

SPECIAL
ISSUE

Healthcare Quarterly

System Change ... is it within reach?

The third of four special issues prepared
with The Hospital for Sick Children,
Toronto, Mary Jo Haddad, Editor-in-Chief

ISSUE 3: HEALTH SYSTEM PERFORMANCE

Child Health in Canada



- MEASURING PERFORMANCE
- ACCESS TO CARE
- COMPLEX CARE
- TRANSITIONS
- SYSTEM CHANGE





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There is something unique and extraordinary about working with children. Perhaps it's their dependence on us for the fundamentals of care when they are in our charge. Maybe it's their innocence and their faith in us to help them be the best that they can be. And then there's their courageous strength and resilience. For these reasons and more, providers of children's healthcare have a focused determination and passion for their work.

In order to succeed in our efforts, we learn early on the importance of *collaboration*: labouring as partners as members of versatile teams. These values are nurtured in our work environments and they tend to foster innovative alliances that enhance systems of care. One of the advantages of our sector's relatively small size is that there are greater opportunities to learn from each other and to collaborate across traditional boundaries. The results of these activities are clear: early uptake and knowledge transfer that benefits the health of children and youth.

Collaboration and active learning are major thematic threads woven throughout this third issue in our Child Health in Canada series. In the following 15 essays, you will encounter fresh perspectives on *health system performance* as it pertains to planning, delivering and evaluating care for children and youth.

Measuring Performance

From 2002-2005, the Evidence-Based Practice for Improving Quality (EPIQ) trial resulted in "significant improvement in patient outcomes" in neonatal intensive care units across Canada. EPIQ has been described at length elsewhere. For this article, Catherine Cronin and her fellow researchers instead explain what they learned from surveying and interviewing EPIQ team members and physician leaders about change drivers and obstacles associated with the project.

Largely, this is a story about knowledge transfer and the social and organizational processes involved in adopting, implementing and assimilating new approaches to process – matters that resurface throughout this special issue. Cronin et al. learned that leadership and staff enthusiasm were insufficient drivers for overcoming barriers such as the lack of dedicated quality improvement expertise and financial resources; as well, few physicians had any significant understanding of quality improvement methods or concept of how to be quality improvement leaders. Based on their review, the researchers conclude that improving quality outcomes requires healthcare leaders and managers to take a strategic approach, one that, in particular, supports physicians' pivotal role in the quality matrix.

Our second article discusses a project by British Columbia's Office of the Provincial Officer of Health to identify indicators that are useful for defining and tracking child health and well-being in the province. The further, larger aim of this effort is to develop a durable measurement system that will inform health policy, programs and services. Eric Young and his co-authors'

main point is less about results and more about methodology. On this front, I am sure many of us will sympathize with the difficulties the team encountered when weighing scientific evidence. There is a lot to learn here from how the team dealt with such common problems as finding and defining evidence, as well as the frequent paucity of data.

The final Measuring Performance piece addresses developments at my organization, The Hospital for Sick Children (SickKids). My colleagues Aaron Smith, Jeff Mainland and Irene Blais document the evolution of SickKids' Office of Strategy Management in 2006 and the implementation of an organization-wide strategy management system. With regard to the latter, I hope many readers will find useful the discussion of the SickKids Scorecard, a tool that assists performance management by supporting our ability to "translate" strategy into action. As I reflect on both this article and my involvement in the process, I return to the critical role internal engagement, education and results reporting play in fostering organization-wide uptake.

Providers of children's healthcare have a focused determination and passion for their work.

Access to Care

The fact that our next section contains the most articles (six) reminds us that improving access to care is one of the most demanding areas of health system performance. Not unlike the contribution by Smith et al., the first article in this section continues to draw our attention to performance indicators. As part of the Canadian Paediatric Surgical Wait Times Project, Tamas Fixler and his co-authors analyzed capacity and demand in nine hospitals in five provinces. Project members found a "modest" and "ongoing" gap in pediatric surgical capacity; the good news is that changes such as additional elective operating room time, improved efficiency and adjustments to intensive care unit capacity can help to align capacity with demand. I know hospital administrators and government policy-makers will be interested not only in Fixler et al.'s findings, but also in possibly adapting their careful methodology.

The next essay takes us back to the theme of our second Child Health in Canada issue: the need to improve the mental health system. Rather provocatively – and, to my mind, convincingly – Karen Minden and Samantha Yamada argue that addressing wait times and system integration is "premature." To truly "fix" mental health care for adolescents, we need to know "what we are treating" and "what works." Like many other pieces in this issue, measurement and evaluation stand out in this paper as the sine qua non of effective change, a somewhat counterintuitive but persuasive contention.

While Minden and Yamada take us back to issue two, M. Judith Lynam and her co-authors return us to the very first issue of *Child Health in Canada*, which focused on the social determinants of health. Lynam et al. report on the Responsive, Intersectoral-Interdisciplinary, Child-Community, Health, Education and Research (RICHER) “social pediatrics” initiative. Underlining the importance we have encountered elsewhere of intersectoral and interdisciplinary collaborative efforts, the RICHER approach has been proven to foster access to primary healthcare for disadvantaged families. One of the points that leapt out at me was the initiative’s ability to empower parents to grow their own knowledge about their children’s health and how to navigate the health system. Surely these should be goals for nearly every child-and-youth health project.

At the Royal Victoria Hospital in Barrie, Ontario, the Paediatric Asthma Clinic (PAC) has been critical to tackling a thorny access-to-care problem that affects hospitals across the country. By leveraging the power of inter-professional care, Karen Fleming and her co-authors report, the PAC significantly lowered rates of emergency department visits and hospital admissions for paediatric asthma patients. The critical enabler is the important role patient and family education has played in generating these results and, as the authors say, “in reducing the burden of asthma in our community” as well as related healthcare expenditures. Education of another kind – this time, of staff – emerges as central in the piece by Karima Karmali and three of her colleagues who discuss efforts at SickKids to improve health equity through cultural competence programming. As the authors note, Eurocentric systems and services often fail to address the needs of increasingly diverse patient populations. Launched in 2009, the New Immigrant Support Network has helped to make cultural competence “an integral element in the provision of family-centred care” at SickKids’ organizational, clinical and structural levels.

The final piece in this section returns us to collaboration. At the Holland Bloorview Kids Rehabilitation Hospital, Toyota’s Lean methodology was adopted to revise the organization’s service delivery models. Rachel Deans and her co-authors shine a light on the team-based approach to improvement this initiative involved, the concerted measurement activities undertaken and (as we have seen in other articles) the essential involvement of leadership – both management and clinical. When wait times decrease as a result of such efforts, you cannot fail to be impressed. As the authors note, however, the next critical labour will be to ensure the sustainability of the many efforts that led to this accomplishment.

Complex Care

It is one thing to collaborate within an organization, but that ambition perches at quite another level of magnitude when several come together in a strategic partnership. The inter-

organization team and resultant Integrated Complex Care Model (ICCM) described by Eyal Cohen et al. was established among three Toronto organizations to provide integrated care for children with medical complexity (CMC). Two major components of the model were alignment with policy priorities and integration at the point of care. It will be fascinating to witness the evolution of this highly promising model, and I will be particularly interested to learn how the goal of developing “more creative strategies to engage CMC and their families” will be accomplished and the extent to which those strategies will further enhance care.

Eurocentric systems and services often fail to address the needs of increasingly diverse patient populations.

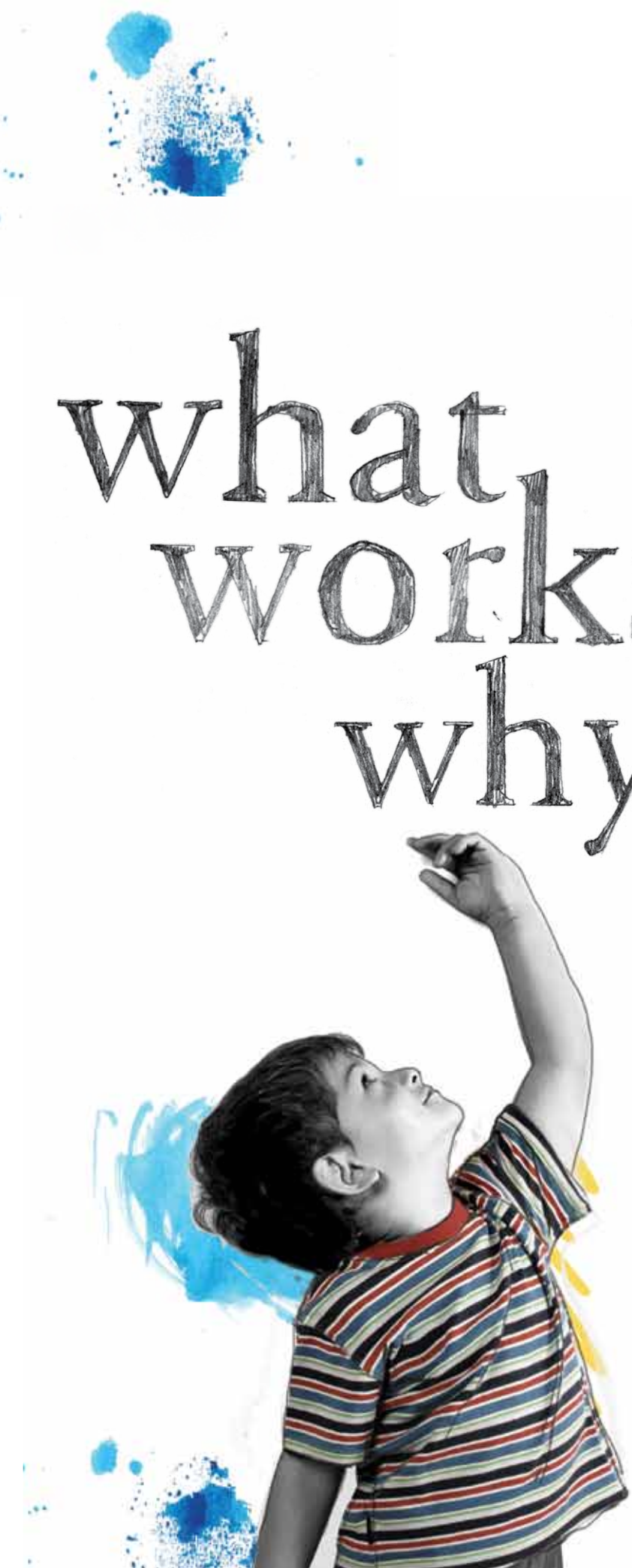
Transitions

One of the most frustrating obstacles in the children’s health sector is our frequent inability to ensure older adolescents experience a seamless transition into the adult healthcare system. This is the difficult terrain into which Khush Amaria and her co-authors stride in their paper, wherein they argue that “transition should be a process that begins in childhood and ends sometime in adulthood.” I admire this long-term sense of preparation and development, and I believe the authors’ identification of specific solutions (e.g., again, greater education) and tools will, if adopted, greatly improve individuals’ sense of well-being and even their health outcomes. Once again, though, success will depend on extensive and open collaboration, this time between adult and child-health service providers and organizations.

Adding evidence to support that point, the second article in this section addresses improvements recently made to transitioning neurosurgery patients from SickKids to Holland Bloorview for off-site rehabilitation. To date, the Kids in Transition program, Cindy Bruce-Barrett and her co-authors show, has “exceeded expectations” by, for instance, reducing the number of medically unnecessary days and the referral-processing time. As the authors point out, strategic leadership and a “highly functioning” improvement team were critical to effecting those dramatic improvements.

Systems Change

Pamela Fuselli and Amy Wanounou begin their contribution to the Systems Change section by stating the startling fact that “unintentional injury” kills more Canadians between ages 1 and 14 than any other cause. Unfortunately, injury prevention in this country is woefully lacking. However, we can, Fuselli and Wanounou assert, develop a “comprehensive and holistic



what works? why?

approach” to this “invisible epidemic” by, in part, learning from the experiences of other jurisdictions (e.g., Sweden). Taking a similar big-picture perspective on health system performance, Charlotte Moore and Marilyn Booth open a window onto Ontario’s implementation of fetal fibronectin (fFn) technology, which tells whether a woman is unlikely to deliver within two weeks of presenting preterm-labour symptoms. This program’s success demonstrates it is possible to make changes to complex health systems that result in improved care and cost-effectiveness through strategy-driven multi-party collaboration. I hope the authors are correct that this example of beneficial change can inform and inspire other system-level changes.

In Edmonton, Shawn Reynolds and two colleagues report on a project that is smaller and more local than the previous two, but that captures incisively many of the foundational themes found throughout this special issue. In their article, the authors discuss an innovative program that trained teams of parents and multi-disciplinary professional care providers to address more effectively problem behaviours among children with autism. The results of this experiment were positive in terms of behavioural gains and increased levels of parents’ satisfaction and perceived competence.

There is a common thread between this article and the RICHER project described earlier: the importance of giving mothers, fathers and other informal care givers the knowledge they need to take a direct hand in their children’s care. Widening the scope, there is an overarching lesson that, while often time-consuming and rarely straightforward, empowerment – of parents, staff, physicians, administrators and others – through education and collaboration really can make all the difference in our quest to build healthier lives, families, communities and entire health systems. **HQ**

– **Mary Jo Haddad**, RN, BScN, MHSc, LLD, CM
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The Hospital for Sick Children, Toronto, Ontario

Child Health in Canada

1 The Editor's Letter

Mary Jo Haddad

MEASURING PERFORMANCE

8 Reflections on Knowledge Translation in Canadian NICUs Using the EPIQ Method

Catherine M.G. Cronin, G. Ross Baker, Shoo K. Lee, Arne Ohlsson, Douglas D. McMillan, Mary M.K. Seshia and the Canadian Neonatal Network EPIQ Study Group

The Canadian Neonatal Network conducted a trial of Evidence-Based Practice for Improving Quality (EPIQ) between 2002 and 2005. Survey respondents agreed that EPIQ had a high utility, was effectively implemented and was a major learning opportunity. Results also demonstrated that better communication between clinicians and senior leaders is required to support quality improvement in NICUs.

17 Combining Vision with Evidence for Child Health and Well-Being Indicators in British Columbia

Eric Young, Michael Egilson, Nancy Gault and Bernie Paillé

How does a society know if the health and well-being of children and youth are improving, staying the same or getting worse? To answer these questions British Columbia's public health officer partnered with the Canadian Institute for Health Information to identify a set of indicators to define and track child health and well-being in that province.

21 Managing Strategy to Enhance Care for Children

Aaron Smith, Jeff Mainland and Irene Blais

This article provides an overview of The Hospital for Sick Children's strategy management system, outlining both best practices and the journey from its launch to induction into the Balanced Scorecard Hall of Fame. Performance, at all levels across the enterprise, has shown measureable improvement with the introduction of the comprehensive strategy management system.

ACCESS TO CARE

28 Pediatric Surgical Capacity and Demand: Analysis Reveals a Modest Gap in Capacity and Additional Efficiency Opportunities

Tamas Fixler, Rena J. Menaker, Geoffrey K. Blair and James G. Wright

The Canadian Paediatric Surgical Wait Times Project conducted an analysis of the alignment between capacity and

demand for pediatric surgery at nine participating hospitals in five provinces. The results showed a small gap in pediatric surgical capacity at these hospitals as well as issues related to occupancy in the intensive care unit at many hospitals. An examination of several key performance indicators indicated that opportunities exist for deploying existing resources more efficiently, such as increasing on-time starts and reducing cancellation rates for elective surgery.

35 Waiting for What?

An inquiry into the fundamental questions of how to fix adolescent mental health care

Karen Minden and Samantha Yamada

Improving the effectiveness of mental health and substance abuse care for young Canadians is a complex and pressing issue. As resources are being allocated toward reducing wait times and systems integration, the authors argue that the more fundamental challenge to addressing the crisis in mental health care for Canadian adolescents is to urge treatment providers and agencies to clearly define the goals and mechanisms of treatment, while evaluating program impacts in order to generate knowledge about what works and why.

41 The RICHER Social Pediatrics Model: Fostering Access and Reducing Inequities in Children's Health

M. Judith Lynam, Lorine Scott, Christine Loock and Sabrina T. Wong

In this article, the authors report on the RICHER (Responsive, Intersectoral-Interdisciplinary, Child-Community, Health, Education and Research) social pediatrics initiative, which was designed to foster timely access to healthcare across the spectrum from primary care to specialized services for a community of inner-city children who have disproportionately high rates of developmental vulnerability. Results demonstrate that the RICHER model not only effectively fosters access for families with multiple forms of disadvantage but also improves outcomes by empowering parents to become more active participants in care.

47 Hospital-Based Inter-professional Strategy to Reduce In-patient Admissions and Emergency Department Visits for Pediatric Asthma

Karen Fleming, Brian Kuzik and Chee Chen

The Royal Victoria Hospital (RVH) of Barrie, Ontario, has developed a best practice model of care for pediatric asthma in which primary care providers and emergency department (ED) physicians are actively encouraged to refer children with any recurrent respiratory problems consistent with asthma to the Paediatric Asthma Clinic (PAC). Ongoing outcome monitoring has revealed that, compared with 12 months prior to enrolment in the PAC, patients show a two-thirds decrease in asthma-related ED visits and an 85% decrease in admissions.

52 Enhancing Cultural Competence for Improved Access to Quality Care

Karima Karmali, Linda Grobovsky, Jennifer Levy and Margaret Keatings

In 2009, The Hospital for Sick Children embarked on a quality improvement initiative to address health disparities and to enhance health equity through cultural competence programming. The goal was to achieve optimal health outcomes for all patients and families, with a particular focus on new immigrant and other vulnerable populations. This article provides an overview of this hospital-wide initiative, as well as the evaluation methods and outcomes.

58 Finding a Balance between Value Added and Feeling Valued – Revising Models of Care

The human factor to implementing a quality improvement initiative using LEAN methodology within the health care sector

Rachel Deans and Shawna Wade

Through implementing Lean methodology, a management system for continuous improvement, the authors' organization has made an impact on increasing access to care and has supported the successful engagement of staff in the process. At the same time, it has ensured that the focus remains on the central needs of clients and families accessing services.

COMPLEX CARE

64 Integrated Complex Care Model: Lessons Learned from Inter-organizational Partnership

Eyal Cohen, Cindy Bruce-Barrett, Shauna Kingsnorth, Krista Keilty, Anna Cooper and Stacey Daub

Providing integrated care for children with medical complexity in Canada is challenging as these children are, by definition, in need of coordinated care from disparate providers, organizations and funders across the continuum in order to optimize health outcomes. The authors describe the development of an inter-organizational partnership constructed of an acute care hospital, a children's rehabilitation hospital and a home/community health organization focused on children who frequently use services across these three organizations.

TRANSITIONS

72 Tools for Addressing Systems Issues in Transition

Khush Amaria, Jennifer Stinson, Geraldine Cullen-Dean, Karen Sappleton and Miriam Kaufman

Moving from pediatric to adult healthcare is a time of stress and opportunity for adolescents with special healthcare needs and their families. The goal of transition care is to provide young people with a coordinated, uninterrupted and developmentally appropriate transfer to adult healthcare. This article outlines how a well-planned, coordinated and developmentally appropriate transitioning program, along with a proper transfer from pediatric to adult healthcare, can improve adherence to treatment in these young people and decrease loss to follow-up.

77 Kids in Transition: The Rehab Experience

Cindy Bruce-Barrett, Alastair Hodinott, Arbelles Manicat-Emo, Tonya Flaming, Daune MacGregor, Iris Hogan, Chris Carew and Sandi Cox

For years, the number of medically unnecessary days associated with patients awaiting transfer from The Hospital for Sick Children to Holland Bloorview for off-site rehabilitation was driven by inefficient processes, multiple handovers, duplicious efforts, fragmented communication and a lack of timely or complete referral information. Recognizing this threat to access, as well as patient health outcomes, SickKids and Holland Bloorview embarked on an exciting partnership - Kids in Transition: The Rehab Experience. This article provides an overview of the initiative, highlighting the improvement team's efforts, the outcomes and, most importantly, the factors considered critical to the success of implementing and sustaining process improvements on an ongoing basis.

SYSTEM CHANGE

84 Canada and the World: A Comparative Approach to Injury Prevention

Pamela Fuselli and Amy Wanounou

Few are aware that unintentional injury is the leading cause of death for Canadian children and youth between the ages of one and 14. Unintentional injuries are a leading public health issue; however, investment in injury prevention has not kept pace with other public health interventions such as tobacco control or infectious disease prevention programs. In this article, the authors lay out the current position of injury prevention in the Canadian and global contexts, and provide a comprehensive review of the growing need for an injury prevention strategy in Canada and its potential impact on the Canadian healthcare system.

90 Fetal Fibronectin Testing in Ontario: Successful Government-Sector Collaboration to Achieve High Quality and Sustainable System Change

Charlotte Moore Hepburn and Marilyn Booth

Ontario's province-wide implementation of fetal fibronectin technology, a test to identify women unlikely to deliver within two weeks of presentation with symptoms of preterm labour, is a notable example of evidence-informed system improvement and productive government-sector partnership. Amassing clinical and care utilization information, framing the data in a policy-relevant context and partnering sector expertise with ministry capability resulted in this technology being effectively implemented in a complex health system.

95 Training Care Teams of Children with Autism Spectrum Disorders in Positive Behaviour Support: An Innovative Approach

Shawn Reynolds, Shane Lynch and Sandy Litman

The authors developed a workshop to help parents and teams address the behavioural needs of children with autism using a positive behaviour support approach. Measures of participant satisfaction, parent satisfaction and efficacy and child behaviour suggested this training as an effective intervention. This innovative model suggests potential for teams struggling with communication challenges in addressing problem behaviours in children with autism.

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Measuring Performance

Results play a critical role in fostering organization-wide uptake



Reflections on Knowledge Translation in Canadian NICUs Using the EPIQ Method

Catherine M.G. Cronin, G. Ross Baker, Shoo K. Lee, Arne Ohlsson, Douglas D. McMillan, Mary M.K. Seshia and the Canadian Neonatal Network EPIQ Study Group*

Abstract

The Canadian Neonatal Network conducted a trial of Evidence-Based Practice for Improving Quality (EPIQ) between 2002 and 2005. Improved neonatal intensive care unit (NICU) outcomes established credibility for quality improvement. We surveyed team members and physician leaders to examine critical success factors and barriers to improvement during EPIQ. Respondents agreed that EPIQ had a high utility, was effectively implemented and was a major learning opportunity. The collaborative nature of the project was key to success. Respondents identified the need for additional training and resources in quality improvement. Better communication between clinicians and senior leaders is required to support quality improvement in NICUs.

It has long been recognized that geographical outcome variation is associated with variation in practice and resource utilization (Fisher and Wennberg 2003; Lomas et al. 2005). While standardization and continuous quality improvement have enabled industry to vastly improve quality outcomes (Liker 2004), consistent execution of validated clinical strategies is slow and variable in healthcare, and notable clinical successes are often irreproducible at different locations. Clearly, context is critical in complex social interventions (Berwick

2008; Hillman et al. 2005; Pawson and Tilley 2007; Verhoef and Leis 2008). A variety of research methods may be required to triangulate the evidence required to understand not only what happened, but *how* (Sharek 2007).

Sankaran et al. (2002) and others (Chien et al. 2002; Evans et al. 2007; Marshall et al. 2005; Richardson et al. 2001; Tarnow-Mordi and Parry 1993) have shown risk-adjusted variation in mortality and morbidity in neonatal intensive care units (NICUs). Synnes et al. (2001) showed that variations in intraventricular hemorrhage rates in Canada were attributable to NICU practice differences. Clearly, opportunities for process improvement exist in many Canadian NICUs (Lee et al. 2000).

Neonatal care in Canada is highly regionalized. Tertiary neonatal care is provided by 30 NICUs that serve distinct geographical regions and coordinate care with a network of primary- and secondary-level facilities. The Canadian Neonatal Network (CNN) is a group of Canadian researchers, founded in 1995 by Dr. Shoo Lee, who collaborate on research issues related to neonatal care. CNN maintains a standardized NICU database that supports local benchmarking, epidemiological research and systems improvement on a national scale. Detailed clinical data are collected on each patient whose NICU stay is equal to or greater than 24 hours, or who dies or is transferred to another level-two or -three facility within 24 hours. All data are cleaned of

*See Appendix at <http://www.longwoods.com/content/22539>

patient identifiers prior to uploading to the coordinating centre for analyses. Individual patient consent for data collection is not sought. CNN presently includes 29 of 30 tertiary-level NICUs across Canada, though only 17 NICUs were members when the Evidence-Based Practice for Improving Quality (EPIQ) study began. In 2004, CNN received the first Canadian Institutes of Health Research (CIHR) award for knowledge translation.

Twelve CNN NICUs participated in the EPIQ project (Lee et al. 2009) from October 2002 to September 2005, while the other five NICUs acted as a comparison group. The 12 NICUs in this study were major tertiary-level regional NICUs representative of four geographical regions of Canada (two NICUs in British Columbia, four in Prairie provinces, four in Central Canada, two in Atlantic Canada), and included approximately half the tertiary NICU beds in Canada. All NICUs were academic centres. In each unit, an academic neonatologist, who was already affiliated with CNN, led the implementation of the study and established a multidisciplinary team for the purpose. Two NICUs were in stand-alone children's hospitals with independent boards and management; all others were programs or operational divisions of a regional health authority. All but one centre were co-located with obstetrical services. The size and composition of the healthcare team varied among centres and included professionals with a variety of educational backgrounds and countries of origin.

Methods

The primary goal of the EPIQ project was to improve neonatal outcomes in Canadian NICUs. We specifically addressed the incidence of nosocomial infection (NI) and bronchopulmonary dysplasia (BPD). These outcomes were chosen because they are associated with a significant burden of illness, they are clearly defined and their root causes have been extensively researched. We hypothesized that the implementation of the EPIQ method would decrease the incidence of NI and BPD in Canadian NICUs.

Intervention

We have previously demonstrated how multi-level modelling methods can be used to identify practice differences associated with outcome variation for targeted interventions and to quantify their attributable risks (MacNab et al. 2004). Building on these observations, we developed the EPIQ model. EPIQ is based on three pillars: (1) the use of evidence in the published scientific literature, (2) the use of data from participating hospitals to identify hospital specific practices for targeted intervention (gap analysis) and (3) the utilization of a national network to share quality improvement expertise. EPIQ recognizes the importance of local context, customizing interventions and implementation strategies to maximize improvement potential at each hospital, while providing leadership and peer support for ongoing improvement efforts through CNN.

The study intervention has previously been described in detail (Lee et al. 2009). Briefly, 12 participating NICUs were randomly divided into clusters of six. One cluster (the NI group) collaborated to reduce the incidence of NI; the other (the BPD group) collaborated to reduce the incidence of BPD. A third non-randomized comparison group of five NICUs was not involved in any intervention. During the one-year baseline period, education and systematic reviews were conducted; there was a two-year intervention period, during which the infection and pulmonary groups worked independently of each other. Intervention strategies were targeted toward the specific gaps in evidence-based practice found in each NICU; evidence included best practice as described in the literature as well as local data. Clinical data were collected throughout the study period. Each centre participating in this study obtained approval from the local research ethics board.

Investigating Organizational Factors

Based on the literature on change management and implementation of innovations in healthcare (Greenhalgh et al. 2004; Guldbrandsson 2008), a 57-item retrospective survey was developed to assess the perception of team members and physician leaders of the importance of recognized drivers of change during the EPIQ project, using a five-point Likert scale ranging from *strongly disagree* (one point) to *strongly agree* (five points). Qualitative comments were also invited. Following the conclusion of the intervention phase of the EPIQ study, consent was obtained to circulate the survey electronically to local investigators as well as to team members at each participating hospital, using Survey Monkey™. All data collection was anonymous. Identical surveys were circulated to local investigators and to other team members. Responses were rated by the degree of agreement with each statement. Attributes were then grouped into seven themes (utility, implementation, communication, teamwork, leadership, system support and competition) and aggregate scores were calculated for each attribute in each group.

Written consent was obtained from a subset of the site investigators for confidential telephone interviews. Focus questions were developed based on the literature, the survey results and input from the director of CNN. Semistructured interviews, lasting 30–45 minutes, were recorded and transcribed. Exploratory description (Speziale and Carpenter 2006) and naturalistic inquiry (Sandelowski 2006) were used to investigate emerging themes.

Funding

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Results

Changes in the Process of Care

The consensus lists of practice change strategies developed by the NI and BPD groups, and the prioritization of change strategies, have previously been described (Lee et al. 2009). Each hospital's approach was unique, guided by the gap analysis resulting from the literature review and local data.

Patient Outcomes

In the NI group, there was a significant ($p < .01$) decrease in the incidence of NI (32% decrease from baseline) during the intervention phase of the study. In the BPD group, there was a significant ($p < .01$) decrease in the incidence of NI (45% decrease from baseline), BPD (15% decrease from baseline) and death or BPD (12% decrease from baseline). There was no significant change in other secondary outcomes, nor was there any change in primary or secondary outcomes in the non-randomized comparison group.

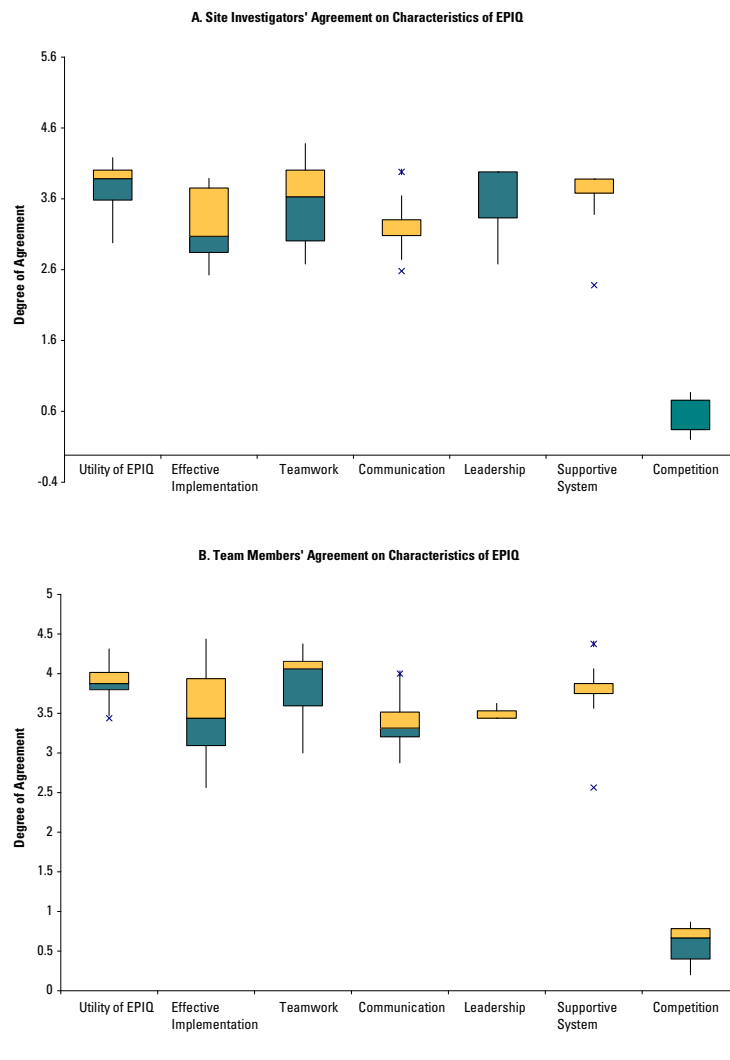
Survey Results

Two groups consisting of 11 site investigators and 16 team members, respectively, completed organizational surveys. Both groups had similar perceptions of the utility of the EPIQ method, effectiveness of implementation at their site, teamwork, communication, leadership, having a supportive organization and the existence of competition between centres. In general, there was moderate to strong agreement that EPIQ was a useful method and was effectively implemented. Respondents assigned low ratings to some drivers of innovation cited in the literature, including adequacy of the budget, the existence of "slack" (the capacity to take on improvement activities) in the unit, technical support and feedback from the coordinating centre, top-down implementation, homogeneity of staff and physicians, competition between centres and peer pressure from other investigators (Figure 1).

