By conducting audits across the entire organization, comparing the resource needs with the current litigation and injury costs associated with fall injuries, we were able to develop a business plan that was compelling enough to obtain the resources essential to supporting evidence-informed care.

Because of the magnitude of this initiative, a best practice program infrastructure was developed. A Steering Committee, 3 task forces (skin, pain, falls), marketing, finance and communications sub-committees were established. A key feature was a deliberate interdisciplinary approach – all with a mix of nurses, patient attendants, rehabilitation therapists, clinical specialists, educators, physicians, researchers, nurse managers, a nurse executive, Quality department, technical services and patient representatives.

The combination of dedicated project leaders, advocates who can work across large systems, local champions, and researchers working together in teams was critical to the success of implementation of evidence into practice. The multiple roles played by designated facilitators is particularly significant given the tremendous pressure of competing priorities and demands that pull not only practitioners but mid-level managers and executives in many different directions. It was clear that investments to support these improvement infrastructures (teams of champions, project manager, task forces) are needed. Relatively low cost, they serve as important incentives. The fact that so many more persons and teams have been trained in knowledge transfer activities has significantly increased our capacity for future quality improvements.

An important outcome was increased collaboration across disciplines and across the 5 sites, following early periods of testing, uncertainty, and some territorial behavior. Practitioners and managers transcended their usual boundaries (and site cultures) to develop strong, collaborative and productive. They have maintained their commitments despite competing priorities. Why has this occurred? Many reasons explain it, but importantly, the fact that there were clear and shared goals and these were aligned with organizational priorities of a number of disciplines brought people together. Keeping them together was most likely due to the decision-making power and authority these teams were given to figure things out/ test/ experiment on their own, executive level buy-in and multiple levels of encouragement, funding support and recognition.

Learning New Practices & Interdepartmental Partnerships

A long-term commitment to reducing safety risks in healthcare such as pressure ulcers, fall injuries and unrelieved pain, involves changing provider (and client) behavior, as well as systematic changes in organizations, coalition-building and follow-up activities to promote new practices. These changes are not easy to make. Best practice guidelines were viewed as relatively easy to learn and the multiple bundled interventions seen as having positive effects on patient outcomes. The use of incentives, support for ongoing learning and recognition for leadership are important investments. Staff awareness of and education about the types of safety devices is also a mediating factor to effective use of safety equipment. Equally important is the alignment of all departments/ disciplines, committed to working together, on an effective safety agenda. Efforts are still needed to develop a “no shame, no blame” culture that encourages reporting of adverse events, and frontline staff involvement in shaping change.

Evidence is socially and historically constructed, and its implementation is affected by an interaction with contextual and other variables. Facilitators have the potential to work with managers and teams to articulate these issues, and enable the implementation of strategies that acknowledge and incorporate these factors. We saw that managerial style at the unit level had enormous effects, as local power holders are a strong influencing factor on rate of adoption; they need to be targeted for continuous learning and support. This group of middle managers is particularly vulnerable (and influential) as they literally work at the major crossroads of activity in a hospital. There are no other leaders or managers in our system that has as many direct reports as do the nurse managers. They are constantly bombarded with demands to carry out changes, and they generally lack basic resources of clerical and administrative support to assist them. Proper engagement and support to this group is essential to adoption of best practices.

Communication

In order to mount such a large-scale patient safety effort, we learned yet again how critical communication was. Multi-level and multiple forms of communication were continuously provided, but it was a challenge doing this on top of already hectic workloads. A recommendation is to fully engage one's communication department to assist with these needed efforts.

Conclusions

Since 2004, we have embarked on a journey to improve safety performance within a large 5-hospital health system that has been messy, complicated and huge in its scope. We have seen considerable improvements in reduction of adverse events such as pressure ulcers and fall injuries, and beginning improvements in managing the levels of moderate

to severe pain. For all three indicators we are performing better than benchmark levels. The gains made in improving patient outcomes have been steady and the practice changes have been sustained for the most part. Further progress will require considerable work on the documentation and informatics systems, as these were seen as serious obstacles to bedside practitioners. It is also clear that the ongoing human resource shortages will require redesign of roles and responsibilities within the interdisciplinary team to ensure that there are adequate and appropriate skill levels present to ensure patient safety.

The best practices program has ultimately touched almost all parts of the organization--from the bedside to the Board, to housekeeping, technical services, informatics, finance and volunteer services. Ensuring adequate infrastructure and resource support, a network of passionate and knowledgeable champions, and strong interdepartmental collaboration were key ingredients to our successes to-date. Creating a true culture of safety within an organization is a challenging venture, and cannot be done without buy-in particularly from the executive leaders. Our experiences have been well worth the effort.

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