Interviews with Site Investigators

Six interviews were conducted with site investigators, all experienced academic neonatologists. Their previous experience with quality improvement varied from minimal to extensive. Two had never attended a quality workshop prior to the study.

FIGURE 1. Perceptions of site investigators and team members regarding EPIQ



EPIQ = Evidence-Based Practice for Improving Quality.

Team Composition

While the study protocol provided some direction on the composition of the site teams, respondents reported that team composition was highly site specific. Team size varied from six to 12 people and was not correlated with hospital size. Teams consistently included neonatologists and a variety of nurses, including front-line and advanced practice nurses and nurse educators. Teams addressing NI included infection control personnel, infectious diseases specialists and/or a microbiologist; teams addressing BPD generally included a respiratory therapist. Quality improvement personnel, administrators, nutritionists, data abstractors, executives and residents were less frequent inclusions, and no team included a family member. The compo-

sition of some teams changed during the project as members developed different interests, were assigned different responsibilities or left the organization. All but one team confined their administrative input to those with direct responsibility for the NICU, typically the patient care manager or equivalent and the neonatal division head. One team included the chief nursing officer. Site investigators all identified one or more individuals within the team, as well as other front-line staff, who became champions for the project.

Team Learning

For many respondents, EPIQ was their first foray into quality improvement. Among their new insights were the difference between quality improvement and quality assurance, and the importance of an organized team, breaking the process into manageable steps, multiple change cycles, buy-in and visible feedback. Even those who were seasoned administrators indicated that EPIQ had helped them learn how to change the system. The following was among the comments of positive experiences:

“I learned how easy this can be when what you are doing is aligned with the mission and strategic direction of the board, which is sending messaging down to managers – when you have the right people on your team, when they can lead and make decisions and when your unit is not policy bound.”

In contrast, another individual stated the following:

“We didn’t have the skill set, tools or knowledge to really be effective. There was nobody on the team who had the authorization to make decisions about policy making or financial resources.”

Other difficulties cited included the length of time taken to obtain the requisite approvals and the challenges associated with communicating with hundreds of staff. Some investigators were surprised by both the complexity of the system and that the process changes were so rapid:

“I felt that rather than having to push, there was a pull. Outcome changes were so dramatic.”

Another investigator was surprised by the ability of a simple audit tool to change practice within a very short time. All respondents strongly felt that the EPIQ approach was helpful in achieving improvement. Specifically, they indicated that bringing different disciplines together “broadens your view of the world about things that physicians and nurses don’t learn in their training,” providing a “commonality of purpose” and “focusing the team and providing an impetus.” Others appreciated the “support and experience of your colleagues across

the country to draw on.” It was felt that EPIQ helped people “see the possibilities, both as regards innovative processes and better outcomes. I do think it gets their competitive spirit going. When an initiative goes well, it makes the team really proud of their achievements, and that helps morale.” “We’ve made lots of progress,” stated another respondent.

Investigators developed an awareness of variation in the results of Plan-Do-Study-Act (PDSA) cycles, some proving effective, some not. They realized that the effectiveness of change management may have impacted outcomes. One noted that natural variation in local outcomes over time tended to mask these effects, making the combined efforts of many centres more valuable in seeing the big picture.

All respondents remarked on the importance of collecting process data that would not normally be collected in the course of clinical care. Indicators that proved useful in specific centres included the number of skin breaks, time between birth and surfactant administration, and number of days on a ventilator. Data were important at all levels:

“Indicators are important: people at the bedside should be aware of process and outcome indicators. We need to bring process measurement to the bedside.”

“We had the ability to look at potential changes in a scientific framework.”

“Until we got national data back, we didn’t realize we didn’t benchmark very well. The data provided fuel to go to administration, so they had no excuse not to help. I think those statistics should be in the public domain; and once we had data I would tell parents that we had a high risk of NI.”

Inability to access data for timely feedback was seen as a barrier. Sustainability was felt to be a particular challenge for academic centres with a high turnover of trainees.

Drivers of Quality

Several respondents cited leadership, management and strategic directions of the organization:

“The region is very supportive of quality and safety. However, in neonatology, because of our involvement in EPIQ, we are way above other departments. Both administration and people at the bedside are very supportive.”

“It was absolutely key that the board had set a new strategic direction on quality. The hospital devoted resources to measurement, and made all managers accountable for improvements in process and outcome in their areas. In this context, EPIQ was a win-win for everyone.”

“A third driver was [the principal investigator’s] visit. He met with the hospital executive and program leaders. He had great credibility, and this helped us as well as other programs.”

Barriers to Quality

There were several comments on the importance of human resources for data collection, communication and administration of the project:

“I felt that rather than having to push, there was a pull.”

“We needed three things: resources to collect data, to analyze them and turn it into changes and policies and to educate. We got a grant from the foundation, but it was not enough, and to complete the project I was going to have to pay for it out of pocket; but eventually the data convinced the hospital to pay for it.”

“Everybody is so work overloaded. A unit of this size merits somebody whose focus is [quality improvement].”

“It’s a fairly time-consuming process overall but good value for money.”

It became clear that the infrastructure and funding to support quality improvement are highly variable across Canadian NICUs. Respondents perceived that there was little excess capacity to take on quality improvements.

While some noted the importance of visionary leadership, cultural issues, including lack of professionalism, were seen as barriers. Respondents perceived that organizational readiness involved both leadership at the senior management level and an absence of internal barriers to improvement:

“Some units are just not ready for EPIQ. If they do not have the structure, or are policy-driven units, change is very difficult to implement. Some units have bureaucratic and autocratic obstructions to change. The best unit is one where everybody feels valued. Smaller units seem to really jump on it, while bigger units have difficulty.”

Quality Management Systems in NICU

The availability of dedicated quality improvement support staff for the NICU varied widely, from none to 2.0 full-time positions. Quality improvement staff included quality improvement nurses, case reviewers reporting to risk management and abstractors. Some units had access to regional resources but did not generally depend on external quality improvement staff to support EPIQ.

Some, but not all, NICUs had quality improvement committees, and some established them during the project. One investigator remarked on the paucity of infection control resources, which has been reported across Canada (Zoutman 2009).

Decision Support Tools

These investigators clearly viewed conventional sources of decision support tools as being inadequate to meet the requirements of continuous quality improvement:

“National clinical guidelines are not helpful because they are always out of date. So is the Cochrane Library. Even recent reviews may be out of date.”

Few wish lists included complex electronic tools. Rather, they emphasized simple quality tools, timely process information, information exchange and educational tools:

“[We needed] timely reports that could identify the impact of change, the process results of improvement; ...virtually no interval between acquisition of the data, analysis and interpretation; ... many simple paper decision tools, for example, PDSA forms, skin break audit forms.”

“Give people the tools they require to teach their juniors: create [quality improvement] modules for respiratory therapists, nurses and physicians. This teaches the teachers as well, for example, in how to make decisions about infection control.”

Investigators reported many structural, process and cultural changes in their units as a result of the EPIQ project:

“There’s a much higher level of consciousness about quality. It’s discussed on ward rounds and handover rounds. We have a weekly morbidity meeting, Friday for half an hour. The issues are documented and filed for future reference.”

“The unit has started using 12 indicators of good practice that are measured on every baby.”

Respondents had many excellent suggestions for improvement of the EPIQ process. A major theme was education on quality improvement:

“Train people right from the outset. Physicians aren’t taught the basis of quality care and resource utilization. The two go hand in hand; for example, when you order a white blood cell count and differential, the differential may not even be useful in a neonate, but someone in the laboratory spends 20 minutes counting those white cells, time that could be used for something else. Quality needs to be taught in the under-

graduate and apprenticeship domains, and in a fundamental way. We make too many cognitive errors.”

The importance of communication and data feedback was a common theme. Along with regular teleconferences, it was suggested that there be improved use of a variety of communication methods:

“Involve more nurses and allied health people. Listen to the needs of the stakeholders, and design communications that they need. Increase the rapidity of outcomes feedback. Establish a network of ‘go to’ people who can provide support for centres and teams who are having problems. Provide a showcase for teams to share their achievements. Use the web more effectively. Make the site more user friendly and use web conferencing and editable document sharing in repositories.”

“[Focus groups] really made a difference to buy-in and stimulated dialogue.”

Other respondents noted the need to incorporate resourcing of quality management systems into operational budgets and national standards, and the potential payback:

“We need education of the senior leadership team at hospitals so that they see this as a vital part of patient care. We need to get the concept of assessment of outcomes into the minds of people who are making decisions with tight budgets; for example, we’ve got to convince people that you need to spend 3% of that budget on measuring the outcomes of the other 97%.”

“Targets are important, for example, the range of infection rates is A–X. We want to reduce the variation to B–Y nationally. Locally, we want to reduce it to Z.”

“Think globally, act locally. Quality is so context sensitive that it cannot be ‘controlled’ by a national centre. Develop and publish a set of quality management standards for neonatal services. They would include, for example, having quality expertise on site. We could work with Accreditation Canada on this.”

Networks

The respondents were unanimous that being part of a collaborative and supportive network of peers and mentors contributed to success:

“We need to build a well-established network of [quality] experts.

“There must be recognition by the local centres that we can’t do it alone. It’s a combined community project.”

Discussion

The EPIQ project brought together teams from a large number of Canadian NICUs to examine the evidence and to identify and correct gaps in their own best practice; it resulted in significant improvement in patient outcomes. The changes made were predominantly process improvements rather than technological innovations. Prior to the study, all units had had opportunities to implement these improvements independently but had not done so. Units that were not involved in the intervention groups had no improvements in outcomes during the course of the study. We can infer, therefore, that involvement in the study itself was the catalyst for change.

“Train people right from the outset.”

In recent years, there has been increased interest in knowledge translation (Straus et al. 2009) and at least two systematic reviews of factors influencing diffusion, implementation and sustainability of innovation in healthcare organizations (Greenhalgh et al. 2004; Robert et al. 2009). It is clear that adoption, implementation and assimilation of change comprise both social and organizational processes. An evidence-based approach to change management must include the improvement of decision-making processes, increasing capacity to absorb new knowledge, ensuring a receptive organizational context for innovation and improving organizational readiness for the specific innovation (Robert et al. 2009). Management literature advocates a combination of strategies to increase organizational readiness, including highlighting the gap between current and desired performance, generating dissatisfaction with the status quo, creating an appealing vision of a desired future state and fostering confidence that the vision is achievable (Armenakis et al. 1993; Kotter 1996; O’Connor and Fiol 2006; Sweeney and Whitaker 1994). Many of these concepts are based on anecdotal experience and are not grounded in research. Weiner (2009) has developed a model of organizational readiness for change, which he defines as a shared psychological state in which organizational members feel committed to implementing an organizational change and confident in their collective abilities. Herscovitch and Meyer (2002) observed that staff can commit to implementing change for a variety of reasons: because they value the change, because they have no choice or because they feel an obligation to do so. Valuing the change reflects the highest commitment to organizational change. The EPIQ process is an appealing method of galvanizing academic physicians to lead

change, grounded as it is in their explicit and implicit professional values of delivering evidence-based care.

Weiner (2009) notes that staff take into consideration the organization's structural assets and shortcomings in formulating judgments on the efficacy of change in the particular situation at hand. Change efficacy is higher when people share a sense of confidence that collectively they can implement a complex organizational change. Feedback from team members suggests that the EPIQ structure and process bolstered both teams' knowledge about quality improvement and confidence in their own abilities to effect change.

Involvement in the study itself was the catalyst for change.

Insights from the surveys and interviews following the study suggest that many of the cultural drivers of innovation were present in the participating NICUs. The leadership and enthusiasm of staff were evident. However, several barriers were noted. First, neither dedicated expertise nor financial resources for quality were consistently available in Canadian NICUs. Where quality expertise was available, it facilitated improvement. Second, most site investigators were physicians who had received little or no training in quality improvement methods prior to this study. The learning associated with this study enabled them to develop from novices to leaders in quality. Third, the fact that few site investigators engaged senior executives in the project suggests that these physician leaders had a limited understanding of the considerable strategic importance of the EPIQ project to their own organizations, and of the potential benefits of having an ally on the senior management team. In a study of the relationship between information and influence in hospitals conducted in the 1980s, Provan (1991) noted that while physicians had a high degree of clinical autonomy, they were at the lower end of the information gradient with respect to management information, and had the least amount of influence compared with chief executive officers and the board. EPIQ increased physician and team knowledge on best practice, built competencies in quality improvement and change management and facilitated the ability of neonatologists to lead positive change within their units. Models such as EPIQ present excellent opportunities to foster physician leadership skills in quality improvement, which historically has often been viewed by physicians as the domain of other health professionals.

Gittell (2000) described *relational coordination* as a team competency required to work effectively in service operations that are highly uncertain, interdependent and time constrained, as NICUs typically are. Relational coordination is characterized by frequent, timely problem solving communication and

by helping, shared goals, shared knowledge and mutual respect among workers. It is essentially a network of communication and relationship ties among workers and can be thought of as a form of organizational social capital likely to enhance organizational performance. Relational coordination improves service quality and clinical outcomes for patients while reducing lengths of stay (Gittell 2000). We speculate that involvement in EPIQ could increase relational coordination at sites. This is worthy of further study.

Gittell and Weiss (2004) studied networks within and across healthcare organizations and have developed a multi-level framework for intra- and inter-organizational design. They postulated that the elements of organizational design (e.g., routines, information systems, team meetings and boundary spanners) can improve quality and efficiency performance by strengthening networks both within and between organizations.

Lave and Wenger developed the concept of a community of practice (COP), which they defined as "a system of relationships between people, activities, and the world," stating, "developing with time, and in relation to other tangential and overlapping 'communities of practice' is an intrinsic condition of the existence of knowledge" (1991: 89). Wenger (1998) identified main characteristics of COPs and three key dimensions: (1) members interact with one another, establishing norms and relationships through *mutual engagement*; (2) members are bound together by an understanding of a sense of *joint enterprise*; and (3) members produce over time a shared repertoire of *communal resources*, including, for example, language, routines, artifacts and stories. As a long-standing and well-established research collaborative, CNN has contributed to relationship building and the exchange of ideas between investigators and between their sites for over a decade. The EPIQ project effectively leveraged the CNN into a COP.

Roberts (2006) notes that COPs can be applied in a wide variety of organizational settings. For business organizations to fully leverage their knowledge capacities, they must seek to harness COPs that straddle their organizational boundaries. COPs require cultivation if business organizations are to fully exploit their benefits. Roberts cautions that COPs are not stable, that the demise of a community in the social context does not bode well for the adoption of COP, that they may have difficulty developing when the pace of change is accelerating, and that the use of a COP as a tool of knowledge management is likely to be more successful in those regions and nations that have a strong community spirit. We speculate that the existence of a universal healthcare ethos may be conducive to effective use of a COP as a knowledge management tool in the Canadian context.

In a meta-analysis of knowledge transfer (KT) within and between organizations, van Wijk et al. (2008) reviewed 251 effects from 83 independent samples reported in 75 studies. They concluded that organizations and units may equally improve their innovative capacity by leveraging the skills of

others through KT, that organizational size positively relates to KT, that ambiguity of knowledge hinders its subsequent transfer and that relational capital is arguably the most important network-level driver of organizational KT both within and across organizations. They recommended that organizations pursuing KT need to focus particularly on developing strong and trustworthy relations, especially within organizational boundaries. At the inter-organizational level, organizations must occupy a central position among many partners. Organizations need to carefully balance external structural and internal relational capital. Cognitive capital seems to be a critical element alongside structural and relational capital. Again, the strong relationships between CNN peers established over a decade were consistent with these drivers of knowledge translation. CNN is now embarking on a second, more advanced EPIQ project that will include both qualitative and quantitative assessments of organizational readiness for change and additional mentorship support for participating teams.

What are the lessons for Canadian healthcare leaders and managers? First, when knowledge translation is effectively implemented, there is tremendous potential for outcome improvement. Second, clinicians have a significant knowledge deficit in the areas of quality improvement and change management. Third, the local quality improvement resources available to Canadian NICUs are uneven and, in many cases, nonexistent. Fourth, a network or COP with effective physician involvement, leadership and well-developed relationships can be a driver of system improvement within and across organizations. Geography is no barrier to improvement. Fifth, lines of communication between clinicians and senior leaders must be strengthened.

Recommendations

Based on our experience, we make the following recommendations to support quality improvement in Canadian healthcare:

- Quality improvement education is required for clinicians of all disciplines and career stages, not just for managers. Physicians in particular need to be better equipped with the knowledge and leadership skills to support continuous improvement.
- Healthcare leaders must evaluate the business case for making significant investments in capacity building in quality improvement and clinician leadership at all levels within their organizations.
- Canadian healthcare organizations should develop, engage in, lead and evaluate outcomes of COPs focused on specific clinical populations. This is particularly important for highly specialized disciplines such as neonatal care, where provincial peer institutions may not exist. **HQ**

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Combining Vision with Evidence for Child Health and Well-Being Indicators in British Columbia

Eric Young, Michael Egilson, Nancy Gault and Bernie Paillé

How does a society know if the health and well-being of children and youth are improving, staying the same or getting worse? If one was to choose a manageable set of indicators to follow over a 20-year period, what would it look like? Since we know that what gets measured focuses attention, programming and funding, the question is this: what measures, covering which aspects of the lives of children and youth, should be selected from a population perspective? Given the variety of world views that exist among the many child and youth service providers, as well as the multiple definitions of health and well-being, this question is particularly difficult to answer. This is what the provincial health officer (PHO) of British Columbia is facing with an upcoming report that will look at the health and well-being of children and youth in the province. To answer these questions the Office of the PHO has partnered with the Canadian Institute for Health Information (CIHI) to identify a set of indicators to define and track child health and well-being in British Columbia. The process of identifying this suite of indicators is committed to transparency, evidence and collaboration.

Over a decade ago, the PHO (1998) published a comprehensive report on the health of children in British Columbia, with more focused reports since then. At the time, the report was groundbreaking in that it looked at child health beyond physical health and considered how the social determinants of health impacted the lives of children. Building on this tradition, the PHO's vision for the updated report is that it will identify the factors and modifiable conditions and actions that truly make the most difference to both positive and negative child and youth health and well-being outcomes, and will inform health system decision-making in terms of policy, programs and services aimed at improving the lives of children in British

Columbia. The PHO's goal is to have a sustainable, solid measurement system that will support consistent and ongoing reporting over many years.

Project Governance

The project engages multiple government ministries and stakeholders involved in the delivery of services and programs. The structure of the project consists of three supporting bodies:

1. The Project Advisory Committee consists of senior government representatives from the health and social ministries and regional authorities, child health academics and other content experts. The purpose of the committee is to provide overall guidance and direction to the project.
2. The Technical Advisory Committee consists of operational staff and methodologists from government, academia and the health information realm to provide guidance on methodological issues such as survey design and interpretation.
3. The Project Working Group, consisting of the deputy PHO and representatives from the Ministry of Health, CIHI and the representative for children and youth, is responsible for the day-to-day coordination and administration of the project and for making recommendations to the Project Advisory Committee.

Project Overview

The project can be roughly broken down into two phases with five major tasks: (1) the *conceptual framework* – the development of a discussion paper and framework, and an expert workshop; and (2) *indicator selection* – relevance review, evidence review and the final selection of indicators.

Starting Point: A Conceptual Framework

Indicator selection initiatives, whether at the local, provincial, national or international level, typically involve obtaining expert feedback and conducting some form of consensus building on reportable indicators. However, selecting an agreed-upon set of indicators from diverse stakeholder groups is challenging: health-care experts, families, communities and policy-makers all have differing points of view and bear different responsibilities for protecting and promoting children’s health and well-being. In addition to relying on expert advice, indicators are frequently selected for reporting because they have been reported on in the past or because the data are conveniently available. Over 2,500 individual indicators have been identified that could potentially be used to describe children’s lives (Hanafin and Brooks 2009). With so many indicators available, a legitimate question this project had to contend with was, why not adopt an existing set of indicators developed by another group?

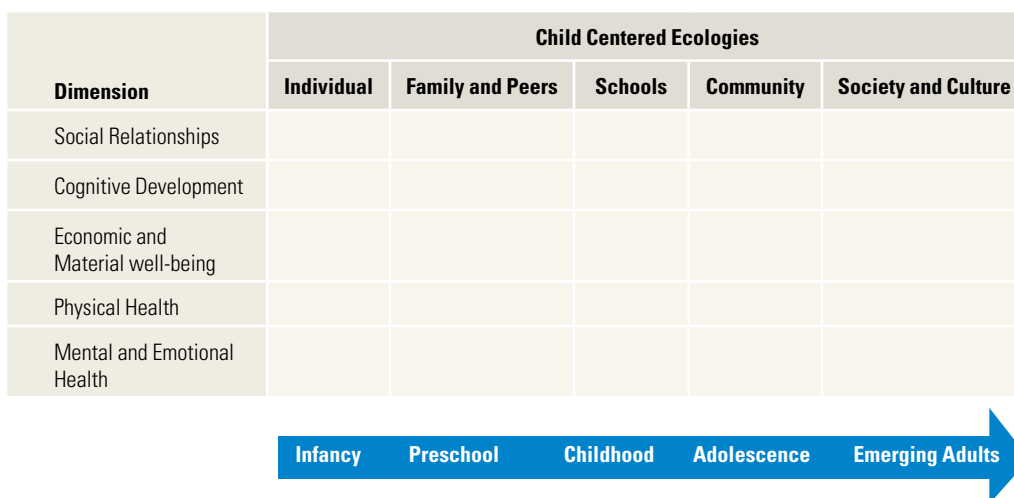
A unique contribution this project makes to the field of child indicators is the methodology; it began by looking at what creates health and well-being in children prior to identifying indicators. As a starting point, this project undertook an extensive review of the literature on healthy child development. The review produced a discussion paper, synthesizing the literature on what creates child health and well-being into a framework, and highlighting the importance of establishing criteria for selecting indicators prior to beginning the exercise

In September 2009, Dr. Ben-Arieh, an international expert on child health indicators, was invited to consult with members of the project team and comment on the discussion paper. His feedback was integral to the completion of the framework, which formed the basis for a validation workshop held in November 2009. Dr. Ben-Arieh stressed that no set of child health indicators would apply across all countries for all time. The important principle was to identify indicators applicable to British Columbia’s children and youth that are transparent and defensible based on existing evidence. This theme was echoed by workshop participants.

The 56 workshop participants – selected experts in child

health and well-being, policy development and indicator development – provided feedback on the indicator framework and indicator selection criteria. The purpose of the workshop was to promote a common understanding of the environments, opportunities, intrinsic factors, determinants and supports in a child’s development that are most likely to attribute to either positive or negative outcomes; and the interventions which are most likely to result in changes to the desired outcomes in health and well-being. Five overarching dimensions of child and youth health and well-being were identified: social relationships, cognitive development, economic and material well-being, physical health and well-being and mental and emotional health and well-being (Figure 1).

FIGURE 1.
Integrated framework for predicting child health and well-being across ecologies and over time in British Columbia



Indicator Selection

The second stage of the project was to identify and select the most appropriate indicators. The goal of the indicator selection was twofold:

- To identify reportable indicators, those for which evidence exists (e.g., linked to positive or negative outcomes in the literature, strong data exist to measure the indicator) to support their inclusion in the PHO’s report
- To identify information gaps, specifically aspects of the framework for which there is not sufficient evidence to include an indicator or for which indicators may not yet exist; these gaps represent opportunities for future measurement and reporting, addressing issues for which significant gains could be made in health and well-being as suggested by early-stage research

The discussion paper identified over 240 potential indicators and “concepts” corresponding to the dimensions and ecologies of the framework. In many cases, specific and definable indicators were not available, so the concept was defined as an area for measurement that may have multiple and possibly overlapping indicators. For example, one aspect of physical health is the concept of mortality, which can be measured by indicators such as infant mortality rates and perinatal mortality rates. It is also possible to “drill down” and measure mortality from a variety of causes (e.g., poisoning, motor vehicle accidents etc.). Therefore, it was decided to apply the filtering process to the concepts rather than the indicators, to reduce both the potential confusion between indicators and concepts and the potential burden on experts evaluating as many as 240 indicators. Identifying indicators aligned with specific concepts would happen at a later stage in the process. The process for selecting indicators involved a series of “filters” (Figure 2).

The team identified 125 concepts as likely areas for measurement that would provide the most comprehensive view of the health and well-being of children and youth. To maximize efficiency, the Project Working Group decided to apply the relevance filter before the evidence filter. Identifying relevance first ensured that no potential concepts or indicators were excluded due to a lack of current evidence. One of the objectives of the project was to identify information gaps; identifying relevant indicators even where data sources did not exist helped to achieve this goal.

Relevance Assessment

A modified Delphi approach, engaging validation workshop participants and other child health experts, was used to assess the relevance of the candidate concepts through an online survey. Participants were asked to assess the concepts against four criteria:

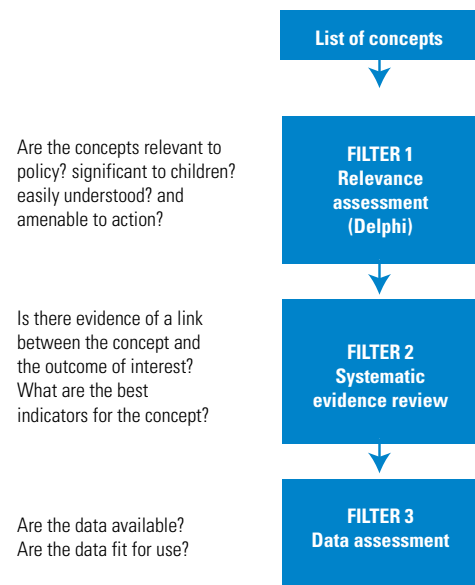
1. Relevance to policy (concepts should be amenable to effective action through policy, programs and services)
2. Significance to the health and well-being of children (refers to the combination of the magnitude of the issue being measured, i.e., its prevalence, and the impact it has on the health of children, i.e., its severity)
3. Ability to be easily understood by multiple stakeholders (concepts should be clear and easily understood by a wide variety of stakeholders, including the general public)
4. Ability to drive action (concepts are deemed important enough to engage policy or program change)

Survey respondents were also asked to rank order the 10 most important concepts within each dimension. This provided an additional prioritization of concepts. Participants were encouraged to write in further indicators if they believed the list of 125 was missing something. Few participants added additional

items, and no item was added by more than one participant.

In a separate initiative, based on joint work between the PHO and the representative for children and youth, a series of workshops and focus groups were conducted with young British Columbians asking them what they believed to be the most important indicators of youth health and well-being. This information was incorporated into the relevance filter for this project.

FIGURE 2.
Indicator selection filtering process



Survey results were evaluated in two stages. First, the rank ordering was used to prioritize concepts as there was insufficient variation in relevance rating scores to differentiate between most concepts. Second, the following two decision-making criteria were applied to including concepts for further consideration: (1) concepts should be ordered across the age span of the child and youth population and should reflect issues identified as relevant to those age groups; and (2) concepts should provide information relevant to First Nations and Aboriginal populations. The number of concepts was reduced from 125 to 93 based on this combination of evaluations, rankings and filtering.

Evidence Assessment

Once the number of concepts had been narrowed down, the final phase of the indicator selection process was an evidence assessment. Determining the methodology to be used for assessing evidence required a rigorous approach that addressed both the quality of the evidence for the concepts and indicators and the quality of the relevant data.

As a first step, a modified systematic review was conducted

for each concept. Borrowing from systematic reviews, the approach was designed to be targeted, transparent, comprehensive, relevant, synthetic, evaluative, summative and conclusive. Content experts were engaged to conduct the reviews for each of the five dimensions of the framework. Each expert followed the same protocol, designed to minimize the variation inherent in world views that exist across different topic areas. The reviews addressed two specific questions for each concept:

1. What is the recent scientific evidence that supports the adoption of this concept in British Columbia as a compelling expression or experience of at least one of the five dimensions of child health and well-being?
2. What are the pros and cons of the identified means of measuring this concept, that is, the measures that could serve as indicators of child health and well-being in British Columbia?

The evidence reviews have been completed, and the working group is currently in the process of evaluating the information. This will include further consultation with the Technical Advisory Committee to solicit feedback on differentiating between concepts/indicators that may require further evidence assessment and those that are sufficient for recommending for inclusion in the PHO report. These activities will be taking place over the summer and early fall of 2011.

Lessons Learned

The key message from the evidence review phase of this initiative was that evidence is a difficult and complex issue to address. Other learnings were also derived from this process:

- Finding evidence took longer than anticipated. For this initiative, the modified reviews were assigned based on the five dimensions of the framework. Indicator development and theory/construct knowledge require different skills. An understanding of both content and measurement was critical to the success of the evidence assessment process. Additionally, strong theoretical and construct knowledge does not necessarily imply expertise in the context of societal or system intervention through policy, program and service delivery.
- Finding a common language was time consuming. The modified review protocol included very specific and agreed-upon guidelines; however, differences in interpretation of terminologies and definitions still hampered the consistent application of these guidelines across the reviews.
- Determining how *evidence* is defined and what counts as evidence is difficult. Methodologies for collecting evidence can range from anecdotal to randomized control trials. Individual perceptions of evidence and the quality of evidence are variable as well. Some bodies of evidence (e.g.,

in the physical health domain) may be more “established” and easier to locate and assess. Recent theoretical developments, due to their relative “youth,” may not have sufficient evidence to support their relevance.

- The availability of data is not consistent across the dimensions of the framework. Data on physical health are readily available, in multiple forms. However, within the mental health and social relationship domains, data are not typically as readily available, making assessments of evidence more difficult.

Concluding Remarks

This project has presented multiple opportunities and challenges. Keys to maintaining momentum have been committed leadership, ongoing participation across a broad range of stakeholders, adequate resources and a stable team. The BC Ministry of Health and CIHI have maintained the same working group members throughout the life of the project.

Upon completion of this project, there are significant next steps to be undertaken for both the PHO and CIHI separately. The PHO will use the final suite of indicators to form the basis of the upcoming report on child and youth health and well-being within British Columbia, undertaking the effort to compile the data for each selected indicator. This work will be supported by the Project Advisory Committee, which will provide advice to the PHO. CIHI will have an opportunity to leverage these considerable learnings, applying this knowledge to indicator development at the pan-Canadian level. These discussions are likely to continue to present additional challenges and provide significant opportunities to improve the information and reporting on the health and well-being of children and youth across Canada. **HQ**

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Managing Strategy to Enhance Care for Children

Aaron Smith, Jeff Mainland and Irene Blais

Abstract

The adoption of the Balanced Scorecard philosophy of measure, monitor and manage by The Hospital for Sick Children (SickKids) has resulted in SickKids' staff understanding, appreciating and ultimately being able to accept the enhanced transparency and accountability around performance, at both the system and hospital levels. The leadership of the organization observed these differences after initial SickKids scorecard update meetings, realizing this was not a flavour of the month but a totally new way of operating in a quest to achieve SickKids' vision and mission. Almost immediately, the internal culture began to shift as staff better understood how their roles actively contribute to the organization's ability to execute on its strategy. Based on 2010 staff engagement results, 70% of staff "see a direct link between personal work objectives and SickKids' strategy," while 60% were familiar with the newly released strategic plan, unprecedented results based on current benchmarks. This article provides an overview of the SickKids strategy management system, outlining both best practices and the journey from its launch to induction into the Balanced Scorecard Hall of Fame. Performance, at all levels across the enterprise, has shown measureable improvement with the introduction of the comprehensive strategy management system.

In 2006, when strategy management was identified as a key enabler in the ongoing journey of The Hospital for Sick Children (SickKids) towards high performance, the chief executive officer (CEO) of SickKids established the Office of Strategy Management (OSM). Since then, SickKids has moved from an organization that simply had a strategy map and measures on a scorecard, to an organization that has now developed strategy execution as a core competency across the entire enterprise.

The OSM concept was developed in 2005 by Kaplan and Norton as an evolution of their performance measurement framework, the Balanced Scorecard (BSC). At its core, the BSC is a performance measurement framework that is the foundation for the execution of an organization's strategy (Kaplan and Norton 1996). While Kaplan and Norton have continued to evolve their BSC framework, SickKids OSM has grown from a unit of two people adapting and customizing the predominantly private sector tools for use in the public healthcare sector, into a unit within a larger corporate strategy and performance portfolio that contains both the OSM and Decision Support Services.

This article outlines the evolution of SickKids' OSM and the implementation of an organization-wide strategy management system, identifying areas where the hospital's approach has been recognized as best practice in the Balanced Scorecard

Hall of Fame, and discusses the results of SickKids measurement of its efforts to implement a strategy management system. Considering the complexity and scope of the organization, and the many other competing priorities in the operation of a large academic health sciences centre, it took ongoing determination and resolve of the SickKids leadership to ensure that effective strategy management became a reality. The article demonstrates that with thoughtful planning, building and strengthening of internal relationships, and leveraging of best practices in strategy execution from both the public and private sectors, SickKids has shown that strategy management with resulting impact can be implemented in a relatively short period of time.

Evolution of the SickKids OSM

In April 2005, the SickKids Board of Trustees approved the launch of a process to develop strategic directions, five high-level strategic priorities, that would identify key challenges and opportunities and determine strategies to position SickKids for the future. The planning process was led by the CEO with support from the Executive Committee and a Steering Committee on behalf of the SickKids Board of Trustees, and was managed by external consultants. Many changes, including new hospital leadership, new directions from the Ministry of Health and Long-Term Care of Ontario (MOHLTC) and the evolving nature of the healthcare system, made it necessary for SickKids to plan a course for the future that would provide focus and alignment to the changing landscape. SickKids had made many investments in clinical care, teaching and research to establish itself as a leader in children's health; however, in order to take its leadership and performance to the next level, it was important that a clear plan of action be developed for excelling in the core areas of strength. As a leader in children's healthcare, SickKids continually sets high standards for itself to maintain its position and provide leadership and direction to the child health system, government and other key stakeholders. In order to effectively measure and manage the organization's renewed strategy, the BSC, branded as the SickKids Scorecard, was adopted as the measurement and management tool of choice.

The BSC framework was chosen based on a review of the literature at the time. It had recently been implemented at the system planning level for MOHLTC, and it had begun to gain traction in other healthcare institutions both nationally and internationally (Yap et al. 2005). The measurement of health outcomes and, more broadly, the phenomenon of performance measurement have emerged as important public policy issues in healthcare both in Canada and globally (Brown et al. 2005). Empirically, Yap et al. (2005) found that 17% of the 129 acute care hospitals in Ontario use an institutional-specific BSC. Within this group, larger hospitals were more likely to have BSCs, with 42% of teaching hospitals having a BSC.

To ensure the successful execution of the SickKids strategic directions, SickKids introduced the OSM, in October 2006. SickKids' OSM is a centralized office, reporting directly to the CEO, whose focus is to provide a coordinated approach to strategy execution. OSM assists the organization to increase its focus on strategy through the five strategy focused organization (SFO) principles (Kaplan and Norton 1996):

- Mobilizing change through executive leadership
- Translate strategy to operational terms
- Align the organization to the strategy
- Motivate to make strategy everyone's job
- Govern to make strategy a continual process

Managing strategy was identified as a corporate support function similar to the management of finances by the finance portfolio, or the management of technology by the information management and technology portfolio. This concept is visualized in Figure 1, <http://www.longwoods.com/content/22535>.

OSM initially facilitated strategy management and the organization's focus on the five SFO principles through two key roles, adapted from Kaplan and Norton (2005): (1) coordination – define, develop and oversee the execution of processes required to manage the strategy; and (2) integration – assist in ensuring that operational processes owned and run by corporate services, and clinical, education and research services are linked to strategy. As with the customization of the BSC framework to apply to a public healthcare setting, SickKids customized the OSM function fairly quickly, to add a focus on strategy execution. The first addition to the SickKids OSM, beyond the original focus on developing the strategy management system, was a project manager to focus on the execution of organization-wide strategic projects impacting multiple portfolios. Over time, the project management function has become core to the ability of OSM to effectively develop strategies at all levels of the organization, adding a frame of implementation used throughout the development process. OSM has centralized non-information technology project management at the corporate level, and has an array of highly talented project managers with both clinical and corporate expertise.

OSM is now part of SickKids' strategy, performance and communications portfolio. This portfolio consists of four related sets of activities within the hospital: strategy development, strategy execution, performance measurement and communications. OSM takes the lead on issues of strategy development and execution (project management), while the hospital's Decision Support Team takes primary responsibility for the performance aspect of the portfolio, including organization-wide performance reporting and maintaining the SickKids Scorecard, the core element of the strategy management system. The Communications and Public Affairs Team ensures that all

communications are linked to organizational strategy and that all proactive public affairs are contextualized in this manner as well. OSM and decision support services work collaboratively to support the portfolio's overall mandate of strengthening enterprise performance management at SickKids.

In 2009, at the point where SickKids' strategic directions were naturally up for review, the hospital was able to turn to OSM to plan and execute a process to develop a renewed strategy, which was done entirely in house without the need for support by external consultants. Significant efforts were undertaken to ensure that the renewed directions chosen were meaningful and that the associated objectives were relevant and would lead SickKids to the overall achievement of its vision and mission. The resulting plan, *Avenues to Excellence 2010–2015*, has been noted both organization wide and within the broader community for its comprehensiveness and alignment to the wide variety of operational areas. It has also been cited by some international recruits as a key reason for their interest in SickKids. One of the major benefits that SickKids realized of having in-house strategy development is that the group responsible for the development also supported much of the execution of the resulting strategic initiatives. This level of continuity is difficult to achieve when a crucial function such as strategy development is outsourced to a third party. Bain & Company's *Management Tools* report (Rigby 2011) shows that strategic planning has been either the number one or number two management tool of choice since 2000, based on executive surveys. SickKids saw the importance of developing an internal capacity to perform this crucial function; since the development of the organization's strategy, SickKids OSM has led strategy development efforts in numerous clinical and support areas throughout SickKids.

SickKids Strategy Management System

The SickKids strategy management system contains adapted versions of both the classic and evolved elements of the Kaplan and Norton BSC framework, as outlined in their book *The Execution Premium* (2008). The following are the elements of the strategy management system:

- SickKids Strategy Map
- SickKids Scorecard
- Portfolio Action Plans
- Aligning Personal Performance Goals
- Operational and Strategy Review

SickKids Strategy Map

The foundational element of the strategy management system is the SickKids Strategy Map (See Figure 2, <http://www.longwoods.com/content/22535>), which outlines the vision, mission, values and strategic directions of the organization. As a complex academic medical health sciences centre, it is difficult

to capture what SickKids does on a single page; however, the strategy map achieves this in a visual way and is used to outline and communicate the organization's strategy to all levels at the hospital. The SickKids Strategy Map provides a visual depiction of how the organization aligns its resources to achieve a common goal; outlines the strategic objectives that collectively enable the organization to further its mission; and helps to unify and integrate components of the strategic plan so that

In large organizations only 5% of the workforce understands the strategy; at SickKids, 70% of staff "see a direct link between personal work objectives and SickKids strategy."

each objective is not seen merely as a discrete goal but part of a larger integrated picture. According to comprehensive research compiled by Renaissance Solutions Inc., CFO Magazine, and Business Intelligence (1996), in large organizations only 5% of the workforce understands the strategy. Based on 2010 staff engagement results, 70% of SickKids' staff "see a direct link between personal work objectives and SickKids strategy," while 60% were familiar with the newly released strategic plan. The use of the SickKids Strategy Map to communicate strategy set SickKids people on a clear path to strategy execution and proved to be an extremely effective communications tool.

SickKids Scorecard

The SickKids Scorecard is the part of a strategy management system that assists in the management of performance by enhancing the organization's ability to translate its strategy into action. The SickKids Scorecard (See Figure 3, <http://www.longwoods.com/content/22535>) is a set of quantifiable measures derived from the organization's strategy. As the management cycle evolves from strategic planning to operational planning and management, the SickKids Scorecard is used to measure, monitor and report on the key performance indicators (KPIs) that best measure the strategic objectives. This tool is also used to communicate to employees and external stakeholders the outcomes and performance drivers by which the organization will achieve its mission and strategic objectives.

Portfolio Action Plans

At SickKids, portfolio action plans are centred around the strategic directions from the SickKids Strategy Map and Scorecard, ensuring alignment between portfolio strategic objectives and corporate strategic objectives. Portfolio action planning is the process that OSM has developed and implemented to ensure that the entire organization is aligned and

working collaboratively to execute the organization's strategy. The strategic plan is cascaded to all SickKids portfolios in order to influence and shape each portfolio's contributions to organizational success. The cascading process facilitates top-down alignment and bottom-up execution, outlined in Figure 4 (<http://www.longwoods.com/content/ 22535>).

OSM facilitates planning sessions with SickKids portfolios to ensure that a consistent approach to alignment is maintained, and it provides expert guidance on managing strategy execution across SickKids. Before portfolio action planning occurs,

Strategy execution has truly become a core competency and part of the culture at SickKids.

a template is created from which the senior management team can work. The template consists of the strategic directions and is formatted to ensure that all portfolio initiatives are mapped to a specific strategic direction. Although these templates are not scorecards yet, the key performance indicators for some of the initiatives are reflected; therefore, the framework is in place for strategy map and scorecard development at the portfolio level.

Aligning Personal Performance Goals

Utilizing the portfolio action planning framework, personal performance objectives are planned with the same cascaded approach, to achieve bottom-up execution. At each level, the personal performance objectives are aligned with the corresponding level of organizational objectives (i.e., executive personal performance objectives are aligned with vice-presidential portfolio strategic objectives). This cascaded and aligned approach to portfolio and departmental strategic objectives ensures that employees see how they fit into the organization's (and portfolio's) strategy map and how they contribute to strategic objectives. Individual objectives planned in this manner are cross-functional (as linkages to other portfolios/departments are identified), focused on the long term (as they are aligned with SickKids' five-year strategic plan) and directly linked to the organization's strategy. Once personal objectives are set, indicators are selected from the respective portfolio scorecard (KPIs) or dashboard (operational performance measures) to ensure quantitative measures of performance throughout the year. It is the people on the ground every day who are executing SickKids' strategy, through rigorous planning and alignment, and optimizing performance related to the organization's strategic plan. Figure 5 (<http://www.longwoods.com/content/ 22535>) illustrates how the process is presented to staff in planning sessions, in this case, managers; note that it is the logical extension of the portfolio action planning process. Both

SickKids' Execution Premium from Balanced Scorecard Hall of Fame

The Balanced Scorecard Hall of Fame honours those organizations that have achieved an Execution Premium – extraordinary performance results – through the use of the Kaplan-Norton Balanced Scorecard management framework. It is awarded by Palladium Group, Inc. (www.thepalladiumgroup.com).

SickKids received Execution Premium honours for the following (2006–2010):

- Medication reconciliation rose from 33% of admissions to 78.3%.
- Hand hygiene compliance increased from 53.1 to 77.0%.
- Magnetic resonance imaging wait times fell from 11.7 to 7.7 weeks.
- In-patient overall satisfaction, already high, rose to 99.1%; pain management satisfaction jumped from 39.0 to 77.7%; and in-patient bed wait times from the emergency department dropped from 9.6 to 6.1 hours.
- Health and safety compliance rose from 69 to 84.5%.
- Core blood count test turnaround time decreased from 60 to 20 minutes.
- International revenue as a percentage of non-governmental and non-research revenue increased from 2.1 to 10.1%.

examples are used to reinforce the importance of alignment and the relationship between an employee's personal objectives and the organization's strategy.

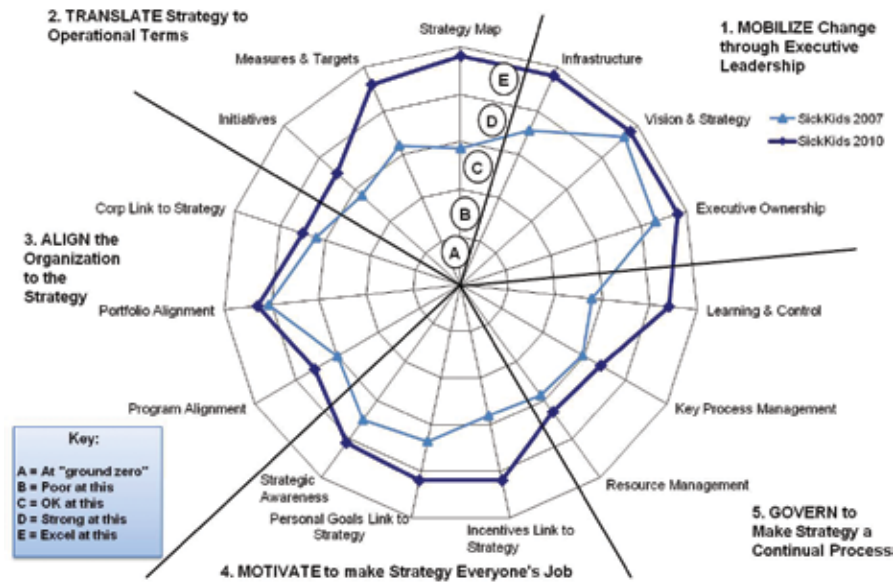
Operational and Strategy Review

One of the critical aspects of managing strategy is to separate strategy reviews and operational reviews (Kaplan and Norton 2008). As the strategy management system was being created and implemented, OSM continued to adapt and customize it to include the next evolution of the Kaplan and Norton BSC framework, what they termed *closed-loop management*, which established even stronger linkages between strategy and operations (Kaplan and Norton 2008). Figure 6 (<http://www.longwoods.com/content/ 22535>) outlines SickKids' customized closed-loop management system, showing the linkage between the operating plan and the strategic plan and the related execution. The closed loop shows how all of the elements of the strategy management system are integrated and occur iteratively to ensure measurement, monitoring and management of SickKids' strategy.

SickKids Strategy Management Assessment

In order to evaluate the focus on strategy at SickKids, OSM

FIGURE 7.
SickKids strategy management assessment results 2007 and 2010



Corp = corporate

Source: Data from SickKids' internal leadership surveys; structure from Palladium Group, Inc.

undertook an assessment of the five SFO principles at two points in time, 2007 and 2010. This evaluation is based on one designed by Kaplan and Norton (2001), which is performed across multiple industries. Surveys were conducted with the leadership team, including clinical, research and education chiefs, vice-presidents and directors ($n = 75$). The surveys contained questions pertaining to the subcategories of each SFO principle, and leaders were asked to rate the organization's performance in each area. Figure 7 demonstrates the significant improvement in all five areas of the SFO model over the course of three years, which coincides with the evolution of SickKids' OSM and the focus on managing the strategy. It shows the development of the capacity to maintain performance in each area and that strategy execution has truly become a core competency and part of the culture at SickKids.

Conclusion

During the implementation of the strategy management system, there were many obstacles that needed to be overcome. Firstly, as an organization with over a 100-year history of high achievement, people generally had too many projects already, which was a relatively strong barrier to adding another corporate-wide initiative that involved a lot of change management. Additionally, as with other "new" management tools, the perception that the

BSC framework was a fad and management gimmick had to be overcome. Lastly, education around the use of a new reporting tool, both on its structure and demonstrating its value within the organization, is no small challenge in an organization with roughly 8,000 staff, including 14 executives, over 90 directors and more than 250 managers.

While the full commitment of the CEO and the SickKids Board of Trustees greatly assisted in the uptake of the SickKids strategy management system, it was the achievement and sustainability of breakthrough results reported on the SickKids Scorecard that entrenched and validated the tools use at SickKids. Once people saw the results that were achieved at the

corporate level, all portfolios began to formulate strategies to cascade a BSC to the portfolio or business unit level, initiatives that are currently under way across all portfolios. The clinical portfolios have gone one step further and are cascading down throughout the business units into the more discrete departments. This is a testament to the value of the strategy management system at SickKids, as medical departments are inherently adverse to change and risk due to the nature of the work performed. New ways of managing must be truly tested, and all new models must be supported by substantive evidence, the evidence in this case being the great success seen at the corporate level with the SickKids Scorecard. In 2010, SickKids was inducted into the Balanced Scorecard Hall of Fame (see sidebar), for both the implementation of the Kaplan and Norton strategy management framework and, more importantly, achieving what is called the "Execution Premium" in both clinical and non-clinical areas. (Kaplan and Norton [2008] show that organizations using a formal system for implementing strategy consistently outperform their peers.)

For most healthcare organizations, hundreds of millions of dollars are literally in the balance when it comes to the successful and complete execution of strategy. Enterprise performance management has been a key focus for SickKids during the past five years. Having the SickKids Scorecard in place has

allowed the organization to measure, monitor and manage its performance to demonstrate to patients and families, as well as funders, that the organization is responsible, focused and committed to high performance and the achievement of its vision: "Healthier Children. A Better World." **HQ**

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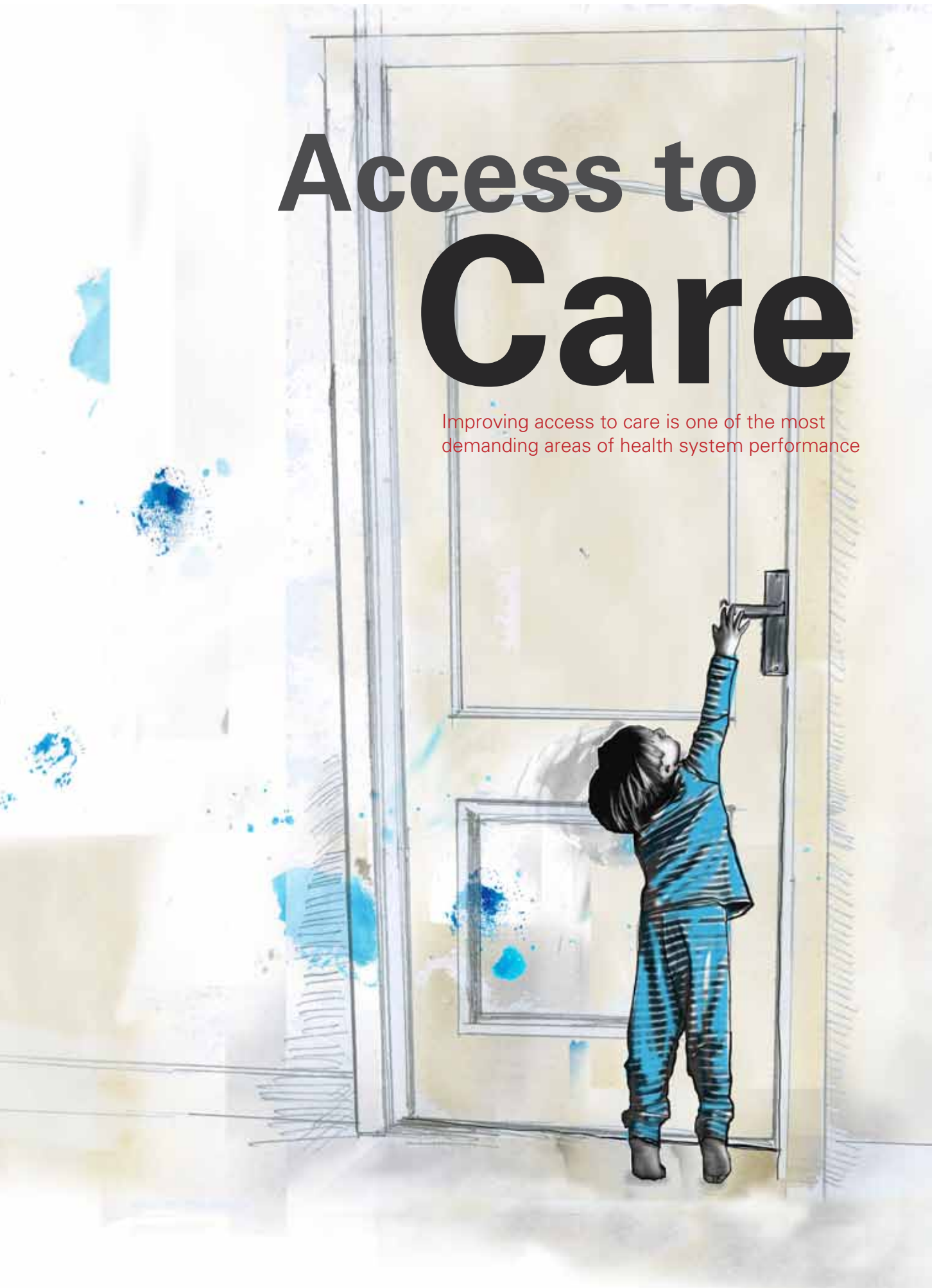
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Access to Care

Improving access to care is one of the most demanding areas of health system performance



Pediatric Surgical Capacity and Demand: Analysis Reveals a Modest Gap in Capacity and Additional Efficiency Opportunities

Tamas Fixler, Rena J. Menaker, Geoffrey K. Blair and James G. Wright

Abstract

The Canadian Paediatric Surgical Wait Times Project conducted an analysis of the alignment between capacity (supply) and demand for pediatric surgery at nine participating hospitals in five provinces. Demand for surgery was modelled using wait list data by assigning patients into monthly buckets of demand (“demand windows”) based on the date on which a decision was made to proceed with their surgery plus their surgical wait time access target. Demand was then related to available capacity for various key resources (e.g., operating room availability, intensive care unit [ICU] and in-patient beds). The results indicate a small and not insurmountable gap of 8.5–11% in pediatric surgical capacity at these hospitals. A further capacity issue at many hospitals was ICU occupancy. In addition, an examination of several key performance indicators related to the management of peri-operative resources indicated that opportunities exist for deploying existing resources more efficiently, such as increasing on-time starts and reducing cancellation rates for elective surgery.

Background

Prolonged waits for care are a common issue in publicly funded healthcare systems (Warnock 2005), prompting governments in Canada to make the reduction of wait times a priority. In January 2007, Prime Minister Stephen Harper announced

the launch of the Canadian Paediatric Surgical Wait Times (CPSWT) Project to measure wait times for children and youth in need of surgery. The CPSWT Project is the only national effort to measure wait times using standardized access targets developed by surgical expert panels. Access targets were developed for waits one and two: *wait one* is defined as the time from referral to initial specialist consultation, and *wait two* is defined as the time from the date on which a decision is made to proceed with surgery to the surgery date.

Developing access targets for patients’ waits and collecting wait times data enable the understanding and management of access-to-care challenges. One potential explanation for excessive wait times is a mismatch between resources and demand for surgery. The purpose of this analysis was to examine the alignment between capacity (supply) and demand for pediatric surgery at nine participating pediatric academic health sciences centres (PAHSCs) in five provinces. This analysis is consistent with the recommendation of the Health Council of Canada, which urges that “jurisdictions should make it a matter of policy to calculate capacity requirements for both elective and emergency cases based on their estimates of projected need” (2005: 7).

Methods for Analyzing Capacity and Demand

Multiple approaches were used to analyze the alignment between capacity and demand for pediatric surgery. These are discussed below.

Wait List Trends

One method for assessing whether a gap in capacity exists is to examine the trend in waiting cases. Fundamentally, surgical queues result from a short- or long-term mismatch between capacity and demand. Specifically, queues can be the result of a past backlog of uncleared demand, an existing and continuing gap between capacity and demand or some combination of the two. If the wait list is stable, the queue is likely the result of a past backlog of uncleared demand that potentially can be addressed with a short-term “surge” in capacity rather than a fixed increase in capacity (Naylor 1991). Conversely, if the number of waiting cases is increasing over time, this indicates an ongoing gap between capacity and demand, and an ever-growing wait list.

Established Principles of Capacity Planning

The principles of capacity planning, as outlined in the health-care operations management literature (Langabeer 2008; Rhyne and Jupp 1988), were used as a framework for further analyses of capacity and demand for pediatric surgery. The aim of capacity planning is to align capacity with demand, and this is generally achieved through a five-stage process, which is outlined in Figure 1.

Based on this framework, the first step involved the development of a model for estimating demand for pediatric surgery at participating hospitals. In its simplest form, demand is the arrival rate of patients into the queue (Mango and Shapiro 2001). However, modelling demand for elective surgery must account for the fact that patients with different diagnoses have varying maximum recommended wait times (access targets). Therefore, elective surgical demand was measured using each hospital’s wait list data by assigning all patients into monthly “demand windows” based on the date on which a decision was made to proceed with surgery plus their surgical wait time access target (for wait two). The access targets used for the creation of the demand windows were the Paediatric Canadian Access Targets for Surgery (P-CATS;

Canadian Paediatric Surgical Wait Times Project 2010), developed for over 800 surgical diagnoses by pan-Canadian surgical expert panels. For example, if a patient’s decision to proceed with surgery was made on February 1, 2009, and the procedure had an assigned P-CATS access target of six weeks, the patient was assigned to the March 2009 demand window.

Estimating demand using this methodology has several advantages. First, it measures demand in a way that reflects all cases in the queue, both waiting and completed. Second, it considers patients’ clinical acuity, as recommended by Zellermeier (2005). Third, research has shown that where different recommended wait times exist, optimal scheduling is achieved by scheduling lower-priority patients as late as possible without exceeding their wait time target (Patrick and Puterman 2008). Accordingly, the methodology used in this study assigned patients into demand windows based on their last day within target.

The second step in the capacity planning process was to translate this demand into capacity requirements. This was achieved by collecting data on the resources used by each patient on the wait list (e.g., the operating room [OR] time required for completion of the procedure and whether an intensive care unit [ICU] or in-patient bed was required). These data were then aggregated to estimate the capacity requirements for each hospital. For example, the elective OR time required for a hospital was estimated by summing the operating time (and turnover time) for each case in a demand window. Hospitals submitted only aggregated data for analysis.

The third step in the capacity planning process involved an analysis of existing capacity across key peri-operative resources. Participating hospitals identified the resources that drive surgical capacity (i.e., the most likely bottlenecks in the peri-operative process) at their sites via survey. The survey considered resources across the entire peri-operative process, including pre-admission clinics, day surgery units, OR resources and post-operative resources. The most commonly identified drivers of capacity were selected for analysis, including OR availability and ICU and in-patient beds.

Three of the participating hospitals are not dedicated pediatric facilities and share resources with adult patients (e.g., mixed OR time). In these cases, pediatric surgical capacity (i.e., OR availability for pediatric surgery) was estimated by scaling overall capacity based on the proportion of the case load that was pediatric and the average pediatric versus adult case length.

The fourth step involved measuring the gap between capacity and demand by combining (where possible) the estimates of required capacity (from step two) with the analysis of existing capacity (from step

FIGURE 1.
Stages of the capacity planning process



three) into “load percentages.” Load percentages relate required capacity to available capacity on a percentage basis. For example, an OR load percentage was calculated by relating the amount of elective OR time *required* in a period to the elective OR time *available* in the same period. A load percentage greater than 100% indicates that the demand for a resource exceeds its availability.

In the final step of the capacity planning process (but exceeding the scope of this article), strategies are developed to eliminate any gaps between capacity and demand. These strategies may include re-engineering processes to deploy existing capacity more efficiently, or adding or shifting capacity and resources (Langabeer 2008).

Analysis of Key Performance Indicators

Provincial ministries of health, hospitals, regional health authorities and non-governmental organizations have identified both insufficient resources and poor management of existing resources as the most common causes of excessive wait times (Sanmartin et al. 2000). Therefore, in addition to an analysis of capacity and demand, data were also collected on various key performance indicators related to the management of peri-operative resources. Key performance indicators commonly collected by participating hospitals were considered and included OR utilization, start time accuracy for the first surgical case of the day, the percentage of pediatric elective surgeries cancelled on the day of surgery and the average lengths of stay of surgical patients. Significant variation in performance indicators may indicate opportunities for hospitals to improve resource management by identifying areas where existing resources can be deployed more efficiently to increase patient throughput (i.e., the number of patients that can be treated in a period of time) without additional capacity.

Standardized definitions were used for the key performance indicators collected (e.g., all hospitals submitted OR utilization

data excluding turnover time). Where a hospital’s definition for an indicator varied materially from the standard definition, the data were excluded.

Findings

Nine PAHSCs in five provinces participated in this study. All data and findings are based on the period from December 2008 to November 2009, unless otherwise specified. The findings are aggregated across all hospitals.

Wait List Trends

The CPSWT Project wait list was empty at the onset of data collection as only cases with a decision to proceed with surgery date of September 2007 and onward were included. As a result, there was a sharp initial increase in the number of waiting cases added to the CPSWT Project wait list as it became populated. The wait list was deemed to be mature when the rate of increase in waiting cases showed a sharp levelling off, which occurred in May 2008. Therefore, the wait list trend is examined only from this point of maturity, as from this point onward any increase in the wait list may be assumed to be natural (and hence indicative of a gap between capacity and demand).

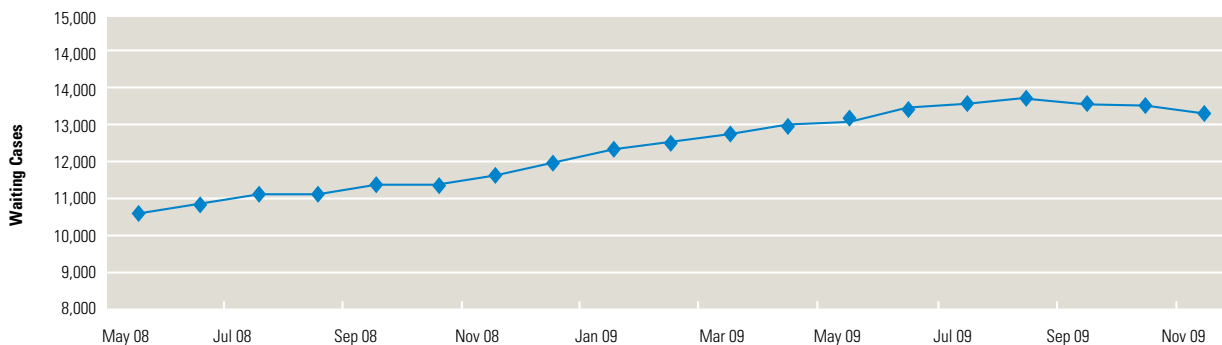
A significant increase ($p < .001$) in the number of elective surgical waiting cases over time was observed at the participating hospitals for the period of May 2008–November 2009 (Figure 2). Eight of the nine hospitals showed a significant increase in the number of elective waiting cases over this period.

Load Percentages

To further analyze the alignment between capacity and demand for pediatric surgery, load percentages were calculated using the capacity planning methodology outlined above.

A case load percentage was calculated relating the demand

FIGURE 2.
Trend in waiting cases from May 2008 to November 2009 at participating hospitals



The trend in waiting cases is shown from the point when the wait list reached maturity (May 2008), which was determined to be the point when the rate of increase in waiting cases levelled off and the wait list became fully populated.

for elective surgical procedures (i.e., the number of cases requiring surgery in a demand window, as outlined above) to the actual elective case volume completed by the hospital in that period. The average case load percentage across all hospitals was 108.5% (see Table 1), with eight of the nine hospitals having case load percentages over 100% for the period analyzed.

To assess capacity and demand for OR time, an OR load percentage was calculated by relating elective OR time *required* by a hospital in a period to the elective OR time *available* at the hospital in that period. The average OR load percentage across all hospitals was 94.4% (see Table 1). An adjusted OR load percentage was also calculated to adjust elective OR time available for 85% utilization. The average adjusted OR load percentage was 111.1% (see Table 1), with seven of the nine hospitals exhibiting adjusted OR load percentages greater than 100%. The monthly variability in the average case load percentage and the average OR load percentage are shown in Figure 3.

ICU and In-patient Beds

Bed occupancy rates, which show the use of beds by measuring the average percentage of time that they are occupied, have been used to examine the relationship between capacity and demand for acute hospital beds (Bagust et al. 1999). The median and range of average ICU and in-patient unit occupancy rates are shown for the participating hospitals in Table 2.

In order to allow for natural fluctuations in demand, 80–85% occupancy has been proposed as an appropriate target for general, short-stay hospitals (Bagust et al. 1999; House of Commons Committee of Public Accounts 2005; Shonick 1972). For both the ICU and in-patient unit occupancy rates, the median value was above the 85% threshold. Five of eight hospitals had an average ICU occupancy rate above 85%, and five of nine had an average in-patient unit occupancy rate above 85%. A significant correlation between the average ICU and in-patient unit occupancy rates at the hospitals was not found ($r = 0.45, p = .26$). However, a significant correlation was observed between the OR load percentage and the ICU occupancy rate ($r = 0.74, p = .04$).

Key Performance Indicators

Select key performance indicators were also analyzed to assess the efficiency with which existing capacity was deployed. Raw OR utilization data (excluding turnover time between patients) were in the range of 68–81% for all but one hospital and were therefore relatively consistent. Other indicators, however, showed considerable variability across the hospitals, indicating

TABLE 1.
Load percentages for December 2008 to November 2009

	Case Load Percentage	OR Load Percentage	Adjusted OR Load Percentage
Average	108.5	94.4	111.1
Minimum	97.7	56.3	66.2
Maximum	118.8	122.1	143.6

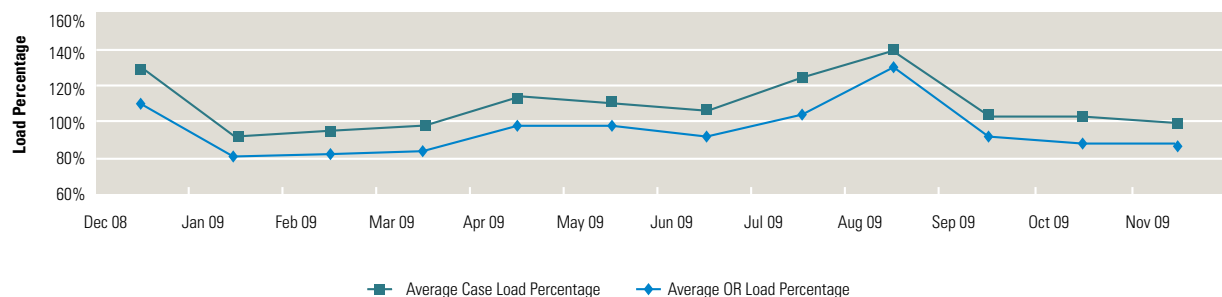
OR = operating room.

TABLE 2.
Average ICU and in-patient bed occupancy rates* for December 2008 to November 2009

	ICU Occupancy Rate (%)	In-patient Unit Occupancy Rate (%)
Median	87.9	86.1
Minimum	43.3	60.9
Maximum	101.4	97.8

*Eight hospitals provided intensive care unit (ICU) occupancy rate data. All occupancy rates are combined surgical and medical rates.

FIGURE 3.
Average case load percentage and average OR load percentage by month



potential opportunities for improving capacity use. Start time accuracy for the first surgical case of the day (which was defined as the percentage of first cases with the patient in the OR at the scheduled start time) ranged from 3 to 58%, with a median of only 25% for six hospitals providing these data. The percentage of pediatric elective surgeries cancelled on the day of surgery ranged from 5.2 to 16.8%, with a median of 6%. Finally, the average length of stay of surgical patients in the ICU ranged from 1.3 to 5.6 days, with a median of 2.8 days; whereas the average length of stay of surgical patients in the in-patient units ranged from 2.7 to 5.3 days, with a median of 3.9 days.

Attempts to reduce wait times and waiting lists simply by adding resources do not always succeed in the long term.

Discussion

Modest Gap in Capacity

The aggregated findings presented above consistently suggest a modest gap in pediatric surgical capacity at participating hospitals. The number of elective surgical waiting cases showed a significant increase over the period from May 2008 to November 2009, suggesting an ongoing misalignment between capacity and demand (see Figure 2). While the number of waiting cases does appear to level off and even decrease slightly toward the end of 2009, this may be due to seasonal effects, as a similar levelling off is observed for one year earlier.

The average case load percentage suggests the need for hospitals to increase their throughput by an average of 8.5% to meet demand. Further, eight of the nine hospitals had case load percentages over 100%, indicating that most would need to increase their case volumes by varying degrees to meet the demand.

An average OR load percentage of 94.4% would appear to suggest that elective surgical demand can be managed in the available OR time, if the time is used efficiently. In reality, however, 100% utilization is not realistically achievable (since it would require a perfect alignment of resources with no disruptions) and, thus, *effective* OR capacity is less than all available OR time. Therefore, an adjusted OR load percentage was also calculated to adjust elective OR time available to 85% utilization (including turnover time between patients), a commonly used benchmark (Stodd et al. 1998). The average of 111% suggests the need for 11% additional OR time on average for these hospitals, or less with improved use of existing OR time. Further, seven of nine hospitals had adjusted OR load percentages over 100%, indicating that most would need either some additional OR time or to improve efficiency (or a combination of both).

The average case load percentage and average OR load percentage displayed significant month-to-month variability (see Figure 3), driven by variability in both capacity and demand.

In particular, the increases in the load percentages observed in December 2008 as well as July and August 2009 were largely driven by the fact that most hospitals operate at reduced OR capacity during these months due to holiday-related closures. Variability in demand is driven by both the arrival rate of patients to the wait list as well as their case mix (since they are assigned into demand windows based on their access targets).

The median ICU and in-patient unit occupancy rates were above the proposed 80–85% targets, suggesting the availability of these beds is a significant driver of capacity at many of the hospitals. Moreover, a statistically significant correlation was observed between the OR load percentage and the ICU occupancy rate, suggesting that constrained capacity in the ORs is generally associated with constrained capacity in the ICU as well. The lack of correlation between the ICU and in-patient unit occupancy rates, however, suggests that high occupancy in one unit does not necessarily indicate high occupancy in the other.

Occupancy rates consistently above the 85% target may make it difficult to manage natural demand fluctuations and peak periods, resulting in delays and long wait times for beds (Bagust et al. 1999), and may also increase the rate of hospital-acquired infections (Cunningham et al. 2006). However, other factors also need to be considered in capacity planning. For example, a hospital with a highly variable daily patient census may not even be able to achieve 80% occupancy without creating excessive wait times for beds. Conversely, a hospital primarily handling elective patient admissions may have a relatively constant daily census, in which case a higher target occupancy rate may be appropriate (Shonick 1972). Thus, the 80–85% target should be viewed only as a general guideline.

The observations presented above are broad findings based on aggregated data and, therefore, cannot be applied to individual hospitals. In fact, a few hospitals may not have capacity constraints at all, as suggested by their static wait lists, load percentages below 100% and relatively low bed occupancy rates.

Opportunities for Improved Efficiency

Prior experience, both in Canada and abroad, has shown that attempts to reduce wait times and waiting lists simply by adding resources do not always succeed in the long term (Sanmartin et al. 2000). This is especially true when additional resources are added in the absence of other initiatives, such as those aimed at cleaning up wait lists or improving operational efficiencies. The key performance indicators outlined above showed considerable variation between the hospitals, indicating an opportunity for some hospitals to improve efficiencies within their peri-operative processes.

Start time accuracy for the first surgical case of the day has been suggested as a significant indicator of surgical suite efficiency (Zellermayer 2005). If true, the median of only 25% and wide range of 3 to 58% indicate opportunities for more

efficient resource use. In addition, frequent same-day surgical cancellations can negatively impact the efficiency of the surgical suite. The wide range in cancellations also suggests opportunities for improvement. While 43% of same-day cancellations were due to medical reasons that may be outside of a hospital's control, 22% were due to patient-initiated factors (such as non-compliance with guidelines, which may indicate inadequate patient education and preparation) and an additional 9% were due to a scheduled surgery exceeding its booked time (suggesting inaccurate scheduling practices). A further 7% were due to the unavailability of ICU and in-patient unit beds.

Research conducted by the UK National Health Service has found that bed unavailability is not necessarily due to bed shortages but may be caused by delayed discharges or patients occupying beds unnecessarily (i.e., patients that could have been treated on an outpatient basis; NHS Modernisation Agency 2001). While the considerable variation in the average ICU and in-patient unit lengths of stay between the hospitals outlined above is partly the result of variations in case mix, it may also be the result of varying practice patterns and discharge rules, suggesting additional opportunities for improving capacity utilization. Disciplined discharge procedures can increase effective bed capacity by ensuring that beds are not occupied by patients who do not require them (Walley et al. 2006).

Study Limitations

This analysis has several potential limitations. First, demand as estimated by the load percentages was measured using each hospital's wait list data (for wait two). However, wait lists can show significant year-to-year variability, and only one year of data was examined in this study. Thus, while all of the above findings consistently point to a modest gap in pediatric surgical capacity, precisely quantifying this gap would require an analysis of several subsequent years of longitudinal data. In addition, the demand for surgery itself may be affected by the wait list through a "feedback" phenomenon. Added capacity and shrinking wait lists may result in lower thresholds for certain elective procedures or specialist referrals, thereby increasing demand (Naylor 1991; Sanmartin et al. 2000). As well, demand is unlikely to be static over time and may vary due to demographic factors.

Second, only those resources that participating hospitals identified as the most critical to overall surgical capacity were examined. However, other peri-operative resources not examined in this study may also impact patient throughput and affect timely access to surgery at some hospitals. These resources should be considered in future analyses to ensure that fixing a capacity shortage in one area does not simply shift the bottleneck elsewhere, as the most constrained resource or stage in the process ultimately determines the throughput of the entire surgical process (Langabeer 2008). For example, increasing OR time will not solve a capacity shortage if there are insufficient

surgeons and nurses to use the time or there are insufficient post-anesthesia care beds to support the increased throughput.

Finally, while standardized definitions were used for the key performance indicators collected, minor variations among hospitals likely remained. However, while these variations may have contributed slightly to the range observed in the findings, the variations in definitions were likely small as hospitals adjusted their own internal definitions to conform to the standardized definitions used for this study or, if they were unable to do so, their data were excluded.

Conclusion

In conclusion, the findings presented in this study suggest a modest gap in pediatric surgical capacity at participating hospitals. Most hospitals demonstrate a need for some additional elective OR time or improved efficiency based on current levels of demand. In addition, constrained OR capacity appears to be associated with constrained ICU capacity. The observations presented are based on aggregated findings and, therefore, cannot be applied to individual hospitals.

Hospitals can use the "demand window" framework developed in this study to examine multiple years of longitudinal data to more precisely quantify their gap between capacity and demand. In addition, an examination of several key performance indicators related to the management of peri-operative resources indicated that opportunities exist for deploying existing resources more efficiently. **HQ**

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Waiting for What?

An inquiry into the fundamental questions of how to fix adolescent mental health care

Karen Minden and Samantha Yamada

Abstract

Improving the effectiveness of mental health and substance abuse care for young Canadians is a complex and pressing issue. Currently, there is a focus on reducing wait times and facilitating “system integration” as proposed solutions to the crisis in mental health care. As resources are being allocated toward pursuing those two solutions, the authors argue that the more fundamental challenge to addressing the crisis in mental health care for Canadian adolescents is to urge treatment providers and agencies to clearly define the goals and mechanisms of treatment while evaluating program impacts in order to generate knowledge about effective approaches to treatment. In essence, the authors suggest asking two fundamental questions: What are we treating? And what works?

Drawing from insights gained through the creation of a mental health treatment centre at Pine River Institute and the development of subsequent collaborations with various clinical and research communities, the authors outline the importance of clarifying the goals and mechanisms of mental health treatment and creating better definitions and measures of treatment success as a strong foundation for moving toward decreasing wait times and increasing system integration. More specifically, they suggest that the government’s most effective role is to increase system capacity by setting standards for excellence. The government can increase system capacity by requiring accountability through

accreditation and outcome evaluation; increasing resources for program evaluation; and encouraging innovation by funding research into potentially effective treatment that can contribute evidence to the field of adolescent mental health and substance abuse treatment.

We have heard countless personal stories from desperate parents about what it is like to watch their child in a downward spiral marked by issues with mental health, substances and life-threatening behaviour. Their stories are compelling, real and terrifying, and they put the issues of adolescent mental health care in perspective. These families run from psychiatrist, to family doctor, to addiction counsellor, to foster home, to police station and to youth shelter. Parents prowling through back alleys in the middle of the night, in –20°C weather, hoping to find their child alive. They resort to begging youth court judges to hold their child in a detention centre so at least they know the child is safe. They implore gatekeepers of secure psychiatric units to keep their child until they can find some follow-up treatment that will provide the containment required to allow time for healing. No one holds the hands of these parents while they weave through the confusing maze of treatment options, and there is little support while they are waiting for access to care.

There is no question that the “system” of mental health care for young Canadians is in dire need of improvement (Kirby

2006). The statistics tell us that one in five Canadians will experience a mental illness in any given year (Health Canada 2002); the majority of mental illnesses begin during adolescence and young adulthood (Health Canada 2002); and in 2007–2008, \$14.3 billion of public expenditures was spent on mental health services and supports in Canada (Jacobs et al. 2010). For those families who do access treatment, current approaches include brief intervention, outpatient treatment, limited residential treatment, psychopharmacology, substance substitution, brief incarceration or brief hospitalization. Still, there is very little evidence about which treatment modalities work (Brannigan et al. 2004; Hair 2005; Hoagwood et al. 2001; Plant and Panzarella 2009; Williams and Chang 2000) and very little consensus and understanding about the purpose of different treatment approaches or the effectiveness of currently used approaches. Many professionals and policy makers – like the desperate families they wish to serve – are reacting to the challenges of simply accessing treatment without pausing to evaluate what we propose are more fundamental and critical questions: What are we treating? And what works?

Access Is Not a Sufficient Measure of Success

The response to the crisis in mental health care from those who contribute to mental health policy is currently on improving timely access to assessment and treatment by *reducing wait times* and increasing system integration by making *every door the right door*. Although such changes would be welcomed, they are premature if we cannot answer the questions of what we are treating and what works. A component of access is the ability to receive quality treatment, with demonstrated effectiveness. A helpful analogy might be to imagine a patient with acute appendicitis. Let's say that there is centralized access and the patient is referred to one of five hospitals, each with a different conceptualization of appendicitis, and each with a different treatment approach and no evidence of treatment effectiveness. What would the rationale be for referring the patient to any particular hospital unless the medical problem is clearly understood and the particular hospital's treatment approach is explicit and supported by evidence?

Now consider the problem with an adolescent struggling with severe substance use, who is likely in the midst of a global breakdown that includes chaotic family relationships, compromised physical and mental health, running away, hospitalizations, trouble with the law, declining or abandoned academic careers and a consistent problematic substance use. Referring agents are faced with varied treatment programs, each with a host of elements that differ on treatment approach, duration, location, family involvement, academic involvement, medical involvement and so on. Without clear specification of what is being treated or evidence of treatment success, what rationale does the referring adult – parent or professional – have to place

faith (and the health of the adolescent) in a program, or to make a choice among programs?

Imagine the variety of responses if the following list were circulated to all professionals who treat these young people, asking the question, “What is being treated in an adolescent struggling with severe substance use?”

- | | |
|---|--|
| <input type="checkbox"/> Drug or alcohol toxicity | <input type="checkbox"/> Substance use disorder |
| <input type="checkbox"/> A bad habit | <input type="checkbox"/> Adolescent-limited addictive behaviour |
| <input type="checkbox"/> Chronic, incurable disease | <input type="checkbox"/> Family dysfunction |
| <input type="checkbox"/> Addiction, a disease marked by relapse | <input type="checkbox"/> Homelessness |
| <input type="checkbox"/> Developmental disruption/immaturity | <input type="checkbox"/> Genetic disease |
| <input type="checkbox"/> Depression | <input type="checkbox"/> Attention-deficit disorder/attention-deficit/hyperactivity disorder |
| <input type="checkbox"/> Anxiety | <input type="checkbox"/> Juvenile delinquency |
| <input type="checkbox"/> Post-traumatic stress disorder/trauma | <input type="checkbox"/> Criminality |
| <input type="checkbox"/> Obsessive compulsive disorder | |
| <input type="checkbox"/> Oppositional defiant disorder | |

Now ask them the question, “What is your mode of treatment?”

- | | |
|---|--|
| <input type="checkbox"/> Detoxification | <input type="checkbox"/> Music therapy |
| <input type="checkbox"/> Breaking bad habits | <input type="checkbox"/> Adventure-based therapy |
| <input type="checkbox"/> Brief intervention | <input type="checkbox"/> Life skills education |
| <input type="checkbox"/> 12-step program | <input type="checkbox"/> Developmental opportunities |
| <input type="checkbox"/> Psychopharmacology | <input type="checkbox"/> Health education |
| <input type="checkbox"/> Substance substitution (e.g., methadone) | <input type="checkbox"/> Academics |
| <input type="checkbox"/> Cognitive behaviour therapy | <input type="checkbox"/> Behaviour modification |
| <input type="checkbox"/> Dialectical behaviour therapy | <input type="checkbox"/> Family therapy |
| <input type="checkbox"/> Psychotherapy | <input type="checkbox"/> Family program |
| <input type="checkbox"/> Psychoanalysis | <input type="checkbox"/> Self-help group, peer mentoring |
| <input type="checkbox"/> Recreation therapy | <input type="checkbox"/> Group therapy |
| <input type="checkbox"/> Art therapy | <input type="checkbox"/> Motivational interviews |

The decision about where to refer an adolescent and family in need of care is difficult to make unless there is a clear conceptualization of the problem to be addressed and reliable information about which method(s) of treatment are most effective for the identified problem. Only with clear conceptualization of the problem can the best mode of treatment be determined. Efforts to shorten wait times will not address issues that arise when adolescents are placed in programs that are not effective in treating an identified problem. Shortening the wait time or smoothing the path from one facility to another through system integration is

not likely to improve the treatment outcome. While access to treatment may be one measure of success for a system, *it is not a sufficient measure of success* when evaluating the effectiveness of mental health treatment from the client or patient perspective.

While access to treatment may be one measure of success for a system, it is not a sufficient measure of success.

Basis for Success

Success is based on defining the problem of what we are treating, defining measures of success (i.e., outcome indicators) and measuring outcomes. Process measures (e.g. number of clients served, how quickly and at what cost) are the only measures that are currently required in Ontario's performance evaluation of mental health care and addiction treatment agencies. These measures serve as predictors and potentially surrogates for ultimate outcome measures. These are the only measures that are currently required in Ontario's performance evaluation of mental health care and addiction treatment agencies. Outcome measures that are patient-centred would include measures of clients' ability to function, their mental health and the robustness of their response to treatment. This article proposes that the most important contribution to improving mental health and substance abuse treatment programs will be achieved by policy and resources that encourage programs to measure their outcomes, evaluate what works and introduce change and innovation that improves treatment outcomes. The case study that follows is based on the experience of only one program, and is offered as an example that we hope will influence other programs to evaluate their outcomes, share knowledge of what works and contribute to the advancement of this field.

An Example from the Field: Pine River Institute

In the past decade, professionals at the Pine River Institute (PRI) have talked to thousands of parents who have hit the wall – parents wondering how they should intervene when their 14-year-old moves in with a drug dealer; when their 17-year-old falls down the stairs dead drunk; when their 16-year-old cuts herself, steals from them and crashes the car; when their 13-year-old flies into a rage at the slightest provocation, and the babysitter says he is dealing drugs from the basement.

The need for more effective services for these adolescents and families was the impetus for establishing PRI, a residential treatment centre developed to respond to the gap in treatment for adolescents struggling with mental health and specifically substance abuse. The challenge to “raise rock bottom” and improve the system of care for these youth led the founders of PRI on an international search for treatment options and literature on best practices. Innovative programs in other juris-

dictions where Canadian youth were being sent by parents who could afford the cost of these private programs were included in the review. By 2001, the Ontario government began to provide financial support to families on a case-by-case basis through the out-of-country program to these same programs. Early on, the founders learned that there is little consensus in Canada on approaches to the problem and its treatment. Canadian “best practice” guidelines drafted in the late 1990s are based on limited literature reviews and consultation (Health Canada 2001). The evidence-based literature in this field remains sparse (Hoagwood et al 2001; Plant and Panzarella 2009).

Extensive research and consultations informed the development of the current PRI model, a multi-component developmental-systemic approach to adolescent substance abuse, where substance use is conceptualized as a symptom of individual and family system challenges that have consequences for healthy development. Additionally, a commitment to outcome evaluation and research was established early on.

The PRI model addresses adolescent substance use problems within the broader context of impaired functioning across multiple domains. Complex interactions among biological (neurodevelopment, genetic vulnerability), psychological (trauma, mental illness, learning disability) and social (family and peer dynamics) domains are seen as contributing to adolescents' impaired functioning, substance use and failure to advance developmentally.

This treatment approach provides a context for accelerated development within which adolescents can increase multiple capacities, including emotional and behavioural regulation, abstract thought, pragmatic future orientation, empathic healthy relationships, individuation and social ethics. Such important developmental achievements facilitate and sustain desired treatment gains including decreased substance use, increased functional living and improved quality of life.

What Are We Treating?

From the beginning, the leaders at PRI have attempted to explicitly define and articulate the core conceptualization and assumptions regarding the focus of treatment. The PRI model is based on the conceptualization of the adolescent as existing within a complex system along a developmental trajectory. The model is based on the assumption that significant problematic substance use and the behaviours often associated with it cause development to essentially “arrest” in many areas of the child's life, including emotional, social, academic (intellectual) and even physical development (consider the impact of poor nutrition, school dropout/disengagement, poor sleep habits, numbing of emotions and failure to engage in healthy relationships). The developmental systemic frame for conceptualizing adolescent substance use is based in part on the works of Drs. John McKinnon and John Santa, clinicians and researchers in

the United States who are encouraging the leaders of American treatment programs to reflect on the assumptions that inform their definitions of successful treatment outcomes (McKinnon 2008 and 2011; Santa 2009).

The PRI model is also informed by neurological research indicating that the brain is plastic and that neurological changes caused by substance use may be part of the explanation about why it is hard to quit an addiction (Doidge 2007). Because recent research has revealed that the brain undergoes a marked period of re-pruning, development and growth during adolescence, the potential impacts of any experiences during those years may have significant effects on the actual structures and functions of the brain (Dahl 2004; Lubman et al. 2007). In fact, due to the accelerated rate of brain development, any impacts (positive or negative) are augmented proportionately to the rate of growth. Thus, although prolonged and chronic substance use will likely have augmented negative effects on brain development, the phenomenon of neuroplasticity coupled with the increased rate of brain development during adolescence means that “healing,” as a result of stopping substance use and improving nutrition and other healthy behaviours, can actually occur (Chambers et al. 2003; Weisz and Hawley 2002).

The phenomenon of neuroplasticity coupled with the increased rate of brain development during adolescence means that “healing” can actually occur.

At the systemic level, substance use is conceptualized as a manifest symptom and maladaptive coping strategy to deal with individual- and systems-level problems. More specifically, substance use is viewed as a strategy being employed by the adolescent to cope with individual-level problems (e.g., depression, trauma, attention-deficit/hyperactivity disorder or other mental illness) and/or dysfunction within the system (e.g., family dysfunction, victimization at school). The many complex factors that exist in the life of adolescents (biology/genes, personality, immediate family, peers, school environment, community, broader social culture and media), including their relationship to the various parts of the system, are considered when formulating individual approaches to treatment.

What Works?

The treatment goal at PRI is to help each adolescent and family identify and address systemic factors that may contribute to the young person’s desire to use substances, while teaching the youth and family alternative ways of coping with the identified problems at both the individual and systems levels. Additionally, because engaging in a lifestyle of problem substance use can result in disrupted and delayed development, adolescents at PRI are

provided with the opportunities they need for “accelerated” development across the spectrum of areas affected (McKinnon 2011).

The PRI approach assumes that accelerated development can best be accomplished through carefully considered therapeutic experiences coupled with guidance from professionals who are trained in promoting child development and dealing with the challenges that these youth face in “catching up.” Treatment for these young people goes beyond relieving symptoms. In other words, in addition to addressing the substance use and underlying issues, these adolescents need opportunities, guidance and time to mature.

Because so little is known about “what works” for these young people, PRI’s core structure was designed to include program and outcome evaluation, with a strong commitment to building a culture of integrated research and practice. An international Research Advisory Committee brings expertise from universities, research centres and other programs, and participation in an international research consortium out of the University of New Hampshire allows for collaborative research.

The process of identifying indicators for treatment success forced leaders at PRI to more clearly and explicitly address the question, what are we treating? PRI treats substance use, individual- and systems-level problems and relative immaturity. The definition of success is based on functional living and quality of life of youth and families who participate in the program. As a result, outcome evaluation is based on a range of functional living and quality-of-life indicators, including substance use, academic status, crisis behaviour, future orientation and family participation, among others.

PRI’s leadership and staff are committed to making a meaningful contribution to the limited research on evidence-based treatment for this population. Process and outcomes are measured on an ongoing basis through careful documentation, reflection and review, and data have been analyzed every six months since the program opened in 2006 (PRI 2010). The PRI treatment model remains dynamic and continues to evolve, responding to the results of the ongoing outcome and process evaluations, and developments in the field, in an effort to answer the question of what works in assisting young people and their families as they transition to healthy adulthood.

Proposed Solutions

Enforce Basic Safety Standards: Licensing and Accreditation

Requiring accreditation by nationally or internationally recognized accreditation agencies would contribute to ensuring a basic level of performance and risk management in child and youth residential treatment programs. Increasingly, these programs demand evidence of “performance quality improvement” and encourage program and outcome evaluation on an ongoing basis. They also require an explicit statement of

treatment models and assumptions. Government's role is not to accredit but to encourage and require accreditation and to provide agency funding to support this process.

Treatment Success Needs to be Based on Constantly Evaluating Goals and Outcomes

The developmental-systemic construct, which goes beyond a narrowly defined medical construct, is not broadly held as a way to think about adolescent mental health and addiction treatment. The recent trend in research funding at the National Institute of Mental Health indicates that there is interest in advancing adolescent mental health research that takes a developmental-systemic approach in a field that currently relies predominantly on outpatient, short-term, symptom-targeted psychiatric and psychopharmacological interventions (NIMH 2008). Treatment success and knowledge about what works can only be based on ongoing outcome evaluation and research that is grounded in a clear definition of what is being treated and the corresponding indicators for success.

Payers and Regulators Should Expect Outcome Evaluation

Recent documents outlining Ontario's 10-year strategy for mental health and addiction articulates the need for promoting accountability at the leadership level (Ministry of Health and Long-Term Care 2010; 2011). Only with reliable treatment outcome studies will payers and regulators (i.e., government) be able to make informed decisions about how best to invest resources toward effective mental health treatment. Additionally, ongoing evaluation of treatment goals and outcomes is the process through which treatment innovations can be transformed into evidence-based practices and policies.

Payers and Regulators Also Need to Understand That This Process Takes Resources

There was no government funding in the initial stages of PRI's development, so private donors and foundations contributed the funds to allow the start-up of a small and innovative operation, including basic evaluation research. Government funding for a pilot project was provided a year after opening, with early results from outcome evaluations indicating that clients were responding to the treatment provided. This pilot funding allowed PRI to build service capacity by making services accessible to a larger number of young people and their families. In addition, the Ontario Centre of Excellence on Child and Youth Mental Health provided some funding and technical assistance to build outcome evaluation capacity. Only with support from the government and community did PRI have the capacity to develop and evaluate an innovative service in Canada. Government must be prepared to dedicate resources to support program evaluation capacity in mental health treatment programs.

Only After Knowing What Works Can We Get into the Business of Dealing with Access Issues

PRI staff have been joined by other Canadian colleagues in an interdisciplinary dialogue among researchers, practitioners and policy makers to deepen the conceptual framework that informs our assessment, intervention and evaluation of adolescents struggling with mental health and addictions (Pine River Institute and The Hospital for Sick Children 2010). What are we treating? How do we measure success? What works? The shared goal is to learn ways to promote the increased uptake of outcome evaluation in adolescent mental health and addiction treatment, and a dialogue has been initiated that includes the Canadian Centre on Substance Abuse, the Ontario Centre of Excellence on Child and Youth Mental Health, SickKids Hospital, the Centre for Addiction and Mental Health, Hincks Dellcrest and PRI. Knowing what works is the necessary foundation for effective solutions to access issues.

The voices of parents, youth, professionals and policy makers are calling for a fundamental change of approach to remedy the critical lack of support for troubled teens who are at risk of not making it to adulthood.

Conclusion

Introducing innovation for a more robust system of care for child and adolescent mental health must be based on a carefully considered conceptual framework. Any responsible interventions in the children's mental health field will be based on this foundation. Taking accountability for articulating our frameworks, identifying what success looks like and measuring the outcomes are the building blocks for system change. Reducing wait times or attempting to create system integration would be the next steps, but not the first. *If you don't know where you are going, any road will take you there.* The voices of parents, youth, professionals and policy makers are calling for a fundamental change of approach to remedy the critical lack of support for troubled teens who are at risk of not making it to adulthood. We are optimistic that the demand for change has become a productive one that calls for accountability and excellence, not just more of the same. And we are heartened when our colleagues in well-established institutions are calling for standards of excellence that will build robust and meaningful system capacity.

The most appropriate role of government in this venture will include ensuring that all treatment programs that they fund are licensed or accredited by a nationally or internationally recognized accreditation organization. While government cannot take on the task of measuring outcomes of the programs and services it funds, it can contribute to building system capacity to define treat-

ment models and outcome indicators and to measure the results. While these fundamental actions are taken for granted in physical medicine, they are not widely practised in child and youth mental health and addiction treatment. Only when we understand what we are doing and how well we are doing will it make sense to tackle system integration and wait times. In the meantime, raising the bar for excellence will save more lives than any process reforms, by addressing the fundamental challenge of defining what we are treating and by evaluating our outcomes. **HQ**

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The RICHER Social Pediatrics Model: Fostering Access and Reducing Inequities in Children's Health

M. Judith Lynam, Lorine Scott, Christine Loock and Sabrina T. Wong

Abstract

Considerable evidence shows that children and families who are vulnerable because of their social and material circumstances shoulder a disproportionate burden of disease and are more likely to face both social and structural challenges in accessing healthcare. Addressing these issues in children is particularly important as evidence has demonstrated that inequities in health are cumulative over the life course.

In this article, the authors report on the RICHER (Responsive, Intersectoral-Interdisciplinary, Child-Community, Health, Education and Research) social pediatrics initiative, which was designed to foster timely access to healthcare across the spectrum from primary care to specialized services for a community of inner-city children who have disproportionately high rates of developmental vulnerability. Their research shows that the initiative has effectively "reformed" health services delivery to provide care in ways that are accessible and responsive to the needs of the population. RICHER is an intersectoral, interdisciplinary outreach initiative that delivers care through the formation of innovative partnerships. The authors share research results that demonstrate that the RICHER model of engagement with children and families not only effectively fosters access for families with multiple forms of disadvantage, but also improves outcomes by empowering parents of particularly vulnerable children to become more active participants in care.

Population studies throughout the world have established links between social and material deprivation and poor health over the life course and drawn attention to conditions that contribute to inequities in children's health (Lloyd et al. 2010; Shonkoff et al. 2009; Stansfeld et al. 2010). Clinicians and researchers have been challenged to identify approaches that are effective in redirecting these children's poor health trajectories.

In recent years, *social pediatrics* has been recognized as an approach that effectively addresses the health needs of children who are vulnerable because of their social and material circumstances (Ford-Jones et al. 2008; Guyda et al. 2006; Julien 2004). We have had an opportunity to research the RICHER (Responsive, Intersectoral-Interdisciplinary, Child-Community, Health, Education and Research) social pediatrics initiative since its inception (Lynam et al. 2008, 2010). The initial conceptual work that informed the development of RICHER incorporated insights from Dr. Gilles Julien's pioneering work, literature on inequities in health, best practices in children's health and research related to the social organization of health services delivery for populations on the social and material margins. Our aim in writing this article is to provide an overview of this initiative and share key research insights.

Why RICHER?

Child development is both an indicator and a determinant of health and is acutely affected by social and material disadvan-

tages. The 2007 provincial mapping of children's development indicated that two thirds of the children in Vancouver's inner city enter school developmentally vulnerable (Kershaw et al. 2005). Vancouver's inner city, which is the host community for the RICHER initiative, remains one the poorest in the country.

Demographic analyses and related research in Vancouver's inner city offer a *family and community profile that reflects multiple axes of disadvantage* and illustrate that the disadvantage is material but also gender and race related. Such social-environmental circumstances are recognized as having the greatest negative impact on children's health trajectories (Lloyd et al. 2010; Stansfeld et al. 2010). It is of particular concern that the health impact of these forms of disadvantage is cumulative over the life course (Hertzman 2009; Power et al. 2007; Shonkoff et al. 2009; Stansfeld et al. 2010).

Developmental delay and poor physical and mental health are the manifestations of health inequities, which are magnified when there are barriers to accessing primary health care (PHC) (Bradshaw 2001; Commission on Social Determinants of Health 2008; Gordon 2003; Marmot et al. 2008; Starfield et al. 2005). However, while "markers" of poor health (e.g., illness, delayed growth and development) lie in the traditional domains of biomedicine, the pathways of influence and, hence, the remedies to effect positive change extend beyond these domains.

Recent studies show that *enhancing social-protective factors*, including creating avenues for accessing developmentally appropriate and socially rich interactions, can improve health and development among children living in poverty (Hall et al. 2009; Lynam et al. 2010; Powers et al. 2009, Shonkoff et al. 2009; Spencer et al. 2005). RICHER seeks to enhance traditional clinical practice approaches by partnering with community organizations to mobilize social supports and create avenues for engagement to foster children's and families' connectedness (Inner City Response Initiative 2011).

Social Organization of Health Services: Integrating PHC with Specialized Services

Health-care systems contribute most to improving health and health equity where the institutions and services are organized around the principle of universal coverage ... and where the system [includes] ... the PHC model of locally organized action across the social determinants of health, and ... entry to care with upward referral.

– Commission on Social Determinants of Health, Closing the Gap in a Generation

The above quotation signals the central role of PHC in health systems and highlights the importance of creating effective structural arrangements between PHC and specialized services. A strong PHC foundation leads to positive population health

outcomes, including increased knowledge about health and care; reduced duration and effects of acute and episodic conditions (Starfield 1998; Starfield et al. 2005; Watson et al. 2004; Wong et al. 2007); and reduced risk and effects of continuing health conditions.

It is of particular concern that the health impact of these forms of disadvantage is cumulative over the life course.

However, where high rates of complex and chronic illnesses and material and social disadvantages occur, different models of PHC are necessary *to ensure access to the full range of health services and care that is responsive* (Health Officers Council of British Columbia 2008; Lynam et al. 2010; Public Health Agency of Canada 2008; Smith et al. 2006). For example, a central, yet often-unexamined assumption of PHC is that families will have the knowledge, skills and resources to navigate the healthcare system, to follow through on referrals, to enact recommended treatments and/or to clearly present their concerns about their child to healthcare providers in order to initiate treatment. Our experience and research shows, however, that for families with multiple forms of disadvantage, including being isolated or marginalized, such assumptions are not borne out (Carbone et al. 2004; Dixon-Woods et al. 2006; Moore 2009; Pauly et al. 2009). As such, additional considerations for PHC also include the mobilization of supports for such families to engage with clinicians.

Moreover, health services are typically organized into programs by medical specialty, age group or geographical region, which leads to fragmented policies and practices, with complex and confusing points of entry. "At risk" children may need services from multiple sectors and through several developmental stages; to be responsive, fragmentation must be addressed (Baum et al. 2009). It is increasingly evident that because of the complex and varied healthcare needs of these children and families, *clinical programs must be linked with services across the continuum of care*, from access to community-based networks and sources of support to specialized healthcare services (Lynam et al. 2008, 2010; Wong et al. 2010).

The complexities of access are further compounded by families' social circumstances and clinicians' responses to them. Our own and others' research has shown that families on the social margins often feel "pre-judged" (Lynam et al. 2010) and must frequently confront often-unfounded assumptions others hold about them (Carrillo et al. 2011; Dixon-Woods et al. 2006; Reutter et al. 2009). Clinicians need to be mindful of the ways social context influences families' experiences. For example, in our community, many children in Aboriginal families are coping with the legacy of policies that have eroded the capacities for family and community support of children. Similarly,

many families are led by single mothers, many of whom have themselves been subject to multiple risks and trauma over their lifetime. Legacies such as these not only create fragile living conditions for many children, they also continue to play out in the context of healthcare encounters.

While “markers” of poor health lie in the traditional domains of biomedicine, the pathways of influence and, hence, the remedies to effect positive change extend beyond these domains.

In recognition of these challenges, RICHER has created new structural arrangements to facilitate access and to mobilize the range of resources needed to support families in fostering development and managing their child’s health condition.

RICHER Clinical Program and Research

RICHER is a unique collaboration between the formal and informal sectors. In our case, it is an interdisciplinary and intersectoral collaboration between a tertiary care facility, primary care, public health and community organizations. The initiative began providing clinical services to complement existing public health and primary care programs in 2008 after extensive consultation and engagement with community groups and health services providers. The clinical team developed a partnership agreement with community-based organizations and created structures that have enabled ongoing dialogue as services have developed.

In the RICHER *clinical program*, nurse practitioners are the primary care clinicians. The complexity of the children’s health needs necessitated that the initial outreach of general pediatrics and the sub-specialized services of developmental pediatrics be augmented. In 2010, the Specialized Pediatric Outreach Consultation for Kids (“SPOCK”) component of the program developed. Unique to the RICHER model, clinicians (primary care and specialists) enact their practice directly in the community venues identified by the community providers as safe and trusted places where families naturally congregate. For example, clinics are held in daycares, schools, community centres and non-profit family support agencies. As well, the referral process is barrier free and is made directly through a parent, child care worker, public health nurse, community support worker, family doctor or others. Assessments may be booked in the “traditional manner,” but many families “drop in” and receive the care they require. All clinicians – primary care through sub-specialist – connect with each other directly daily or weekly regarding the provision of care in ways that work for the family. In addition, the clinical team meets weekly with representatives from the community agencies, at the “community table,” to work together on issues the commu-

nity has identified as affecting the health of the community. A key component of clinicians’ therapeutic recommendations is connecting parents and families to supportive environments, building parental capacity and using grassroots community programs to augment traditional healthcare interventions in addressing the developmental needs of children.

The *research* on RICHER is informed by critical theoretical perspectives and employs a community-based participatory approach (Ponic et al. 2010; Wallerstein et al. 2010). This approach is characterized by ongoing dialogue and engagement with the constituents of the research to ensure questions of relevance are asked and methods employed to examine them are respectful of the community. Over the past five years, we have had extensive participation by families, clinicians, community key informants and representatives of community-based organizations. Early in our discussions, it became clear that the children and families we wanted to learn from had considerable, often negative, experiences, of being “under surveillance” by different state agencies and community organizations. The community was particularly hesitant to engage in research that “took information away” and did not necessarily give anything back that they viewed to be of value. We were therefore challenged to ensure that the processes of engagement to undertake our research evolved out of community consultation and that our practices were respectful.

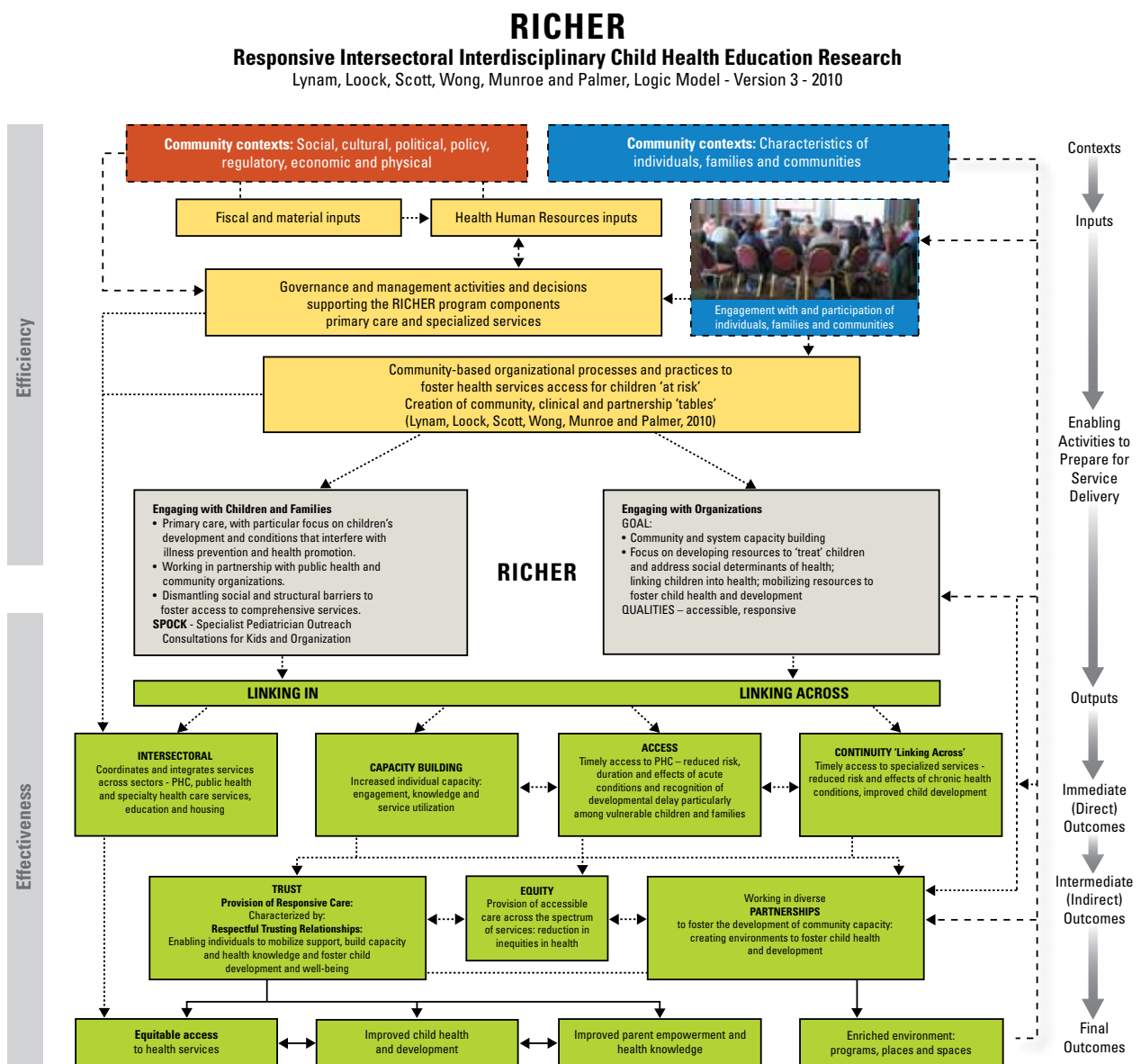
Through our ongoing research on RICHER, we have gathered qualitative data to identify both social and structural barriers to healthcare access and to explicate the organizational processes and practices that have fostered access to healthcare services and supported clinicians’ engagement with the community (Lynam et al. 2010). As access is strongly linked with positive health outcomes, in 2010 we administered a self-report survey to a significant proportion of families receiving clinical services from RICHER. The purposes of the survey were to assess if the program was reaching the target population and to consider parents’ experiences of PHC. The survey incorporated standardized measures that reflected important dimensions of PHC, including accessibility, continuity (informational, relationship, and management continuity), interpersonal communication, patient activation and patient empowerment. Patient activation and empowerment are of particular interest because they are associated with better illness management and appropriate health services utilization.

In addition to identifying barriers to healthcare access, our data have enabled us to illustrate ways the clinicians have engaged to dismantle such access barriers and ways health services have been “re-formed” to be more responsive to the needs of these children and their families (Lynam et al. 2010). As the initiative evolved and data were gathered, we iteratively conceptualized the RICHER logic model (Figure 1), which builds upon Watson and colleagues’ (2009) model of PHC.

The model provides a conceptual map of the processes, practices and outcomes we have mapped and have demonstrated through our research. In particular, it illustrates the importance of administrative and leadership support for the implementation of the practice, and positions the community table as a key component of the RICHER organizational structure because it

creates an avenue for ongoing engagement with the initiative as it continues to evolve. The model seeks to illustrate the nature of the clinicians' practice and patient outcomes. Analyses of our survey data show that the *RICHER approach does foster access* to primary healthcare for children and families facing significant poverty and multiple forms of social and material vulnerability,

FIGURE 1.
The RICHER logic model



PHC = primary health care.

including family instability and housing and food insecurity (Wong et al. 2010, 2011). Moreover, the children accessing RICHER clinical programs have considerably higher rates of complex health conditions and developmental challenges than would be expected in a typical population. Early results also suggest that parents' positive appraisal of the quality of their relationship with the primary care clinicians (nurse practitioners) is strongly associated with parents' positive assessment of (1) the knowledge they have acquired about their child's health condition, (2) their (improved) capacity to manage their child's health condition and (3) their ability to mobilize the resources needed to support their child (Wong et al. 2011).

“The RICHER approach does foster access to primary healthcare for children and families facing significant poverty and multiple forms of social and material vulnerability.”

Summary

In enacting RICHER, clinicians have sought to recognize the social roots of inequities in the ways relationships are constituted and in the nature of resources mobilized to respond to the complex (mental, physical and developmental) health challenges of vulnerable children and families. In many ways, RICHER began as a best practices approach, drawing upon research insights from a number of disciplinary perspectives while also working collaboratively, and within, existing organizational structures to complement, extend and enrich existing primary and specialized services.

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The research that has been cited in this manuscript was funded by grants from the Canadian Institutes of Health Research and the Michael Smith Foundation for Health Research. Our community partners have played an integral role in the design and delivery of the initiative. In particular, we acknowledge Ray Cam Community Co-operative, the Network of Inner City Community Service Societies and the Network of East Vancouver Community Organizations, which includes Vancouver Native Health and the YWCA. We acknowledge the leadership and support of BC Children's Hospital of the Provincial Health Services Authority, particularly the support of B. Fitzsimmons and B. Palmer, who along with V. Munroe, of Vancouver Coastal Health, have engaged with us as decision-making partners on our research. **HQ**

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Hospital-Based Inter-professional Strategy to Reduce In-patient Admissions and Emergency Department Visits for Pediatric Asthma

Karen Fleming, Brian Kuzik and Chee Chen

Abstract

Pediatric asthma is a common reason for emergency department (ED) visits and in-patient hospital admissions. Evidence demonstrates that asthma management initiated in the ED has limited benefit unless followed by ongoing coordinated inter-professional care (IPC). The Royal Victoria Hospital (RVH) of Barrie, Ontario, has developed a best practice model of care for pediatric asthma. Primary care providers and ED physicians are actively encouraged to refer children with any recurrent respiratory problems consistent with asthma to the Paediatric Asthma Clinic (PAC). Quarterly PAC visits with a certified asthma educator and a pediatrician include lung function measurement, written action plans and primary care provider communication. Ongoing outcome monitoring of patients receiving IPC has revealed that, compared with 12 months prior to enrolment in the PAC, patients show a two-thirds decrease in asthma-related ED visits and an 85% decrease in admissions. The PAC has contributed to an ongoing decline in the rates of pediatric asthma-related ED visits and admissions at RVH, which are currently less than half the rates seen at our peer hospitals.

IPC for chronic diseases is best practice, and our model of care for pediatric asthma continues to provide critical data demonstrating and supporting the advantages of IPC in chronic disease management. RVH modifies practice and policy to meet best practices, optimizing the care provided to children with pediatric asthma.

Inter-professional care (IPC) has been defined in Ontario through the HealthForceOntario Inter-professional Care Steering Committee as “the provision of comprehensive health services to patients by multiple health caregivers who work collaboratively to deliver quality care within and across settings” (Closson and Oandasan 2007: 7). The significance and overall system impact of IPC in Ontario is not a new phenomenon in healthcare. Many teams, such as palliative care and critical care teams, have been functioning with this model of care for years because they recognize the benefits associated with it. These benefits include increased access to healthcare, less tension and conflict among caregivers, a better use of clinical resources and improved recruitment and retention (Closson and Oandasan 2007). In addition, previous research demonstrates that IPC improves outcomes for people with chronic diseases (Closson and Oandasan 2007).

Asthma is a leading chronic illness among Canadian children (Chan et al. 2009; Cope et al. 2009; Garner and Kohen 2008; Simons et al. 2011). The Paediatric Asthma Clinic (PAC) at the Royal Victoria Hospital (RVH) of Barrie, Ontario, has been in operation for over 15 years, with a number of pediatricians and certified asthma educators holding clinics in various locations throughout the hospital. Through a process of attrition and strategic reorganization, the PAC has evolved into a cohesive clinic with a stabilized inter-professional team, with all of its activity relocated into the well-appointed Children’s Outpatient Clinic.

Canada has a proud history in standardizing pediatric asthma care; in 2003, it was the first country to develop pediatric asthma guidelines (Cope et al. 2009). The PAC at RVH provides treatment according to the Canadian Paediatric Asthma Consensus Guidelines (Becker et al. 2005), including ongoing monitoring of outcomes. The inter-professional, evidence-based approach of the clinic is recognized as a cost-effective and efficient means of managing pediatric asthma and is based upon the Primary Care Asthma Program (PCAP; To et al. 2008). The PCAP was developed subsequent to an Ontario eight-site provincial pilot

The benefits of IPC include increased access to healthcare, less tension and conflict among caregivers, a better use of clinical resources and improved recruitment and retention.

project evaluating asthma management protocols and associated outcomes. It was funded by the Ministry of Health and Long-Term Care, starting in 2002. The Primary Care Asthma Care Pilot Project developed a number of tools and resources based on the Canadian Asthma Consensus Guidelines (The Lung Association of Ontario n.d.). Although RVH was not involved in the pilot project, it is currently a recognized PCAP site.

At the RVH clinic, each child and family is first seen by a certified asthma educator who reviews all aspects of asthma management based upon the most recently published evidence. If the child is a new patient to the PAC, the patient and families are given a brief orientation to the clinic including the following:

- A description of the team members and their role and function within the clinic
- Reassurance that the patient and the family are an active and engaged part of the healthcare team
- A summary of what will occur during each visit: (1) a review of the inhalation technique; (2) a review of all aspects of respiratory care at home, including adherence or changes to the written action plan developed at the previous visit; and (3) a review of environmental control and allergen avoidance
- Information about the collaborative development of a written action plan to be provided to the family at the conclusion of every visit, and a written note to be sent to the primary care provider after each clinic visit

A respiratory assessment of the child, including valuable subjective and historical information from the patient and family, is conducted by both the asthma educator and the pediatrician. Spirometry pre- and post-bronchodilator is completed on all children over the age of five or six years and, more recently,

is combined with exhaled nitric oxide testing in select patients. Following these evaluations, the patient is seen by the pediatrician (in the presence of the asthma educator) and action plans are developed and adjusted if needed. The asthma educator then meets with the family once again to reinforce the written action plan and provide a follow-up appointment. A written summary of each visit is sent to the primary care provider as it is the intention that patients will return to the care of their primary care provider once they are stable and an effective care plan is in place.

Our Patient Population

RVH, a 269-bed community hospital, is the only acute care hospital in Barrie and has an estimated primary service population of 230,000 (all ages). Detailed patient demographic data for the PAC at RVH has only been available since 2008 and is summarized in Table 1. We currently follow up more than 400 patients (under age 18 years). The patient mix has remained consistent, with one half under the age of six and approximately 20% without a primary care provider. Patients are followed up quarterly and discharged to their primary care provider when stable. Interim care is provided by the primary care provider, who receives a written report from each PAC encounter. Patients without a primary care provider are followed up indefinitely, but limited clinic resources means that these patients often rely on the emergency department (ED) or walk-in clinics for interim care.

Patients are seen in the PAC by referral only, with the majority of referrals coming from the private practices of local community physicians, who receive an annual reminder of our services. Preschool children may have several different wheezing phenotypes that can account for significant morbidity without a clear diagnostic label of asthma (Brand et al. 2008). Local physicians are therefore encouraged to refer any child with recurring respiratory issues, regardless of age or whether or not there is a diagnosis of asthma. Similarly, children presenting to our ED with symptoms consistent with asthma but without a formal diagnosis are considered to be vulnerable, and we actively encourage the ED physicians to refer these children to the PAC. To support this effort, we routinely post signs in strategic areas of the ED to remind physicians of our services. This strategy has been moderately successful, with a 59% increase in ED referrals in 2010; but the total number of ED patients referred still represents less than one fifth of all children presenting to the ED with wheezing issues.

Impact of PAC

A significant component of the IPC approach in our PAC includes active recruitment of vulnerable patients as well as a strong emphasis on patient and family education. These have been very effective in reducing the burden of asthma in our community, with the associated reductions in healthcare expenditures.

As one of the primary goals of good pediatric asthma control is

TABLE 1.
Patient activity the RVH PAC

	2006*	2007†	2008‡	2009‡	2010‡
Pediatricians	4	4	2	2	2
Asthma educators			4	5	6
Patient visits	838	640	568	664	858
Total individual patients			298	342	415
Current active patients at year's end			248	380	415
Age 0–2 years			11%	19%	13%
Age 2.1–6 years			42%	45%	41%
Age >6 years			46%	36%	46%
Patients without primary care provider			20%	26%	22%
New referrals			195	224	232
Source of new referrals:‡					
• ED			17%	17%	26%
• Community family doctors			62%	49%	35%
• Community pediatricians			–	19%	16%
• In-patient discharge			4%	7%	8%
• Walk-in clinics			8%	5%	4%
• Other			9%	3%	11%
ED (pediatrics)					
Total visits related to asthma†	747	542	575	426	382
• Age 0–5 years			67%	59%	68%
• Age 6–10 years			12%	15%	14%
• Age >10 years			21%	26%	18%
% of total pediatric ED visits that were due to asthma †	4.2%	3.4%	3.8%	2.7%	2.6%
Total unique patients			502	374	330
Referred to PAC			33	38	61
Admissions to RVH for asthma‡ (pediatrics)	154	98	108	62	86

ED = emergency department; PAC = Paediatric Asthma Clinic; RVH = Royal Victoria Hospital.

Sources of data (detailed patient demographic data for the PAC at RVH has only been available since 2008):

*Dr. G. Rogan, 2006, Adult and Pediatric Asthma Education and Support Service Overview, RVH (internal document, personal communication).

†Paula Ritchie, ongoing clinic data collection.

‡Decision Support Services, RVH; Canadian Institute for Health Information/RVH – Cactus Discharge Abstract Database and National Ambulatory Care Reporting System, which includes J45.0 to J45.91 Asthma/RAD/bronchospasm; J21.0 to J21.9 RSV bronchiolitis, acute bronchiolitis; R06.2 wheezing; J40 bronchitis; and J20.0 to J20.9 acute bronchitis.

TABLE 2.
PAC patient outcome audit*

Fiscal Year	ED Visits Due to Asthma			Admissions Due to Asthma		
	Pre-PAC	Post-PAC	% Decrease	Pre-PAC	Post-PAC	% Decrease
2006–2007	199	63	68	41	8	80
2007–2008	151	57	62	41	4	90
2008–2009	108	32	70	7	1	86

ED = emergency department; PAC = Paediatric Asthma Clinic; RVH = Royal Victoria Hospital.

*Comparison of asthma-related activity for new PAC patients in the 12-month period immediately pre- and post-initial clinic visit.

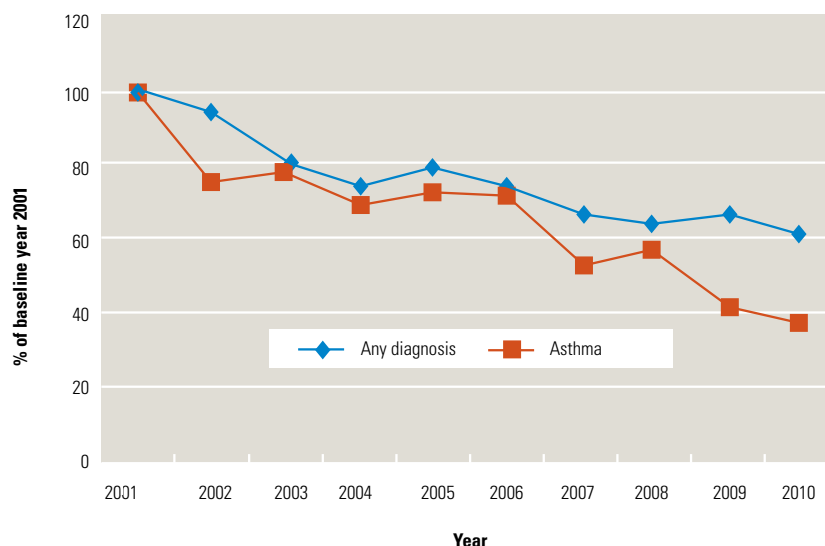
Source: Decision Support Services, RVH; Meditech, Canadian Institute for Health Information/RVH – Cactus Discharge Abstract Database and National Ambulatory Care Reporting System.

to provide caregivers with the tools to safely and effectively manage exacerbations without the need for visits to the ED (Becker et al. 2005), it follows that ED visits for asthma may often represent a failure of outpatient management (Guilbert et al. 2011). For the fiscal years 2006–2009, we completed a patient outcome audit that compared the frequency of asthma-related ED visits in PAC patients over the one-year period immediately prior to and following their enrolment into the PAC (Table 2). With each patient acting as his or her own control, we have consistently demonstrated that enrolment in the PAC is associated with an average 67% decrease in ED visits for asthma in the first year following enrolment. During this three-year period, the total pediatric ED visits at our hospital that were due to asthma fell from 4.2% to 2.7% (see Table 1). This contrasts our peer hospitals in Ontario, which, over the same three-year period, demonstrated a relatively static and three-fold higher rate of 7.9% of pediatric ED visits being due to asthma (according to data from the Canadian Institute for Health Information [Provincial Council for Maternal and Child Health 2010]).

In addition, over the past decade at RVH, there has been a steady decline in pediatric ED visits for all diagnoses, but the decline in asthma-related activity has been consistently greater (Figure 1). We are unable to confirm whether this decline in asthma-related ED patient visits was due to patients attending elsewhere for acute care. This seems unlikely, however, as the patient outcome audit demonstrated that these patients had already established a pattern of attendance at RVH, which is the only acute care hospital in the

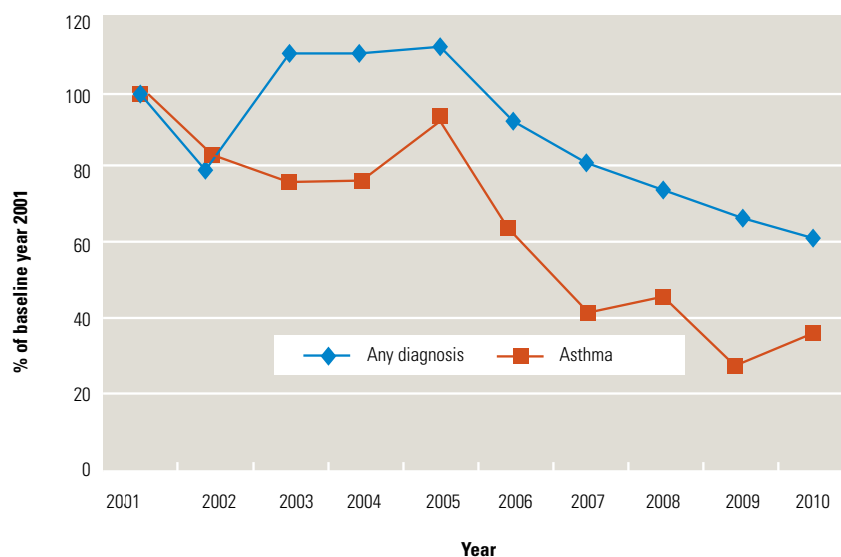
city – the EDs of neighbouring communities are 30–90 minutes' drive from Barrie. It is therefore proposed that the impact of the PAC has significantly contributed to the observed reduction in

FIGURE 1.
Trends in pediatric emergency department visits at Royal Victoria Hospital



Source: Decision Support Services, RVH; Meditech, Canadian Institute for Health Information/RVH – Cactus Discharge Abstract Database and National Ambulatory Care Reporting System.

FIGURE 2.
Trends in pediatric admissions to Royal Victoria Hospital



Source: Decision Support Services, RVH; Meditech, Canadian Institute for Health Information/RVH – Cactus Discharge Abstract Database and National Ambulatory Care Reporting System.

the burden of pediatric asthma-related visits in our ED.

Similarly, admissions to hospital for treatment of pediatric asthma often represent a failure of ongoing outpatient management (Guilbert et al. 2011). The patient outcome audit also demonstrated that for fiscal years 2006–2009, children enrolled in PAC care at our hospital demonstrated an average 85% decrease in asthma-related hospital admissions in the year following enrolment (see Table 2). In addition, over the past decade asthma-related pediatric admissions at our hospital continued to decline faster than admissions for all other reasons combined (Figure 2). In fiscal year 2009–2010, the percentage of pediatric hospital admissions at RVH that were asthma-related was less than one half of the provincial average for our peer hospitals (Provincial Council for Maternal and Child Health 2010). By the same reasoning as noted above, we cannot confirm but it seems likely that asthma patients were not simply being admitted elsewhere for acute care. It is therefore once again proposed that the impact of the PAC has significantly contributed to the observed reduction in the burden of pediatric asthma-related admissions at our hospital.

We have consistently demonstrated that enrolment in the PAC is associated with an average 67% decrease in ED visits for asthma in the first year following enrolment.

Conclusion

Our data demonstrate that through an IPC model of care in which best practices are employed, ED visits and in-patient admissions for pediatric asthma-related illness decrease. These outcomes support previous research and literature in demonstrating the benefits of an IPC model of care in managing chronic illness. **HQ**

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Enhancing Cultural Competence for Improved Access to Quality Care

Karima Karmali, Linda Grobovsky, Jennifer Levy and Margaret Keatings

Abstract

The Hospital for Sick Children (SickKids) is situated in one of the most diverse cities in the world. This is reflected in the patient population it serves. In 2009, the hospital embarked on a quality improvement initiative to address the existing evidence base on health disparities and to enhance health equity through cultural competence programming. The goal was to achieve optimal health outcomes for all patients and families, with a particular focus on new immigrant and other vulnerable populations. Evaluation results indicate changes in clinical practice as a result of this initiative and increased patient satisfaction with regard to staff members' level of cultural sensitivity. This article provides an overview of this hospital-wide initiative, as well as the evaluation methods and outcomes. Based on a needs assessment, we developed an institutionally meaningful curriculum with SickKids' values of family-centred care, patient safety and service excellence embedded in the program. Educational sessions were delivered to clinical and non-clinical hospital staff, focusing on health disparities, the case for culturally competent care and practical tools for healthcare practitioners. Organizational change strategies, including the use of champions as change agents and role models, were used to embed cultural competence as integral to family-centred care at SickKids.

Setting the Context

Canada receives more than 200,000 immigrants every year, which accounts for around 60% of the population growth (Ng et al. 2005). In the past few decades, there has been a pronounced change in immigration trends, with a significant shift in source countries from European to non-European. Table 1 provides an overview of the magnitude of this shift.

Toronto, Ontario, is one of the most diverse cities in the world, with a majority of immigrants hailing from visible minority communities. According to the *Employment Equity Act*, "members of visible minorities" are those, other than Aboriginal peoples, who are non-white in colour and non-Caucasian in race (Department of Justice 1995). Forty-seven percent of Torontonians identify themselves as belonging to a visible minority community (City of Toronto 2011). The five largest visible minority immigrant groups are Chinese, South Asians, Blacks, Filipinos and Latin Americans (Statistics Canada 2008b). Research has shown that Canada's newest settlers are subject to health disparities and health inequities (Beiser and Stewart 2005; Villeneuve 2002). Evidence indicates that quality of care can be compromised when healthcare providers do not respond appropriately to language and cultural factors impacting health and health behaviour (Green et al. 2002; Kirmayer 2006). Culture influences concepts of health and illness, symptoms of distress

TABLE 1.
Place of birth by region of immigrants to Canada

Region	Before 1961 (%)	2001–2006 (%)
United States	3.9	3.5
Europe	90.5	16.1
Asia	3.2	58.3
Africa	0.5	10.6
Caribbean and Central and South Americas	1.4	10.8
Oceania and other countries	0.4	0.7

Source: Statistics Canada (2007).

and help-seeking behaviour (Ivanov and Buck 2002; Kirmayer and Looper 2006). Healthcare professionals and organizations need to work with this understanding to provide appropriate care to diverse communities. Patient- and family-centred care, which is central to the mission of healthcare organizations such as The Hospital for Sick Children (SickKids), can be optimally realized only if the needs of diverse families are addressed in an equitable manner. In the field of child health, factors that are influenced by culture, such as parenting practices, decision-making with regards to child health and bereavement practices of families, require specific attention. Cultural competence is therefore critical to providing quality, safe and family-centred care.

It is increasingly evident that the provision of quality care in the context of diversity is a complex issue that requires additional effort. The system and services put in place when healthcare organizations were established were Eurocentric in nature – designed to cater to a very different population demographic than the present one. The dominant culture orientation of healthcare professionals also acts as an impediment to responsive care for diverse populations (Hussain 2006). The vision of healthcare organizations that strive toward optimal health outcomes for all necessitates a movement from “equality in services” to “equity in services,” a movement that embraces the concept of cultural competence as integral to responsive service delivery in multicultural contexts.

Cultural Competence

The seminal definition as proposed by Cross et al. states that *cultural competence* is “a set of congruent behaviours, attitudes, and policies that come together in a system, agency, and among professionals, and enables ... [them] to work effectively in cross-cultural situations” (1989: 4). A more recent definition underscores that cultural competence is the capacity to function effectively as an individual and an organization within the context of the cultural

beliefs, behaviours and needs presented by consumers and their communities (US Department of Health and Human Services [USDHHS], Office of Minority Health 2005).

Internationally, the need for cultural competence in health-care is garnering increasing attention and leading to specific action. The United States, for example, has implemented the National Standards on Culturally and Linguistically Appropriate Services in Health Care (USDHHS, Office of Minority Health 2001).

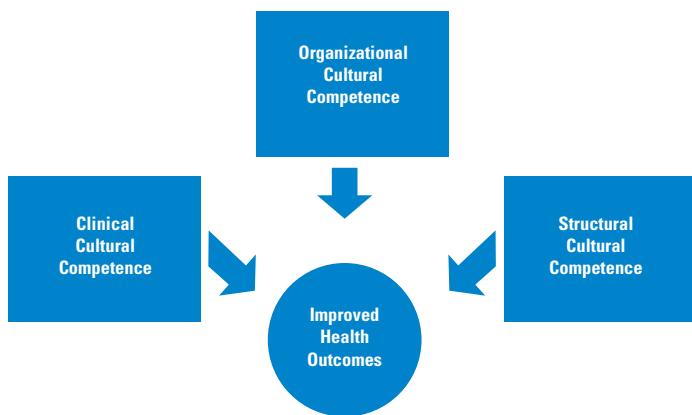
Australia has developed the National Cultural Competency Tool for Mental Health Services, which contains a set of National Cultural Competency Standards and a range of practical aids and strategies, including tools for organizational assessment (Multicultural Mental Health Australia 2011).

The Initiative

Located in the heart of downtown Toronto, SickKids is the largest pediatric academic health sciences centre in Canada, providing tertiary and quaternary care to the sickest and most vulnerable children provincially, nationally and internationally. It champions the development of an accessible, comprehensive, responsive and sustainable child health system that is centred on core values of family-centred and compassionate care. Situated in one of the most diverse cities in the world, it serves a highly multicultural patient population and provides interpretation services in more than 50 languages. Annually, there are over 50,000 emergency department visits, 200,000 visits to the outpatient clinics and 14,000 in-patient stays. Health equity is a key priority for SickKids, and the cultural competence initiative is reflective of this priority.

This article highlights the holistic approach to cultural competence employed by SickKids that enables the integration of organizational, clinical and structural-level cultural competence, leading to sustainable outcomes. The model employed is adapted from an existing practice framework of cultural competence (Betancourt et al. 2003). An education strategy, undertaken as part of the larger cultural competence initiative, is used to expand on the application of the adapted model. While the primary objective of the initiative was to increase cultural competence of staff to improve quality of care, the initiative was implemented with the understanding that change cannot happen in isolation. Therefore, there were many elements beyond education that informed the initiative (Figure 1).

FIGURE 1.
Cultural competence framework



Source: Adapted from Betancourt et al. (2003).

Organizational Cultural Competence

Organizational cultural competence is reflected in policies, practices and structures that enhance work efficiency in cross-cultural situations; it requires the organization to value and adapt to diversity, manage the dynamics of differences and institutionalize cultural knowledge (Olavarria et al. 2005). At SickKids, investing in diversity initiatives, implementing policy- and program-level changes, articulating a clear need for cultural competence to enhance health equity and creating an environment conducive to new learning, have demonstrated an organizational commitment to promoting quality and safe care through culturally competent care.

The New Immigrant Support Network (NISN) was established at SickKids through funding received from Citizenship and Immigration Canada in April 2009, with the aim of improving access to quality healthcare and health information for newcomers via the provision of cultural competence education to healthcare providers and through the translation of patient education materials in up to nine languages. NISN partnered with multiple stakeholders and departments and worked closely with members of the senior management team to enact this vision. The foresight of the organization in creating an exclusive vehicle to power the initiative provided the opportunity to allocate dedicated time, resources and expertise; this is much needed in healthcare environments where staff resources are always challenged due to direct service delivery pressures. The approach of NISN was to drive the process, to build capacity within the organization and individual departments in such a manner that cultural competence has become an integral element in the provision of family-centred care. The organization signalled to its staff and stakeholders that cultural compe-

tence is a high priority by having a member of the senior management team champion the initiative and by allowing protected time for staff from different departments to attend the cultural competence education and training.

Clinical Cultural Competence

Culture plays a significant role in the interaction between patients and families and their healthcare providers. The cultural competence education program is based on the premise that understanding and providing culturally competent care is a strategy to reduce health disparities and enhance health outcomes of many cultural groups (Canadian Nurses Association 2004). It focused on developing a cultural competence curriculum and delivering workshops at multiple levels to clinicians and other hospital staff who have contact with children and their families. While in many cases the education

in itself is an end, rather than a means, putting into question the purpose and the long-term impact of such initiatives, this program chose to clearly outline the goals that the education program was set to achieve: to enable clinicians and other staff to provide culturally competent care and services; to conduct appropriate clinical assessments of newcomer patients' and families' healthcare needs; and to improve newcomer patient access to culturally competent care within the organization.

The development of the curriculum started with an organizational needs-assessment process that helped align the approach to cultural competence within a framework that reflected the core values of the organization and made it locally meaningful. This was followed by needs-assessment focus group discussions with staff to facilitate designing a curriculum that was relevant to participants' needs, challenges, experience and practice. These focus groups also served the purpose of engaging the staff and creating an interest in the area of cultural competence. Based on these consultations, cultural competence learning modules were individually tailored for different staff groups: clinical staff, non-clinicians, service staff and managers. In all, 173 workshops were delivered and reached over 2,100 staff. The workshops ranged from four-hour sessions for non-clinical staff to two-day events for clinical staff. The learning strategy – using standardized patients, a method involving role play in which professional actors play the part of patients and their families and interact with staff in simulated scenarios – was designed to reinforce the concepts presented in the sessions by putting them into practice in a simulated and safe environment.

Structural Cultural Competence

Structural cultural competence can be defined as the changes

to systems and processes within an organization that enhance its capacity to function in a culturally competent manner. A number of projects focusing on structural cultural competence were implemented through this initiative. One key project focused on the placement and implementation of 12 kiosks that provide in multiple languages and directions to help patients and families find their way around the hospital. Additionally, as part of a six-month pilot project, the patient satisfaction survey was translated into seven languages and used to survey families

The organization signalled that cultural competence is a high priority by having a member of the senior management team champion the initiative and by allowing protected time for staff to attend the education and training.

identified during their hospital visit as having limited English proficiency. The results of these surveys will be valuable in determining how effectively the hospital meets the needs of this population and in implementing quality improvement plans to address any gaps.

Research indicates that language barriers have a detrimental impact on the quality of care and patient safety. Through the cultural competence initiative, systems and tools have been put in place to enhance the awareness of, and access to, existing face-to-face and telephone interpretation services. The education workshop promoted the use of a cultural assessment tool that increased clinician sensitivity to the language needs of children and their families, thereby encouraging the use of interpreter services in a timely and responsive manner. This has resulted in a significant increase in the use of interpreter services.

The cultural competence workshop for managers addressed program-level factors, such as access, engagement, and outreach, that program managers need to consider while tailoring their programs to respond to the needs of a multicultural patient population.

Finally, the establishment of a Champions Program was instrumental in the dissemination of information related to the cultural competence activities being imple-

mented. About 100 cultural competence champions representing various clinical and non-clinical areas across the hospital received advanced education in cultural competence and acted as change agents and role models in the delivery of culturally competent care and service.

Evaluation

A comprehensive, multi-pronged evaluation strategy was used to determine the effectiveness of the cultural competence initiative. This section focuses specifically on some of the evaluation activities related to the education initiative.

A head count determining discipline- and department-specific participation in the workshops was important in ascertaining weak spots and resistance within the organization toward the initiated change. Over 2,100 hospital staff – primarily clinicians – attended the workshops. The activity evaluating commitment to change entailed asking participants to record three things that they would do differently as a result of having attended the workshop. This activity is an education intervention as it has been shown to promote behaviour change (White et al. 2004) and is also a means of evaluating intended and actual change following an intervention. About 800 workshop participants completed the commitment-to-change activity, and 2,542 commitments were documented. In analysis, the congruence between the workshop objectives and commitments that participants made were assessed and grouped by theme. Key themes included practice change, belief or attitude change and continuing education related to culture and culturally competent care. Fifty-four participants were followed up and interviewed three months following the workshops about their challenges and successes in carrying out their commit-

FIGURE 2.
Face-to-face interpretation requests

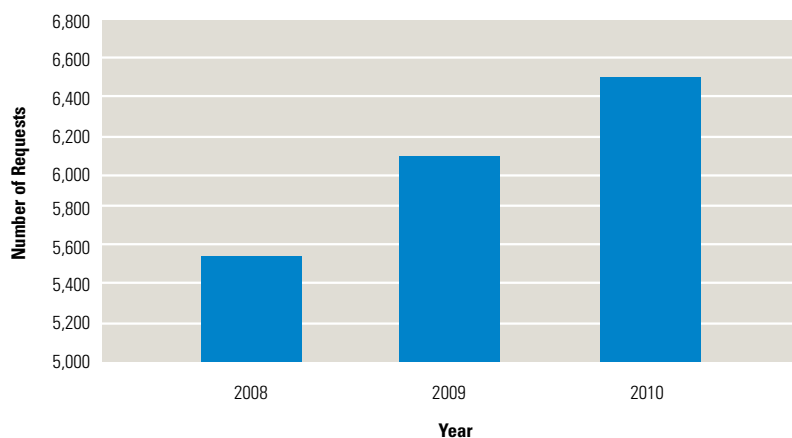
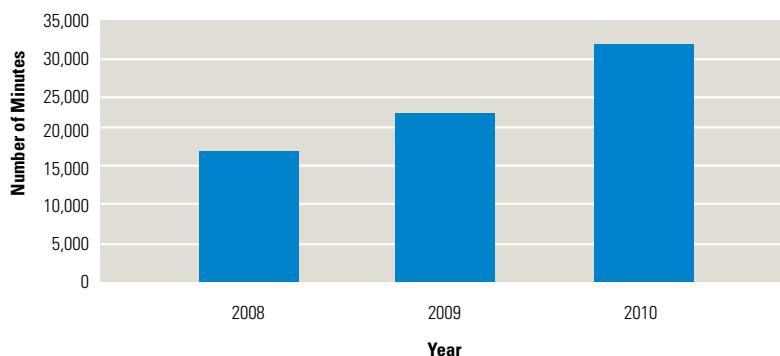


FIGURE 3.
Minutes of telephone interpretation use



ments. Seventy-eight percent of commitments documented by these participants had been achieved, and participants indicated intent to act on another 16% of commitments.

Change in interpreter service use (Figures 2 and 3) was measured as an indicator of practice change. Results show a significant increase in the use of face-to-face interpretation and a doubling of the number of minutes of telephone interpretation use since the implementation of the cultural competence education workshops.

Finally, a review of the patient satisfaction survey results validates practice changes and enhancements in culturally competent care. Results indicate a more than 5% increase in satisfaction to the question, “Were hospital staff members sensitive to your (your child’s) special cultural needs or concerns?”

Sustainability

The linkages between organizational, clinical and structural aspects of a system protect an endeavour from the threats of temporality of stand-alone initiatives and embed them into the core of the vision and function of the organization and its staff, as evidenced in the cultural competence initiative. The creation of the cultural competence champion role and the outcomes of the commitment-to-change evaluation activity are but two indicators of sustainable change. The development of the Cultural Competence Series of e-learning modules and an educational film on cultural competence provide an ongoing platform of learning. Finally, the recent establishment of a portfolio with a mandate to focus on health equity will further ensure sustainable change.

Dissemination

In order to more broadly impact the child health system in the province, the lessons learned and the resources developed through the cultural competence initiative are being shared with

other healthcare organizations across Ontario. Two-day train-the-trainer workshops were offered and were attended by over 100 participants representing 45 organizations. The workshop and the training manual were designed to orient educators and leaders to specific considerations in the development, implementation and evaluation of a cultural competence program. The sessions included information on resources available, including the patient education materials and child health information translated into various languages and made available online. Evaluation of these sessions revealed that partici-

pants intended to take the information back to their settings and implement change aimed at increasing their organization’s level of cultural competence.

The lessons learned and the resources developed through the initiative are being shared with other healthcare organizations across Ontario.

Over the next two years, SickKids will continue to provide these workshops and consultation and support to organizations interested in advancing culturally competent care in their own settings. An online cultural competence community of practice will be created to facilitate discussion and an exchange of ideas. The series of e-learning modules and film will also be shared widely.

Discussion and Conclusion

Toronto and indeed Canada are becoming increasingly diverse as immigration contributes significantly to population growth. Changes in immigration patterns have led to an increasing number of visible minorities calling Canada home. In order to provide equitable and quality care, it is important to understand and respond to cultural factors that influence concepts of health and illness, health behaviour and help seeking. Cultural competence is therefore integral to providing quality care to patients and their families in a multicultural environment.

This initiative has demonstrated that integrating cultural competence into the organizational, clinical and structural facets of a healthcare organization is necessary to create a responsive and inclusive system of care. A clear articulation of intent by hospital leadership, which is then supported by focused invest-

ment of resources, is required. Sustainability planning and continuous evaluation are vital to such initiatives that tread new ground. Policies at the forefront of cultural competence should (1) address staff orientation and staff development to include cultural competence, (2) present clear guidelines and enhanced access to interpretation services, (3) delineate standards for culturally competent care and (4) emphasize a strong diversity research mandate. From a human resources perspective, hiring a diverse workforce at all levels and integrating cultural competence evaluation into standard performance evaluation will enhance organizational cultural competence significantly. Cultural knowledge that is institutionalized through effective education will enhance programs and lead to equitable healthcare.

While organizational endeavours are critical, the vision for culturally competent healthcare should move beyond organizations and be reflected as federal and provincial level policies and programs for there to be lasting and sustainable change that will result in equitable healthcare for our diverse communities across Canada. Learning from other jurisdictions, establishing benchmarks and setting standards related to the delivery of culturally competent and equitable healthcare are warranted and a way forward. **HQ**

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Finding a Balance between “Value Added” and Feeling Valued: Revising Models of Care

The human factor of implementing a quality improvement initiative using Lean methodology within the healthcare sector

Rachel Deans and Shawna Wade

Abstract

Growing demand from clients waiting to access vital services in a healthcare sector under economic constraint, coupled with the pressure for ongoing improvement within a multi-faceted organization, can have a significant impact on the front-line staff, who are essential to the successful implementation of any quality improvement initiative. The Lean methodology is a management system for continuous improvement based on the Toyota Production System; it focuses on two main themes: respect for people and the elimination of waste or non-value-added activities. Within the Lean process, *value-added* is used to describe any activity that contributes directly to satisfying the needs of the client, and *non-value-added* refers to any activity that takes time, space or resources but does not contribute directly to satisfying client needs.

Through the revision of existing models of service delivery, the authors' organization has made an impact on increasing access to care and has supported successful engagement of staff in the process, while ensuring that the focus remains on the central needs of clients and families accessing services. While the performance metrics continue to exhibit respectable results for this strategic priority, further gains are expected over the next 18–24 months.

In a world that is changing both in terms of the global nature of work and the diversity of the workforce, engaged employees are key to leading successful change management initiatives. The following article provides a summary

of how, through the use of Lean principles, Holland Bloorview Kids Rehabilitation Hospital enhanced the provision of quality services, increased access to care in pediatric outpatient clinics and successfully engaged staff in creating new capacity for change management within the organization.

Holland Bloorview Kids Rehabilitation Hospital (formerly Bloorview Kids Rehab) is Canada's largest children's rehabilitation hospital. Holland Bloorview is a world-class teaching hospital fully affiliated with the University of Toronto. The Bloorview Research Institute is located on-site, allowing us to integrate cutting-edge research and teaching with front-line care to improve children's quality of life. Holland Bloorview serves about 7,000 children each year, with about 600 in-patient admissions and 58,000 outpatient visits (Holland Bloorview Kids Rehabilitation Hospital 2011b).

Lean methodology is a management system for continuous quality improvement. It is based on the Toyota Production System that has as its focus two main themes: respect for all people and the elimination of waste or non-value-added activities. Within the Lean process, *value added* is used to describe any activity that contributes directly to satisfying the needs of the client, and *non-value-added* refers to any activity that takes time, space, or resources but does not contribute directly to satisfying client needs (Grabau 2009). Lean ensures that clients and families receive the highest-quality care and that front-line staff are able to achieve their very best through the removal of obstacles and barriers that prevent pride in workmanship (Institute for Healthcare Improvement 2005).

In the pilot phase of Lean implementation, the primary intent was to deliver on the organization’s strategic priority to improve access to care for clients and families and to meet corporate wait time targets (Holland Bloorview Kids Rehabilitation Hospital 2011b). The following were specific objectives for this initiative:

- To train the organization’s leadership and a front-line clinical team on the principles of Lean
- To optimize processes and support continuous quality improvement in the Neuromotor Developmental Pediatric Outpatient Clinics
- To reach the access-to-care target of *80% of clients seen within 192 days* from the time of the initial referral to first appointment

Method

Introduction of Lean

In August 2009, Holland Bloorview sought external consultant expertise to guide the first phase of education and to provide support at key stages of implementation. A team of individuals most likely to demonstrate success and champion the change were also identified to participate in the pilot. The team selected depicted strong management and physician leadership, and the front-line clinicians had exposure to the science of quality improvement; there was a sincere desire to improve the outcomes for the clients and families, and wait time metrics were being reported on a quarterly basis through the organization’s decision support framework.

By November 2009, all levels of senior administration from across the organization had participated in a leadership forum that introduced Lean concepts. This was important not only for the immediate staff who would be executing the changes but also to build awareness among those who were peripheral, but essential, to the improvement process, such as human resources, information systems and building services.

Lean Learning and Team Building

The next level of key influencers were identified to participate in targeted learning events such as Value Stream Analysis to map out the current state, and to identify value-added and non-value-added activities and a leaner future state for specific outpatient clinical areas (Institute for Healthcare Improvement 2005). By December 2009, an extended team of clinicians and administrators had been identified to actively participate in rapid improvement events called *Kaizen* that would initiate immediate quality improvement and targeted changes specific to the Neuromotor Developmental Pediatric Outpatient Clinics. These clinics provide essential developmental assessment services and act as a gateway to accessing specialty clinics and therapy for children with existing neuromotor concerns and their families, both internal and external to the organization.

Activating Lean Improvements

The active improvement phase of the Lean pilot relied on improving not only access to care for new clients on the wait list but also the services offered to existing clients being seen in follow-up outpatient clinics. The quality improvement work concentrated on the follow-up clinics and developing standard work, with workload levelling between physicians and nurses, and a new teaching-in-the-room model with the physician, medical trainee and the client and family. The intent was to reduce the length of time for a follow-up visit and thereby increase capacity in the schedule to see additional new clients. Specific outcome measures were established, and new processes and practices were monitored and reported on throughout each stage of the pilot.

Ensuring a Client- and Family-Centred Focus

Holland Bloorview has a long-standing commitment to client- and family-centred care. The commitment comes with an understanding that best practices in this area are always evolving, and a desire to stay at the forefront of advancing the practice (Holland Bloorview Kids Rehabilitation Hospital 2011a). The organization recognizes that quality improvements cannot happen without the strong voice of our clients and families. It is for this reason, that the partnerships between clients, families and staff at every level were vital to the success of the Lean initiative. As such, each stage of Lean learning involved clients and families with their perspectives, opinions and advice for creating a future state that would meet their service needs. These client and family perspectives were essential to the groundwork of the project and to remind the team why we were embarking on this journey.

Discussion

The primary purpose of the Lean quality improvement initiative was to better the access to care for clients and families seeking services through the Neuromotor Developmental Pediatric Outpatient Clinics. In order to effectively deliver on this corporate agenda, staff engagement was critical. The following discussion provides specific examples of engagement strategies that were employed to optimize clinical processes and build a front-line culture of continuous quality improvement.

“There were a lot of things I wanted to get involved in and change when Lean was first introduced. However, I learned early on, that the changes needed to involve the whole team and that we couldn’t jump to conclusions. Each team member was at a different stage of readiness, and so was I. Once we were all on the same page, the opportunities were endless.” (Michelle Hart, manager, client appointment services)

Over the course of the first year, during the active improvement stage, the team met on a daily basis for 15-minute “team huddles” in which outcome measures and performance targets

were reviewed. This provided an open forum for discussion and ongoing identification of quality improvement projects. A primary lead to facilitate the daily huddles was essential to support timely decision-making, the removal of barriers and the setting of priorities to keep the quality improvement work in scope. The team huddles were necessary to create collaborative opportunities for the group that consisted of quick wins and additional short- and long-term projects to monitor over time.

Role clarity is important at the early stages of Lean implementation. When individuals were treated with dignity and respect and valued for their contributions, and not simply as the occupant of a role, they were more likely to obtain a sense of meaningfulness from their interactions (Locke and Taylor 1990). For example, after several clinic observations and audits, it was evident that there was a significant amount of duplication of information gathered during the client assessment. The team initiated a workload-levelling approach to balance the roles and responsibilities shared between the nurse and physician attached to each clinic. This strategy created new opportunities for nursing to better use their skills and expand their professional scope of practice to include more opportunities for health promotion (i.e., the delivery of osteopenia guidelines, teaching sleep hygiene). Supporting these efforts increased the value-added content for clients and decreased the duplication of information gathered at each clinic visit.

The benefit of the team's work was realized not just within the clinics themselves; other program areas gained from strategies such as a 5S campaign (sort, set in order, shine, standardize and sustain) that standardized the working environment to provide better access to tools and materials regularly used in clinic (Graban 2009). The staff involved in the 5S campaign reported a significant improvement in their work environment, both personally and professionally.

"I found the 5S campaign extremely helpful to me and the work of the team. It allowed us to focus on what we actually needed and what was most important. Before the campaign, we used to go searching for things all the time. After "5S"-ing the clinic space, we were able to get rid of extraneous stuff that was no longer needed and prioritize the items we used every day." (Whillette Warren, clinic coordinator)

One of the most significant Lean initiatives as identified by staff was the introduction of the teaching-in-the-room strategy, which supported trainees debriefing with the physician in the room with the client and family during their appointment. This strategy decreased the total duration of individual clinic appointments by an average of 30 minutes. It received positive feedback not just from clients and families but also trainees and has since influenced the organizational model for teaching and learning in other outpatient clinics.

Almost two years later, the team is at the early stages of launching new follow-up models that have taken into consideration a year of improvement and increased knowledge of the true client demand. The new models propose a transformational change in practice that includes the following:

- A continuity-of-care model for specified client needs
- The introduction of a consultative model for clients who only require short-term developmental pediatric involvement prior to connecting with other external community supports
- The introduction of a monitoring model

The monitoring model will support an increased scope of practice for occupational therapy and physiotherapy in partnership with physician leads to monitor clients at specific stages of development. The model will allow for early identification of therapeutic needs while monitoring any medical complexities that may require physician or nursing attention.

Over a six-week trial with more than 100 clients, 89% of clients met the new follow-up model criteria. This is a positive indication of the potential impact to the demand within the physician-led follow-up clinics. The decreased demand for follow-up appointments creates an increased availability for new appointments to be made in a standardized schedule that meets the diverse needs of both new and existing clients.

Impact on Access to Care

At the end of March 2009, prior to the introduction of Lean, the wait time for 80% of clients and families to be seen in Neuromotor Developmental Pediatric Outpatient Clinics was more than 238 days. After the first year of Lean implementation, the wait time for a neuromotor outpatient appointment was reduced to 192 days for 80% of clients seen. These short-term results indicate success in meeting the identified target for the project. However, as previously mentioned, the success of the initiative relies on the sustainability of the work and the commitment of team members.

One area that has demonstrated sustainability in the improvement made to date involves the new clinic appointments in the Neuromotor Developmental Pediatric Outpatient Clinics. Prior to Lean implementation, between seven and 20 new clients attended the clinics in any given month. Since the introduction of Lean, the clinics have seen 20 new clients consistently every month, indicating a significant level of sustainability. The organization is able to meet the demand for this service with new clients; however, strategies to deal with the backlog are currently under way, and these include the launch of new follow-up models. While the performance metrics continue to exhibit respectable results for this strategic priority, further gains are expected over the next 18–24 months.

Conclusion

To realize the true accomplishments that can be demonstrated through the implementation of Lean principles in a healthcare setting, one must look beyond the bottom line. The ability to reach an identified target and deliver on objectives relies on the successful engagement and empowerment of front-line staff, clients and families.

Lean has the potential to impact on meeting the objectives of a quality improvement initiative and also on motivating staff to get involved in leading change and adopting a new understanding of change management. In a healthcare setting where every action toward the care of a client comes from a place of best intention, one of the most significant hurdles to overcome is adopting Lean language. Specifically, understanding that an activity may be “valuable” but not necessarily “value-added” to a client can help one realize an opportunity for improvement.

To effect change, the commitment to Lean must start at the top of the organization and involve staff at all levels as well as clients and families. Targeted educational activities that are specific to individual, team-based and organizational needs must be applied and reinforced throughout the organizational structure. Pitfalls can occur when there are communication breakdowns or there is a perceived lack of shared vision or commitment by team members. To avoid this, encouragement and involvement of higher levels of leadership in response to time-sensitive requests is essential.

The importance of recognition for team efforts and role clarity should not go unnoticed. Motivated key influencers in a quality improvement initiative assist in relieving tensions between the organizational needs and the personal/professional goals of each individual (Toussaint et al. 2010). Measurable outcomes that are monitored and re-evaluated by the team on a regular basis are important to ensuring the organization is on track and has not lost focus. In the end, the organization will have built a team that will guide the next stage of quality improvement feeling valued while continuously looking for ways to increase value-added and decrease non-value-added activities for clients and families in their everyday practice. By fostering new growth and expertise in change management that is organization-wide, true big dot measures can be realized.

“Being a part of the discussion and, more importantly, the decision-making was what I found most rewarding about Lean. I now know that when I have an improvement idea, someone is there to listen and together as a team we can make the changes happen for the benefit of clients and families in our care.” (Katrine Pilested, registered nurse, Neuromotor Developmental Pediatric Outpatient Clinics)

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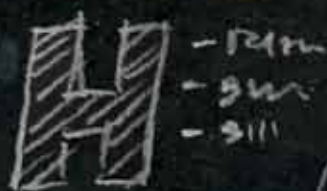
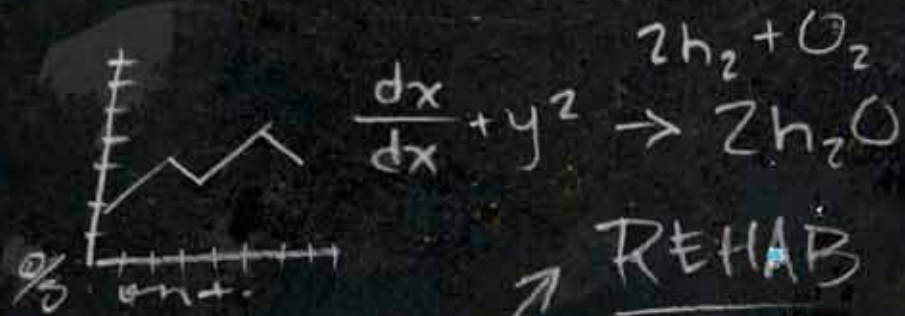
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Complex Care

Improving quality outcomes requires a strategic approach



$$\frac{\Delta P = \frac{64}{\rho \nu \epsilon d}}{2}$$

$$\frac{\sum (z - z)^2}{N}$$

REHAB

$$t_1 = \frac{r}{c_1} + t_2 \frac{r}{c_2} + z - t_1 = \Delta = r \left(\frac{1}{c_1} - \frac{1}{c_2} \right)$$



ACCESS

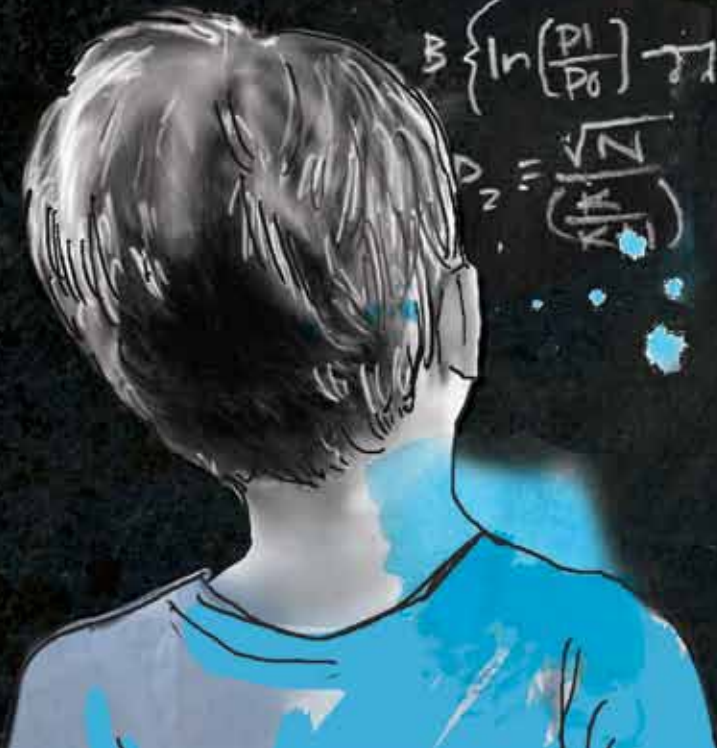
COMMUNITY CARE

$$\frac{t_s - 10}{t_s - 60} = 1.6$$

$$B \left\{ \ln \left(\frac{P_1}{P_0} \right) \right\}$$

$$D_2 = \frac{\sqrt{N}}{\left(\frac{P_1}{P_0} \right)}$$

$$r_{xy} = \frac{1}{2} (z_x - z_y)$$



Integrated Complex Care Model: Lessons Learned from Inter-organizational Partnership

Eyal Cohen, Cindy Bruce-Barrett, Shauna Kingsnorth, Krista Keilty, Anna Cooper and Stacey Daub

Abstract

Providing integrated care for children with medical complexity in Canada is challenging as these children are, by definition, in need of coordinated care from disparate providers, organizations and funders across the continuum in order to optimize health outcomes. We describe the development of an inter-organizational team constructed as a unique tripartite partnership of an acute care hospital, a children's rehabilitation hospital and a home/community health organization focused on children who frequently use services across these three organizations. Model building and operationalization within the Canadian healthcare system is emphasized. Key challenges identified to date include communication and policy barriers as well as optimizing interactions with families; critical enablers have been alignment with policy trends in healthcare and inter-organizational commitment to integrate at the point of care. Considerations for policy developments supporting full integration across service sectors are raised. Early indicators of success include the enrolment of 34 clients and patients and the securing of funds to evaluate and expand the model to serve more children.

Medical and technological advances continue to reduce childhood mortality rates, resulting in a dramatic increase in the prevalence of children with medical complexity (CMC) (Cohen et al. 2011; Wise 2004). Examples vary and include children with congenital or acquired brain injuries and significant medical and neuro-developmental sequelae, as well as children with multi-system conditions and associated feeding, respiratory and developmental health issues. CMC form a vulnerable group characterized by substantial health needs and complex and/or chronic underlying conditions that require highly specialized care and services over many years by multiple providers in many different settings.

Imperative to Change

Although CMC represent a small minority, they use exceedingly disproportionate and growing amounts of healthcare spending. In a large sample of American children's hospitals in 2006, these children accounted for 10% of admissions, 26% of hospital days, 40% of hospital charges and 73–92% of different forms of technology assistance (e.g., gastrostomy and tracheostomy tubes; Simon et al. 2010). CMC now account for more

than half of childhood deaths from medical causes outside the perinatal period (Feudtner et al. 2002).

While the *amount* of care these children receive is substantial, the *quality* of care delivered is largely suboptimal. Many CMC are subject to prolonged and multiple hospitalizations and are often readmitted to hospital for the same underlying problem (Berry et al. 2011). The scope of their healthcare needs places extraordinary stress on caregivers (Raina et al. 2005). In one study, over half of parental caregivers reported that a family member had quit their job because of their child's health demands (Kuo et al. in press). Coordination of care in concert with the needs of these children and their families is extremely challenging (Dosa et al. 2001; Matlow et al. 2006) and, if not done well, leads to untimely delays, fragmented communication, medical errors (Sacchetti et al. 2000; Slonim et al. 2003), dissatisfied patients and families, poor health outcomes (Kelly et al. 2002; Srivastava et al. 2005) and inefficient and costly use of health resources (Gordon et al. 2007).

The amount of care these children receive is substantial, but the quality of care delivered is largely suboptimal.

Focus on Integration

Traditional paradigms of complex care management have focused on a single community-based primary care provider.

This provider, usually a pediatrician or family physician, is responsible for all aspects of primary care as well as the coordination of referrals to community and hospital specialists. It is now generally accepted that the notion of a single provider being armed with sufficient knowledge and access to systems of healthcare, social services and educational supports for CMC may be unrealistic and misguided (King and Meyer 2006). While primary care reform initiatives across Canada have aimed to provide a team-based orientation to the care of patients, these models have not concentrated on the unique needs of children, in particular those with complex health needs (Miller et al. 2004). Given the frequent interface of CMC with the entire continuum of care (i.e. acute, home, primary and rehabilitation care sectors), it is imperative to promote *integration* that allows families to navigate the complex labyrinth of services and providers, creates value, reduces costs and ultimately improves child and family outcomes.

The promise of integrated care is substantial (Table 1). This premise was fundamental to the creation of the Integrated Complex Care Model (ICCM) and has revealed some positive outcomes as observed in practice during the early stages of model implementation.

ICCM: Creation

In 2009, the Toronto Central Local Health Integration Network (TC-LHIN), one of the 14 regional health networks in Ontario, launched a strategic initiative titled Integrated Care

TABLE 1.
Benefits and observations of the Integrated Complex Care Model

Target	Proposed Benefits	Observations in Practice
Child and family	Seamless care, better outcomes, less time-consuming, less stressful	Active engagement in goal setting and care planning Better alignment and timing of interactions at key transition points (i.e., home to hospital, hospital to home, hospital to hospital) Child- and family-centred approach focused on health needs versus diagnosis
Front-line provider	Ability to work across traditional professional/organizational boundaries, better job satisfaction	Opportunities for ongoing team building and education Coaching and mentorship to build skill and capacity Improved communication (i.e., provider to child/family, provider to provider)
Organization	Alignment of organizational goals, coordinating targets, activities and processes	Improved efficiency of care and service delivery Optimized process and resource use Collective vision and demonstrable support for integration efforts impacting quality of care
Funder	Developing system-wide solutions based primarily on leveraging existing system resources, clear accountabilities about system performance and evaluation	Improved cost-effectiveness by maximizing resources across the continuum Opportunity to leverage existing information systems and technology (e.g., Ontario's electronic Child Health Network)
Policy maker	Promoting and enabling effective service models and surrounding these with appropriate incentive and funding models	Local policy and practice changes to better support seamless integration (i.e., information management, confidentiality, sharing of health records)

for Complex Populations. The initiative’s mandate was to improve system sustainability by focusing on integrated care for select high-risk populations in the system. CMC, specifically medically fragile or technology-dependent children, was the sole pediatric population identified among five target populations. In order to develop a feasible, sustainable integration model for CMC within the TC-LHIN, an innovative and voluntary partnership was established engaging three organizations involved in providing care and service for this vulnerable population. These organizations included a children’s hospital (The Hospital for Sick Children), a pediatric rehabilitation hospital (Holland Bloorview Kids Rehabilitation Hospital) and a key organization that connects children to home care and other community services (Toronto Central Community Care Access Centre). Over the course of six months, team members across each partner organization sought input from a wide variety of stakeholders (e.g., primary care physicians, nursing agencies, patients and their families etc.) in order to develop the ICCM, which focused on *integration at the point of care* for CMC.

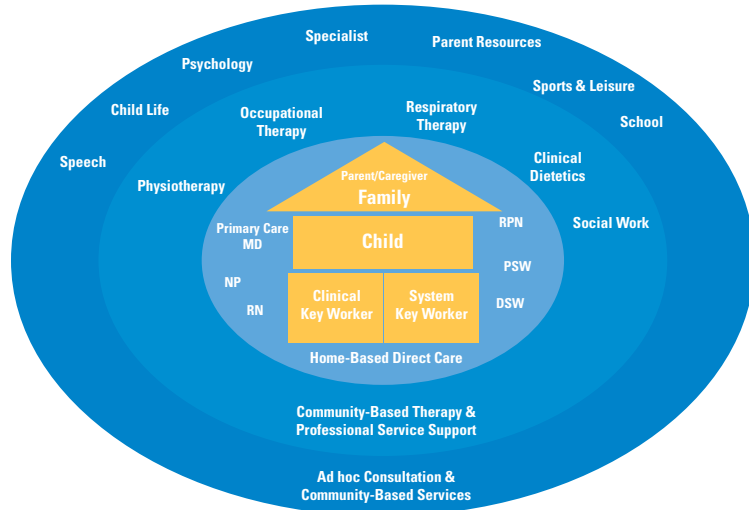
Specifically, the overarching goals of the ICCM were the following:

- Improved co-operation between organizations
- Better coordination across settings and levels of care
- Greater focus on children’s health needs as opposed to medical conditions
- Maximized accessibility and minimized duplication of services and resources
- Enhanced outcomes for children with complex, chronic health issues

ICCM: Operationalization

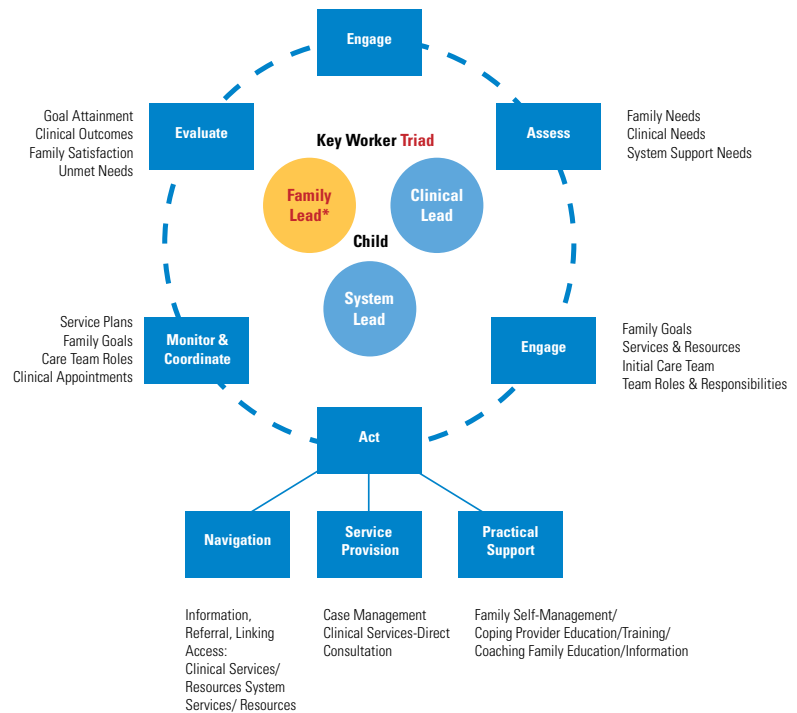
The ICCM creates a circle of partnerships that surround the child and family, providing holistic care that is “accessible, continuous, comprehensive, compassionate, coordinated, family-centred and culturally effective” (Homer et al. 2008: e922). Through inter-professional

FIGURE 1.
Conceptual model of the Integrated Complex Care Model



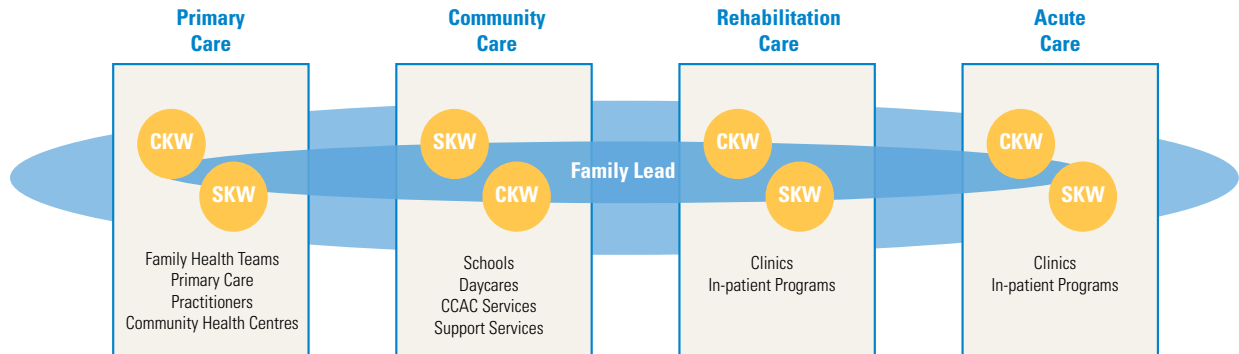
DSW = developmental services worker; MD = physician; NP= nurse practitioner; PSW = personal support worker; RN = registered nurse; RPN = registered practical nurse.

FIGURE 2.
Key worker triad



* family lead refers to parent or other primary caregiver and acknowledges their expertise and fundamental role in leadership of care.

FIGURE 3.
Key worker triad across the continuum



CKW = clinical key worker; SKW = system key worker; CCAC = community care access centre.

assessments, the coordination of relevant investigations, the sharing of information, the setting of mutual goals and the execution of treatment plan options in varied sectors and settings (Figure 1), the child and family are encouraged to participate and contribute in the design and plan of care based on changing needs and concerns. This approach promotes more collaborative care management among providers and also helps build the child's and family's confidence and capacity for managing care.

The model is formulated around the concept of a "key worker" for the child and family, acknowledging the need for a lead who assumes responsibility for ensuring coordination, communication and follow-through with the plan of care. Without such a lead, assumptions may be made as to roles and accountabilities, leaving the child and family at risk of "falling through the cracks." The key worker acts as the family's single point of contact within healthcare and across other systems (education, social services, financial resources, recreation, transportation, etc.).

Previous iterations of key workers in complex care models focused on either a single clinician, such as a nurse practitioner (Cohen et al. 2010; Rahi et al. 2004), or a community-based case manager (King and Meyer 2006). However, the end result of the ICCM partnership between hospitals and the community required the realignment of existing resources and led to the articulation of a two-person key worker team functioning with a family lead as part of a triad (Figure 2). In this model, a clinical key worker (CKW), who has a prominent focus on clinical needs, and a system key worker (SKW), who concentrates primarily on the system needs including community resources, work together with a family member who has the most direct knowledge and responsibility for meeting the child's health needs.

The CKW is a pediatric nurse with advanced skills and education in the provision of holistic care for this population of patients. Serving as a critical guide in helping lead the clinical

care of the complex child, the CKW has comprehensive knowledge and understanding of various disease processes and the subsequent effects on these children. The CKW carries out many responsibilities including performing telephone triage, making clinical decisions, coordinating healthcare and assisting families to plan for key transitions. The CKW also ensures that there is an "interface" between the child, family, providers and key services and organizations, working in concert with the SKW.

The SKW is a community care coordinator designated to provide case management services to children with complex care needs. The SKW coordinates cross-sectoral services, makes referrals, secures relevant resources and assists families to plan and navigate the system. The SKW works with the CKW to provide ongoing collaborative support.

Key workers are expected to work independently, meeting regularly with each other. One key worker may assume a more prominent role at different times across the child and family's continuum of care (Figure 3), but the family is always involved in leading care planning, decision-making and coordination. The key workers are not co-located – both are housed in their own employment setting. Their communication can be conducted in person, via the telephone, by secure e-mail or through an electronic portal.

The frequency of key workers' contact with the child and family is individualized based on the goals and service needs. The key worker team is expected to formally connect with each other in the following situations:

- A transition is anticipated, such as an agency admission or discharge, a move to the adult system, entrance to school or daycare, a move to another LHIN, a change of primary care practitioner etc.
- There is a change in the child or family's situation or health

TABLE 2.
Components of the Integrated Complex Care Model

Components	Rationale
Shared care	<i>The right people, with the right information, doing the right things, in the right order, at the right time.</i> This principle recognizes that no one organization, discipline or provider can adequately meet all the needs of the chronically ill child and family. It also acknowledges that inefficiencies commonly occur when multiple organizations independently try to tackle complex health problems in a child. For these reasons, this component speaks to the need to promote complex medical support in a variety of settings including acute care hospitals, transitional care settings and the community.
Team-based care	This component envisions a multidisciplinary team that uses the unique skills of team members; involving expertise from a number of different disciplines (e.g., nursing, occupational therapy, physiotherapy, medicine, dietetics, respiratory therapy, education, social work and personal support) across organizations and sectors. It recognizes that not every team member needs to be involved in the care of every child. Sufficient flexibility needs to be developed in the construction of the team to ensure that each child receives appropriate care delivery: <ul style="list-style-type: none"> • Shared care delivery between tertiary care and rehabilitation hospital specialists, community care access centres and community providers (e.g., primary care physician) • Key workers as a facilitator between community- and hospital-based providers and services
Joint accountability	This component removes the traditional barriers of silos to integrated care that occur when providers are accountable to a single organization (e.g., a hospital, or a community agency). A successful model allows (and promotes) the movement of team members with the child to the multiple locations of care wherever it is provided; and that partnering organizations facilitate this by sharing resources for the seamless provision of care. This component requires innovative partnership between hospitals, community care access centres and other providers/agencies.
Electronic care plans	Co-created by family and key workers, this document contains salient medical and psycho-social information including an updated list of medications, care providers and appointments as well as goals of care. Copies of the care plan will be provided to families and placed in the health record and will be accessible to providers in a both community and hospital settings through an existing platform – the Ontario Electronic Child Health Network.

status that requires a review of the goals, services or care team.

- There is an admission to hospital (planned or unexpected).
- The family requests a care conference.
- A scheduled review of the child and family’s plan or services has been pre-determined.

Other operational components and guiding principles of the ICCM are summarized in Table 2.

ICCM: Evaluative Framework

The Institute for Healthcare Improvement (IHI) believes that optimization of the health system must consider the simultaneous pursuit of three aims: a better care experience for individuals, better health for defined populations and reduced, or at least controlled, per capita cost of care. This framework, referred to as the IHI Triple Aim (IHI 2011), serves as a basis for the ICCM evaluation, which includes a combination of quantitative and qualitative methods to collect data for analysis. The impact of the ICCM is being evaluated based on the effectiveness of healthcare quality with respect to family centredness of care, family function and quality of life (parental and child); the efficiency of health resource use as measured by emergency department visits, hospitalization days and use of rehabilitation services; and care coordination experience as measured by interviews with families and clinical staff and care plan reviews.

Thirty-four children and families have been enrolled in the model and will be contributing to the evaluation.

ICCM: Reflections on Model Building Enablers

The sustainability of the model is facilitated by a number of important enablers, including alignment with policy priorities and integration at the point of care.

Alignment with Policy Priorities

High-level integration of care across organizations and across the cycle of care has been recognized as an important health policy priority for complex client populations. In particular, the creation of true value for clients and families is now increasingly being driven by incentives to find system efficiencies. Aspects of the ICCM have already been espoused by other LHINs in Ontario (e.g., Champlain [Ottawa]), and there is a strong interest in expanding into other jurisdictions as well.

Integration at the Point of Care

A cardinal feature of the ICCM is a unique and voluntary integration of multiple partners across the *healthcare continuum* (hospital to community; hospital to hospital) who are motivated to develop a useful and sustainable model of care for CMC and replace existing models that have been perceived as subop-

timal. The ICCM has been designed with the aim to enable children, families and healthcare providers to cross traditional organizational barriers, and to create a new cadre of empowered advocates to promote and sustain integrated care.

The ICCM has been designed with the aim to enable children, families and healthcare providers to cross traditional organizational barriers.

Opportunities

Many of the barriers encountered in the care of CMC have served as the impetus for change and ongoing development of the ICCM. A number of challenges remain; however, concerted efforts have been directed toward leveraging opportunities for improvement, specifically related to information management, infrastructure, scalability and family centredness.

Communication Strategies

Given the number of providers, sectors and levels of care involved in effectively managing CMC, the tools and technology required to support communication and collaboration are key to enabling the seamless coordination of care. Information management has been the biggest challenge for the key worker team and represents an issue that is common to all integration initiatives. Efforts are being directed to overcome this, leveraging existing systems and technology both from within and across the partner organizations (e.g., Ontario's electronic Child Health Network). Key learnings from model implementation can help inform and influence the implementation of a comprehensive, information-management solution with broad utility for providers, patients and families.

Policy Barriers

Policy barriers that are real, perceived or potential pose a threat to the delivery of coordinated, family-centred care and service. Privacy associated with integration and information management, limited use of non-regulated providers, a lack of family-directed funding models, capitation to available services, shortages of pediatric home care providers and outdated coverage by insurance carriers have been noted as barriers impacting the ability to extend the level of community-based care that is required to keep CMC at home and in their own community. As well, engagement of broader team members and resources beyond the key workers has been identified as critical in order to achieve the level of seamless integration required for this population (i.e., service providers, primary care, inter-professional teams, community resources and agencies). The next phase of ICCM operationalization will concentrate on the engagement of the broader team to advance integration beyond

the key worker dyad and a robust evaluation that will reveal specific policy and process issues impacting CMC to inform policy directions at local and provincial levels.

Interfacing with Families

The ICCM has identified the need for more creative strategies to engage CMC and their families (i.e., via e-mail, telephone, coordinating with other appointments, telemedicine) in goal setting and planning care at key transition points in healthcare over time (e.g., preschool to school age) and place (e.g., hospital to home). Past models and interventions built within traditional paradigms, where the focus has been on family meetings, are no longer sufficient, particularly when families are not available for a home visit due to work, school and real-life limitations. As a result, the key workers endeavour to maximize opportunities for collaboration with children and families during existing visits and activities (i.e., at home, school, hospital), at critical points of transition (discharge, admission, transfer) and through interactions by telephone, teleconference and tele-home care.

Conclusions and Future Projections

The "system" of healthcare is currently somewhat of a misnomer because of silos that continue to impede the delivery of seamless, comprehensive child- and family-centred care. The ICCM is a promising model highlighting the potential of a true system to effectively integrate complex care delivery across organizational structures, service sectors and regional boundaries.

A predicted growth in numbers of CMC, combined with concerns of escalating costs and "balkanization" across essential interfacing sectors (health, education and social services), provides the impetus for a continued evolution of systems to provide value across the entire cycle of care from the hospital to the community (Porter 2009). The TC-LHIN remains committed to integrative care efforts and has approved the expansion and ongoing evaluation of the ICCM to include 50 children by the end of 2011. This commitment, along with the foundational principles established by the ICCM, bodes well for further development and replication of the model to facilitate delivery of care as close to home as possible for diverse populations whenever integration is essential to optimal health outcomes. **HQ**

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Transitions

Our frequent inability to ensure older adolescents experience a seamless transition

Tools for Addressing Systems Issues in Transition

Khush Amaria, Jennifer Stinson, Geraldine Cullen-Dean, Karen Sappleton and Miriam Kaufman

Moving from pediatric to adult healthcare is a time of stress and opportunity for adolescents with special healthcare needs (ASHCN) and their families. With over 90% of children with special healthcare needs surviving into young adulthood, there is an increasing imperative to actively engage youth in preparing for the adult system (Betz and Smith 2011; Pai and Schwartz 2011). The goal of transition care is to provide young people with a coordinated, uninterrupted and developmentally appropriate transfer to adult healthcare (Kaufman and Pinzon 2007). This is often complicated by the complex medical, social and psychological tasks and requirements that adolescents experience as they navigate their healthcare and their lives as young, developing people.

There is extensive evidence that transition is risky business and that healthcare transition programs for ASHCN are a way to reduce the risks involved (Kennedy and Sawyer 2008; Rapley and Davidson 2010). In addition, there are many international and national position statements and policy documents that call for transition planning and evaluation of transition outcomes (e.g., American Academy of Pediatrics et al. 2002; Kaufman and Pinzon 2007). Despite this, there remain many issues that impede the successful transition of ASHCN to adult care, including barriers related to the patients, parents, organizations and providers (pediatric and adult; Shaw and DeLaet 2010; Tucker and Cabral 2005). If these barriers can be overcome, the

transition process will support ASHCN to gain a greater sense of independence, a feeling of graduating or “moving on,” a more positive sense of self and expertise in managing their health and their life. Transition into the adult system can provide an opportunity to focus on self-management and on adolescent issues (Dempsey et al. 2009), such as sexuality, reproduction, substance use, body image and violence prevention, all of which can be magnified in adolescents with chronic health conditions.

Issues for Patients and Parents

A number of studies have examined the attitudes and perceptions of ASHCN and their parents in an attempt to identify barriers and facilitators associated with transitions and to ultimately support the development of successful healthcare transition planning (McDonagh 2007; Wong et al. 2010, 2011). Common themes emerge in all the populations studied. Adolescents' attitudes can differ from those of their parents, seeing transition as “no big deal” and even appearing apathetic to the process (Anthony et al. 2009). In contrast, parents generally report anxiety about transfer of care (Reiss et al. 2005), worry they will no longer be able to participate in the care of their child and believe that providers of adult healthcare are not knowledgeable about pediatric-onset conditions. Parents expect to have to re-educate providers of adult care and feel less confident in these providers compared with their pediatric counterparts.

Parents and youth often have very specific negative impres-

sions of care in the adult system (Reiss et al. 2005). The adult system is seen as unsupportive and less nurturing. Providers of adult healthcare are viewed as busier, with less time to answer questions or provide individualized care for their patients. Treatment and services are seen as fragmented and lacking an integrated multidisciplinary approach. Finally, the adult system is seen as neither collaborating nor communicating with the pediatric system. While some of these issues are based on real challenges faced by youth in transition, these negative attitudes are often fostered in the pediatric system. There are benefits or positives to transferring into the adult healthcare system, at a time when the patients' needs are becoming those of adults, but parents and youth are often unaware of these benefits. Although it is clear that adult survivors of childhood-onset health conditions may develop co-morbid conditions with which pediatricians are not familiar, it may not be made clear to young people and their parents that they will be best cared for by adult specialists.

Having entered the adult system, young adult patients and their parents identify additional issues: the system serves older adults and is not designed for emerging adults; many of the comforts of children's hospitals (e.g., private rooms, entertainment systems) are not automatically available; and they are required to build trusting relationships with new healthcare teams. At this time, patients and parents also often report feeling abandoned by their pediatric institution if they did not have the opportunity to prepare emotionally for the change.

Entry into adult healthcare highlights the lack of early preparation for transitions as an issue that affects both patients and parents. Patients are unlikely to be independent self-managers of their health at the time of transfer, given that time-of-transfer decisions are based on "aging out of treatment" versus factors of illness severity or emotional and cognitive maturity (Reiss et al. 2005). As pediatric age limits are unlikely to change in Canada, transition should be a process that begins in childhood and ends sometime in adulthood. This will help support youth and young adults achieve their optimal self-care capacity, but it requires education and training of adult-focused providers.

Systems Issues

There are issues with transition at all levels – the individual patient and parents, the family within Canadian cultures, pediatric institutions and adult-focused care. At the most basic level is the adolescent brain, a highly complex system that is in the process of developing during the period of transition. Many of the underlying causes of poor adherence (a major barrier to successful transition) are due to incomplete acquisition of executive functions, including limited insight into the impact of poor adherence and a lack of impulse control. This immaturity of the prefrontal cortex is probably also linked to difficulties with self-advocacy and self-management skills (Casey 2000).

Within Canadian culture, there are many demographic,

economic and societal changes that have resulted in youth and young adults living at home longer, thereby keeping their parents involved in many aspects of their lives, including their interactions with adult healthcare. Not surprisingly, parents often experience difficulties relinquishing control and also feel reluctant to leave the pediatric environment and staff (Reiss et al. 2005).

The biggest transition issue within the healthcare system is that there is no real *healthcare system*. Communication, collaboration and coordination between pediatric and adult hospitals (not to mention home care, educational institutions and assisted living) are inconsistent and sometimes nonexistent.

People are at the centre of systems, and pediatric providers may experience difficulty letting go of their patients, feeling they provide better care than adult specialists can. The current focus on family-centred care can result in patients always being seen with a parent and not being coached to develop self-management skills. Although, in general, ASCHN with more complex conditions receive healthcare transition services more often than do those with less complex conditions (Scal and Ireland 2005), ASCHN with mental health diagnoses have few services available to them.

In adult healthcare facilities, there is inadequate knowledge of congenital and pediatric-onset conditions, fewer inter-professional teams, difficulty in accessing mental health services and a feeling that pediatric patients are difficult because they have been coddled by pediatric institutions. Procedures must be developed to improve the communication between pediatric and adult providers and to recognize the differences in each other's healthcare delivery mode while working collaboratively to promote the development of patient self-management skills.

Currently, there is an inability to track and measure healthcare transition planning outcomes. By definition, transition outcomes cannot be measured while young people are still in pediatric care. Betz and Smith (2011) have recommended that outcomes include (1) access to adult healthcare providers; (2) a medical summary from the referring provider; (3) enrolment in an adult health insurance program; (4) competency in self-management; (5) enrolment in training or educational programs leading to employment with healthcare benefits; and (6) the acquisition of independent living skills. Other than competency in self-management, these are all measurable but do not reflect the richness of the transition experience. Few studies have addressed the measurement of broader developmental and bio-psychosocial outcomes such as adherence, resiliency, quality of life, coping and self-efficacy. There are multiple issues that hinder our ability to measure these outcomes. First, single discrete events are easier to measure than events that take place over time and across healthcare facilities. Outcomes related to medical transfer are more easily measured than developmental changes that occur over longer periods of time. There is no consensus on what constitutes readiness and successful transi-

tion, and few reliable and valid measures of assessment (Betz and Smith 2011).

Solutions

Interventions to improve the transition process include the following:

- Educating adult providers regarding the unique attributes of youth
- Creating an interest in adult-centred institutions about pediatric-onset diseases (Tuchman et al. 2010)
- Designing procedures for collaboration between adult and pediatric programs (Taylor et al. 2006)
- Creating teams that focus on particular diagnoses rather than age groups, with pediatric and adult providers collaborating on treatment plans and protocols (Sable et al. 2011)
- Allowing co-access to electronic health records for pediatric and adult centres
- Creating “young adult” clinics jointly staffed by pediatric and adult providers (Nakhla et al. 2009)
- Having clear protocols for the sharing of information at the time of transfer (Peter et al. 2009)
- Preparing young people for adult care (and adult life)

Many of these solutions require the administrations of pediatric and adult centres to collaborate, while others can be generated at different levels of these organizations.

Tools for Transition

The Good 2 Go Transition Program was established in 2006 at The Hospital for Sick Children (SickKids) in Toronto. Its goal is to prepare all youth with chronic health conditions to leave SickKids by the age of 18 with the necessary knowledge and skills to advocate for themselves (or through others), maintain health-promoting behaviours and use adult healthcare services successfully and appropriately. Although the team has been involved in the education of, and negotiations with, adult providers, much of the work of Good 2 Go involves preparing youth for transition. The team offers direct transition service to high-risk patients, education and consultation with hospital programs and has developed a number of tools that can be used as is or customized to individual program requirements. Tools have also been developed by other programs within the hospital with input from Good 2 Go, and new tools are continuously created to further support transitioning families. Efforts are being made to ensure that tools, outlined below, are useful for the broad diversity of the populations we serve.

These tools can be as simple as a **transition poster** (displayed in all ambulatory clinics) that is a visual reminder of the expectation for healthcare providers to prepare patients to leave pediatrics and enter adult care.

FIGURE 1.
Getting Ready for Adult Care booklet



Readiness checklists are self-reported (and parent-reported) measures of a youth’s medical knowledge, autonomy and skills needed to self-manage healthcare. This tool helps the healthcare provider create a plan for skill development and can be used to monitor change over time. A summary of the checklist can be included in the transfer summary.

As adult self-management models are often not appealing to young people, a manual has been developed in collaboration with an adult centre. This is being tested for a two-day **self-management group** for adolescents and young adults with chronic health conditions.

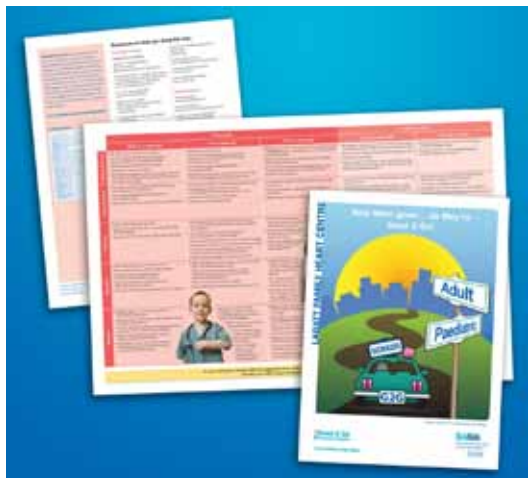
The **three-sentence summary** (with corresponding reminder bookmark) encourages young people to develop a succinct summary of their health history by learning what is most important to report in an interaction with a healthcare provider.

ASHCN are able to learn how to independently communicate with healthcare providers – a crucial skill in adult healthcare. Clinics are encouraged to set an age at which they will begin seeing children without parents for part of their visit in a **solo interaction**.

The **Getting Ready for Adult Care booklet** was developed with feedback from current and recently graduated pediatric patients, as well as adult providers. It gives general information about preparing for adult healthcare and checklists for adult clinic appointments and has customizable program-specific inserts (Figure 1).

“**Help them grow...so they’re Good 2 Go**” timelines (handout and poster) highlight how a child with a chronic health condition can move along a developmentally appropriate continuum from birth toward increased self-management. Program-specific timelines are developed collaboratively, with

FIGURE 2.
Good 2 Go Timelines – handout and poster



expertise from inter-professional care providers, patients and families and sometimes adult healthcare providers. The posters are placed in clinic waiting areas and examination rooms. The handouts are given to families at time of diagnosis and reviewed at follow-up appointments (Figure 2).

Online self-management and education programs have been developed and are being tested for a number of conditions (Stinson et al. 2009). Several applications (“apps”) are in development, including one for young people with inflammatory bowel disease and one for transplant recipients.

Transfer clinics provide a structured meeting between patients and the new adult care team. Patients participate in small group discussions facilitated by Good 2 Go team members, meet their new adult provider, complete a MyHealth Passport and receive a graduation certificate.

MyHealth Passport (www.sickkids.ca/myhealthpassport) is a free online program that helps a young person to create a wallet-sized card with important health information. It was developed following recommendations that ASCHN have healthcare passports as an essential element for successful transition (Knauth et al. 2006). MyHealth Passport was originally designed to improve adolescent patients’ knowledge of their health history, to give them a sense of ownership of this information and to ensure that important information is communicated in a new or emergency situation. Early evaluation revealed that a number of parents were making MyHealth Passports for their younger children and that many users were above the pediatric age limit (up to age 91 years), so the passport templates have been expanded to the needs of a wider population. There are currently 40 templates, many of which are for congenital or childhood-onset conditions. A generic template can be used for

FIGURE 3.
Bookmark detailing MyHealth Passport



conditions that do not yet have a specific template. Templates have lists of common medications, interventions and diagnostic tests that can be checked off and spaces for activities of daily living and names of healthcare providers, pharmacies and emergency contacts for the condition. When evaluated, MyHealth Passport has been shown to be easy to create and portable, to increase knowledge and to improve communications with providers and emergency personnel (Wolfstadt et al. 2011; Figure 3).

Conclusion

Collaboration between adult and pediatric services is crucial to a seamless transfer of care in many pediatric-onset conditions. Adolescents and families can also be prepared to take on new roles and responsibilities after transfer. Barriers to the adoption of transition tools include a perception that staff are too busy to use them and the potential inappropriateness of the tool for a particular population (e.g., complex care patients with severe intellectual disabilities will not be able to complete the checklist). However, tools can be an effective adjunct in the quest to address the systems issues that interfere with successful transition. A well-planned, coordinated and developmentally appropriate transitioning program, along with a proper transfer from pediatric to adult healthcare, can improve adherence to treatment in ASHCN and decrease loss to follow-up. The long-term impact of these tools on the systems issues discussed in this article remains to be seen, and the results of evaluations are optimistically awaited. **HQ**

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Kids in Transition: The Rehab Experience

Cindy Bruce-Barrett, Alastair Hodinott, Arbel Manicat-Emo, Tonya Flaming, Daune MacGregor, Iris Hogan, Chris Carew and Sandi Cox

Holland Bloorview Kids Rehabilitation Hospital (formerly Bloorview Kids Rehab) is Canada's largest teaching hospital for pediatric rehabilitation and the only in-patient pediatric rehabilitation centre in Ontario. SickKids is a quaternary-level academic health sciences centre. The acute care neuroscience and trauma patient population at SickKids represents the largest volume of transitioning clients between the two organizations. For years, the number of medically unnecessary days associated with patients awaiting transfer from SickKids to Holland Bloorview for off-site rehabilitation was consistently driven by inefficient processes, multiple handovers, duplicious efforts, fragmented communication and a lack of timely or complete referral information. Recognizing this situation as a threat to access, as well as a significant risk to patient health outcomes, SickKids and Holland Bloorview embarked on an exciting partnership (Kids in Transition: The Rehab Experience) as part of a larger Ministry of Health and Long-Term Care-funded initiative, the Flo Collaborative.

Results of this partnership have exceeded expectations, and concerted efforts have since been directed at sustaining and spreading improvements as well as forging further partnerships across teams at both organizations. This article provides an overview of the Kids in Transition initiative, highlighting the improvement team's efforts, the outcomes and, most importantly, the factors considered critical to the success of implementing and sustaining process improvements on an ongoing basis.

Patient Population

The pediatric neurosurgery patient population represents the largest volume of clients that transition from SickKids to the Brain Injury Rehab Team (BIRT) at Holland Bloorview each year. Delays in transferring these patients to a rehabilitation setting impedes timely access to therapy, generates unnecessary acute healthcare costs and can ultimately impact the quality of care and threaten health outcomes for the child who awaits transition to a less acute level of care. Due to the volume of patients managed by both organizations as well as the concerns about the impact of delayed transition, the neurosurgery in-patient population and the associated "home units" at SickKids and Holland Bloorview were selected for the launch of the pediatric Flo Collaborative project in 2007.

The Flo Collaborative

The Flo Collaborative was inspired by an actual patient, Flo, who experienced great difficulty navigating her way through acute care to long-term care following discharge. In May 2007, invitations were sent by the Centre for Healthcare Quality Improvement (formerly the Ontario Health Performance Initiative) calling upon acute care hospitals, community care access centres and other sectors (complex continuing care, rehabilitation, long term care) to join the collaborative and start improving patient transitions from acute care facilities to subsequent care destinations in Ontario. SickKids and Holland

Bloorview agreed to join the Flo Collaborative, forging the only pediatric partnership within the 29 quality improvement partnerships that were established across the province.

Improvement Team

In order to adequately support the collaborative, an Improvement Team and a Steering Committee were struck, both with leadership and representation from Holland Bloorview and SickKids. Members of the Improvement Team remained committed to working together for a period of 18 months, assessing the transition process, identifying delays and bottlenecks and implementing the necessary improvements to reduce the number of medically unnecessary days (target of 50% reduction) for neurosurgery patients transitioning to Holland Bloorview. The Improvement Team was co-chaired by two team leads (one from each institution). These leads were essential in helping to maintain momentum and move the project forward and in ensuring the team remained on task, on time and on budget.

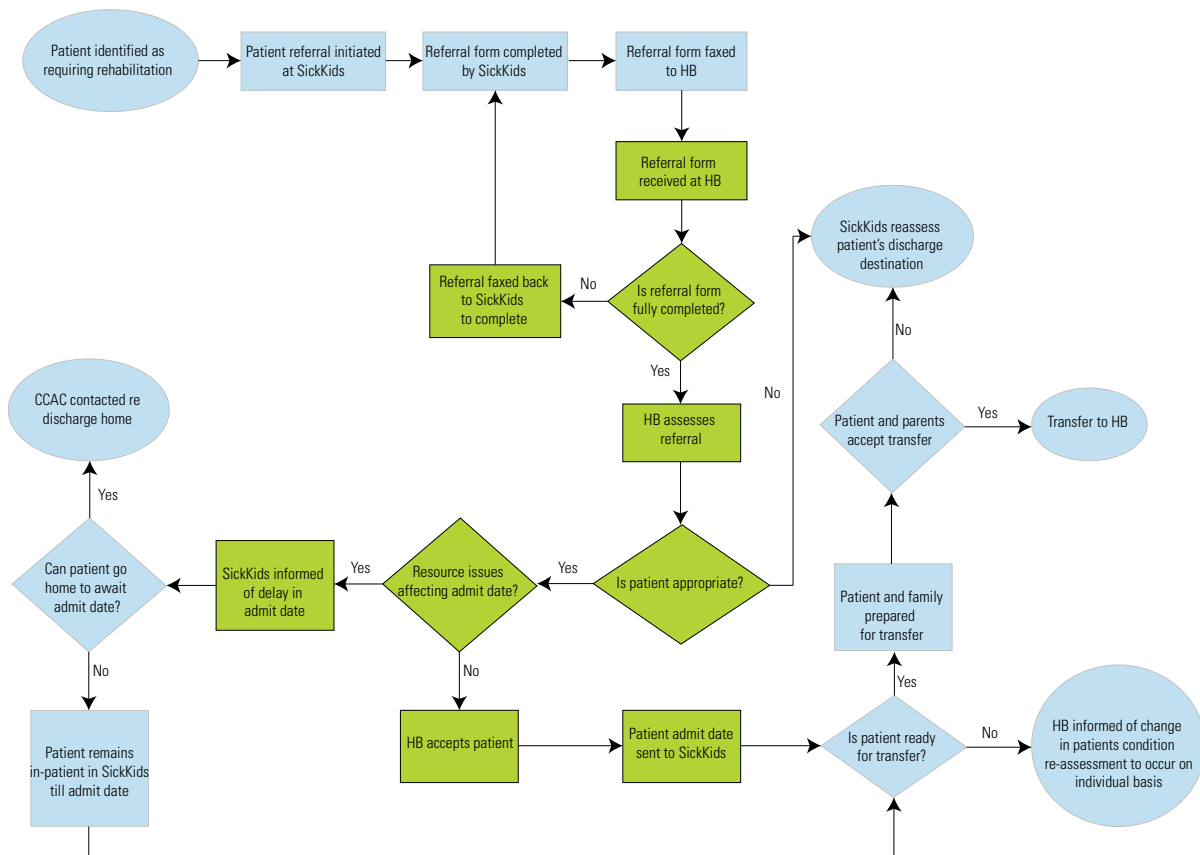
The leads also met with the Steering Committee once a month to report on the progress of the project.

The Steering Committee consisted of senior leaders and senior champions with overall accountability for achieving the desired goals associated with the project. The committee provided both strategic and tactical support for the Improvement Team and served as “process owners” for the project, removing barriers and making sure the appropriate resources were allocated to ensure success.

Further guidance was provided by an improvement advisor (IA) – a member of both the Improvement Team and Steering Committee, who had the opportunity to participate in additional training and education as part of the ministry-funded collaborative. The IA helped with data collection and analyses and facilitated the communication of results and ongoing measurement between improvement team members, the ministry and the Steering Committee.

Front-line staff nurses, physicians and other members of the

FIGURE 1.
Flow diagram tool



CCAC = community care access centre; HB = Holland Bloorview Kids Rehabilitation Hospital.

inter-professional practice team from both institutions were engaged as Improvement Team members. They were encouraged to provide their perspectives and input regarding process issues and also came to serve as champions when implementing, communicating and sustaining change.

Team and Steering Committee meetings were pre-set and convened biweekly (Improvement Team) or monthly (Steering Committee), rotating between the two institutions. Each institution also had smaller task groups that met on the alternate weeks to focus on specific initiatives and detailed work. During each meeting, individuals were assigned tasks with the accountability to follow through for the next meeting.

Process Improvement

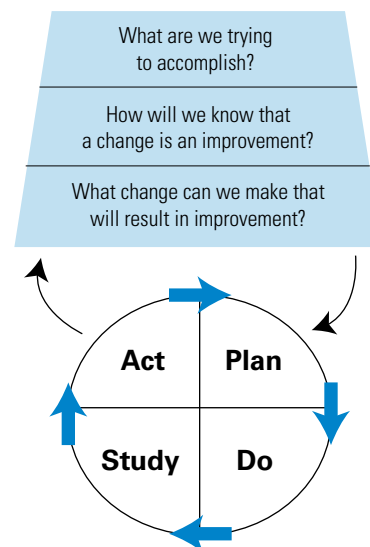
During one of the preliminary meetings, the improvement team engaged in flow mapping and used a flow diagram tool (Figure 1) that helped to highlight the issues associated with the transition of patients between SickKids and Holland Bloorview. In addition to the obvious transfer delays, team members were able to identify other issues including significant duplicity of workload, a lack of accurate and timely referral and transfer information, and fragmented communication between teams, patients and families.

The team identified that multiple people were doing various aspects of the same job and that, although information was being shared, no one quite knew the context of what was being communicated. This resulted in wasted time, effort and resources. Flow mapping also helped the team identify inconsistent use of the Holland Bloorview referral form: SickKids used the form to gain acceptance into the BIRT program (a referral form), and Holland Bloorview used the form as a source of patient information to prepare for admission (a transfer form). Team members identified a lack of consensus among staff at each organization regarding what was considered “medical stability” and “rehabilitation readiness.” There was no clear process on how to identify patients who were “medically ready” for rehabilitation. For example, staff at SickKids considered a patient on triple intravenous antibiotics as being medically ready for rehabilitation, whereas Holland Bloorview staff perceived such a patient as not medically ready since this level of medical intervention would prevent the child from participating in rehabilitation activities. Based on Holland Bloorview’s in-patient referral guidelines, a comprehensive checklist was created that outlines candidacy criteria for determining both patients’ medical stability and their rehabilitation readiness. Once patients meet the criteria, they are then deemed appropriate to be transferred to Holland Bloorview. This change has enhanced communication and provided more timely patient information, resulting in an expedited receipt of referral, acceptance and patient transfer – the three steps that previously drove the medically unnecessary days at SickKids.

Reflecting upon each of the issues identified, the Improvement Team decided to focus attention on streamlining the referral process and improving communication between the two organizations. The exercise began by investigating the reasons for transfer delays and determining how medically unnecessary days could be reduced by a target of 50%. It became clear that there needed to be mutually agreed upon medical and rehabilitation readiness criteria to ensure more appropriate referrals. Medical staff at Holland Bloorview and SickKids worked together to establish guidelines and then turned their attention to the actual process and tools associated with making a referral.

The referral form, which was previously used by SickKids to gain acceptance into BIRT and by Holland Bloorview to prepare for admission to BIRT, required four pages of in-depth information that had to be completed by approximately four people and could take up to 72 hours to finalize. The information was usually quite outdated by the time of transfer, undermining its utility as a source of accurate patient information. The team decided to revise the referral form, and using the model for improvement shown in Figure 2, engaged in multiple Plan-Do-Study-Act (PDSA) cycles to ensure that the most appropriate information was captured on the form. This framework also encouraged front-line staff involvement, providing them with an opportunity to be part of the decision-making process. The changes resulted

FIGURE 2.
Model for improvement



IHI uses the Model for Improvement as the framework to guide improvement work. The Model for Improvement, developed by Associates in Process Improvement, is a simple, yet powerful tool for accelerating improvement. This model is not meant to replace change models that organizations may already be using, but rather to accelerate improvement. Accessed from <http://www.ihi.org/knowledge/Pages/HowtoImprove/default.aspx>.

in a shorter referral form, from four pages to two, which requires one person approximately one hour to complete.

Although the revised referral form enabled Holland Bloorview to provide a more timely response with regard to the acceptance of patients into the program, it did reduce the amount of information Holland Bloorview received regarding patients' conditions and care, leaving it somewhat unprepared for patients at the time of transfer. The team determined that additional information, closer to the time of transfer, was required, and a new handover tool was developed. This tool became an essential document, providing the most up-to-date clinical picture of the patient 48 hours prior to transfer. The new process allows the time to plan more appropriately for patients, thereby ensuring a safer and more seamless transfer.

In addition to the handover tool, the team also felt that it was important to create a one-page transfer form that would accompany patients on the day of transfer, essentially documenting a report of status that day, particularly any changes in nursing care that may have occurred during the 48 hours since the handover tool was sent.

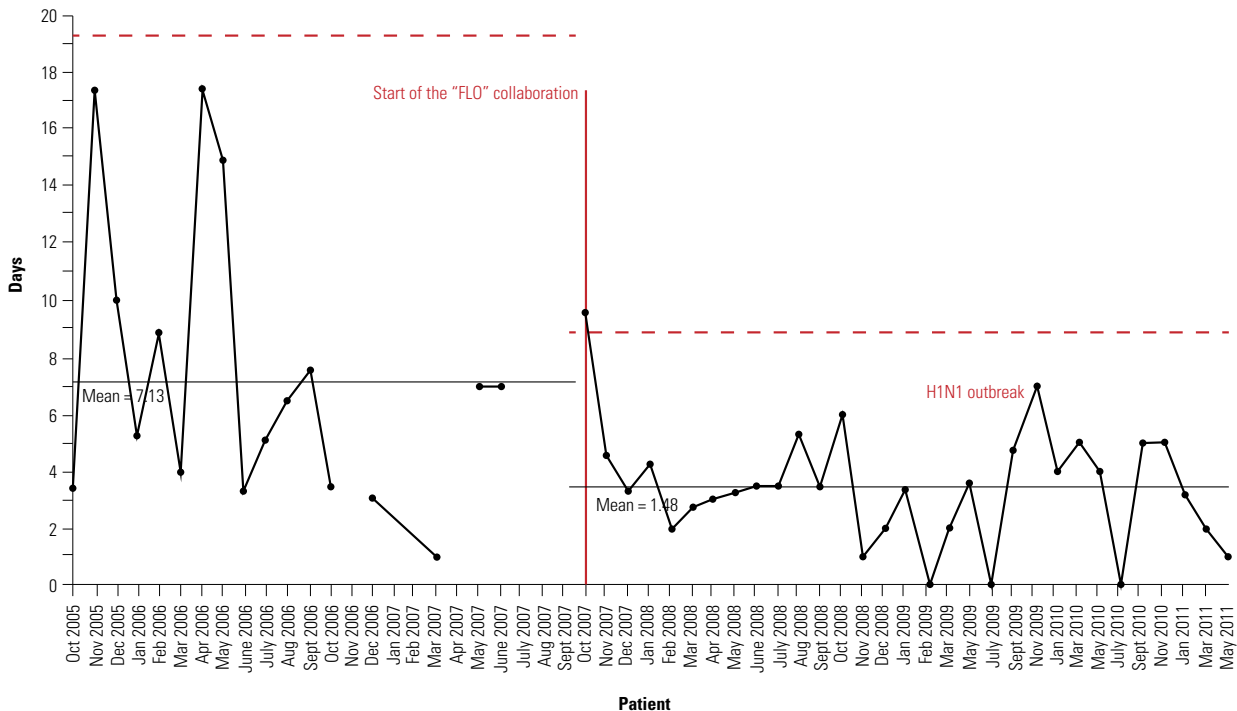
Concurrent progress at SickKids included the improvement of the existing patient identification board, with the intent to

augment communication within the inter-professional practice team. Previous practice had been for all communication regarding patient transfers to be documented in different sections of the patient chart, making ready access somewhat difficult. It was therefore decided to make the communication board magnetic and increase it in size to incorporate extra columns – one of which was dedicated to the Holland Bloorview transfer process. Magnets were developed to graphically depict where patients were in the transfer process, from questioning whether Holland Bloorview is appropriate to ending with an ambulance to indicate transfer day. Prior to this change, there was no centralized location to display information regarding the transfer process.

Results

SickKids has the capacity to monitor delays in access and transition and is able to track the number of medically unnecessary days through the Medical Care Appropriateness Protocol (MCAP). This protocol is a bed use tool developed by the Oak Group (Wayland, Massachusetts) and adopted several years ago at SickKids. MCAP includes a set of criteria that provides information about the patterns of in-patient bed use and enables the identification of areas of efficiency, effectiveness and improve-

FIGURE 3.
Reduction in the number of medically unnecessary days



LCL = lower control limit; mR = moving range; UCL = upper control limit.

ment. Baseline data were initially gathered at the launch of the partnership. Subsequently, when improvements were implemented and tested, MCAP was used as one of the measures to track reductions in the number of medically unnecessary days of care on the neurosciences and trauma unit while patients awaited transfer to Holland Bloorview's BIRT.

To date, the efforts and outcomes of this partnership have exceeded expectations. The team was successful in reducing the number of medically unnecessary days from a mean of 7.13 to 2.99 days per patient, representing a 58% reduction; this exceeds the original target of 50% (Figure 3).

As well, the time required to process a referral to Holland Bloorview has been reduced from four people and 72 hours to one person and one hour (Figure 4). These changes have now resulted in SickKids sending more appropriate referrals in a shorter period of time, and allowed Holland Bloorview to make more timely decisions regarding acceptance of patients into their programs. In the past, the process from initiation of referral to acceptance into the program took up to eight days, with multiple people engaging in several phone calls, faxing and photocopying. Presently, the referral process is now completed in approximately four days, involves half the number of people

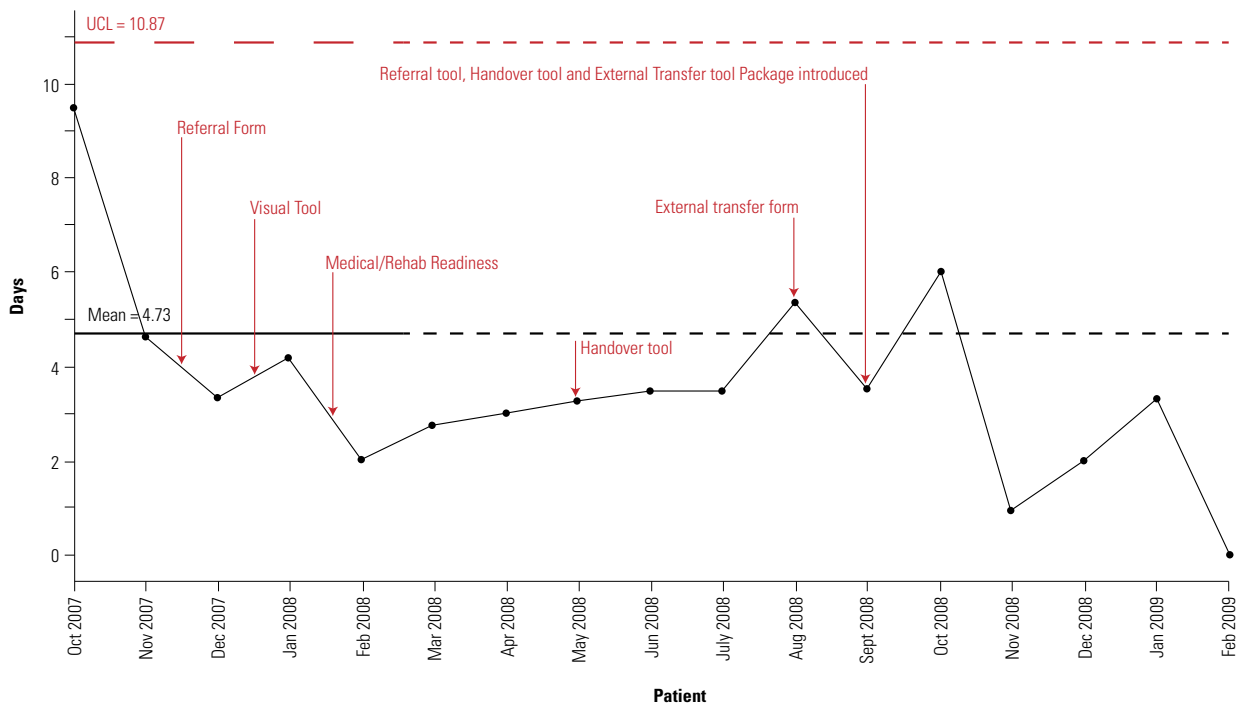
and has all but eliminated extraneous photocopying and faxing.

Lessons Learned

Reflecting on this partnership, there are a number of lessons learned that others may find helpful when considering such an initiative:

- Developing clear collaborative goals and checking back with the group on a regular basis to ensure the group stays on track
- Spending time understanding each organization's perspective, culture and values, to promote the sharing of a common vision and commitment to follow-through
- Using the model for improvement PDSA cycles as a framework for developing, testing, learning and refining the initiative before final implementation
- Focusing on process issues as well as tasks to enhance inter-professional collaboration
- Pre-booking meetings to accomplish goals and specific activities, and to help build and maintain momentum
- Always keeping the needs of clients and families at the forefront as a way to establish common ground when making decisions and resolving conflict

FIGURE 4.
Comparison of time to complete new referral form versus old referral form



LCL = lower control limit; mR = moving range UCL = upper control limit.

- Engaging organizational, physician and senior leadership support to help reduce barriers and obstacles that may occur
- Focusing on strategies to facilitate spread and sustainability

Critical Success Factors


Factors considered critical to the success of this partnership and felt to be instrumental in replicating this initiative elsewhere include strategic leadership as well as the creation of a highly functioning improvement team. With regard to the former, a Steering Committee was established including physician and senior leaders from Holland Bloorview and SickKids. This committee met on a monthly basis and helped to ensure that the infrastructure was in place to facilitate the work of the improvement team, and that the respective boards at each organization were made aware that the Flo Collaborative was an organizational priority focused on improving access to services for clients and families.

In terms of the Improvement Team, recruitment of membership focused on people who were committed and actively engaged and who had the skills and influence to facilitate change at both organizations. Members had to demonstrate a systematic, focused approach to their work, including an unwavering commitment to achieve the expected deliverables. There also needed to be demonstrable respect for the individual culture of each organization as well as an understanding and enactment of the principles of effective team functioning. Members were challenged by senior leaders to continually seize opportunities to profile their work externally and to celebrate their successes with their colleagues, maintaining momentum and laying the foundation for spread and sustainability. To continue the gains that have been realized, the referral process time as well as the medically unnecessary days for SickKids patients awaiting transfer to Holland Bloorview will continue to be tracked and reported. The Steering Committee remained in place, even after the official close of the Flo Collaborative project, in order to support these gains as well as “spread” improvement to further units at SickKids and Holland Bloorview. Subsequent oversight has since transitioned to the operational leaders at SickKids and Holland Bloorview.

Conclusions

Throughout the course of the collaborative, the Kids in Transition team identified and tested several improvement initiatives, including the development of standard definitions for *medically ready* and *rehabilitation ready*, the use of visual clues to identify pediatric neurosurgery patients who are ready for transition and the simplification of the Holland Bloorview referral form. Results far exceeded expectations, and the partnership and outcomes continue to be sustained due to the focused effort on staff education, ongoing communication (formal and informal) and the development of guidelines and ongoing measurement that have helped to “hardwire” the improvements

in the transition process. In addition to the impressive numbers associated with reducing medically unnecessary days, there have been collateral benefits that contribute to the continued success of this partnership and the desire to engage in further cross-organizational improvements. The staff at SickKids and at Holland Bloorview have gained a greater understanding and respect for the perspectives, culture and values that are held at the other organization. The experience has helped promote a common vision with enhanced commitment and accountability to make sure that staff, physicians and leaders continue to collaborate to ensure safe, timely and effective access to care.

Currently, we have successfully spread the Flo initiative to the orthopedic, cardiac and endocrine/transplant units, with plans to incorporate all other SickKids units. 

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A young boy with short, light-colored hair is the central figure. He is wearing a sweater that is black on the left side and yellow on the right side, and pants that are black on the left and yellow on the right. The entire scene is rendered in a watercolor style with soft, blended colors and splatters of blue and yellow. The background is a mix of light beige and white tones.

System Change

Beneficial change can
inform and inspire other
system level changes

Canada and the World: A Comparative Approach to Injury Prevention

Pamela Fuselli and Amy Wanounou

Canada is consistently ranked as one of the best places to live in the world. A crucial part of this view is based on Canada's approach to public health, which has achieved measurable results in the rate reduction of some leading causes of disease and death. It is therefore surprising to learn that in tackling the leading cause of death for Canadian children and youth, Canada ranks a disappointing 18th of 26 nations in the Organisation for Economic Co-operation and Development (UNICEF 2001). Few are aware that unintentional injury is the leading cause of death for Canadian children and youth between the ages of one and 14. In Canada, injury kills more children and youth than all disease (Canadian Institutes of Health Research 2008). Unintentional injuries are a leading public health issue that directly impacts the health, well-being and quality of life of those injured, as well as their families, communities and greater society. Nevertheless, injury is often neglected, and investment is rarely equal to the magnitude of the problem. The reality is that injury prevention has not kept pace with other public health interventions such as tobacco control or infectious disease prevention programs. Despite its devastating impact, injury remains an invisible epidemic.

If Canada enjoyed the same child injury rate as Sweden, from 1991 to 1995 (SMARTRISK 2005)

- 1,233 children would not have died,
- between 23,000 and 50,000 would not have been hospitalized and

- more than 250,000 children would not have visited emergency rooms.

Injury prevention policies are urgently needed to reduce overall healthcare costs and improve the health of Canada's population. Proactive investment and comprehensive strategies in injury

The first step ... lies in acknowledging the crucial role injury plays in overall health. It is, after all, the leading cause of death.

prevention can make a significant difference in the overall health of the population. Governments, industry and society overall pay a high price for failing to address injuries, which are largely predictable and preventable.

A comprehensive and holistic approach that includes education, enforcement and environmental changes as well as an injury prevention strategy with commitment from the federal, provincial and territorial governments are urgently needed to reduce injuries. Lessons in effective injury prevention strategies can be learned from other provinces, such as Nova Scotia, as well as from countries such as Sweden and others in the European Union that have invested in and implemented national injury prevention strategies that have resulted in increased awareness, positive public policy and reductions in injuries over time.

In this article, we lay out the current position of injury prevention in the Canadian and global contexts. By using a comparative approach that incorporates existing findings from Canadian provincial and international contexts, the article provides a comprehensive review of the growing need for an injury prevention strategy in Canada and its potential impact on the Canadian healthcare system.

This article also comes on the heels of a new opportunity that, should it be seized, will undertake concerted and coordinated action in order to reduce the burden of injury in Canada. The federal government in Canada recently pledged its commitment to a national injury prevention strategy for children in the 2010 Speech from the Throne. In this speech, then-Governor General Michaëlle Jean read the following statement: “To prevent accidents that harm our children and youth, our Government will also work in partnership with non-governmental organizations to launch a national strategy on childhood injury prevention” (Government of Canada 2010).

Injury Prevention as a Child Health Indicator

The first step in recognizing injuries and adopting measures to reduce their rate in Canada, particularly unintentional injuries in children and youth, lies in acknowledging the crucial role injury plays in overall health. It is, after all, the leading cause of death. Internationally, efforts have been under way, and have recently increased, to recognize injuries as a key child health indicator. In September 2000, the United Nations adopted a series of Millennium Development Goals (MDGs). The fourth of these goals is the reduction, by two thirds, of the mortality rate in children under five years between 1990 and 2015 (World Health Organization [WHO] 2006). Recently, concerns have been raised about the expectation of achieving these reductions, primarily because a large proportion of the remaining deaths are due to preventable injuries, a factor that has, to date, not been included in the MDG plan.

This concern comes at the same time as the absolute numbers and rates of child and adolescent injury and death in low- and middle-income countries are rising. The combination of increasing incidence and recent success in reducing other causes of death, particularly infectious diseases, means that the significance of injury is growing such that it now figures prominently among the list of leading causes of death in children and adolescents (WHO 2006).

Scope of the Invisible Epidemic

The scope of the injury epidemic is daunting, both internationally and in Canada. Injury and violence are major killers of children throughout the world, responsible for approximately 950,000 deaths annually in those under the age of 18 years. Unintentional injuries account for almost 90% of these cases (WHO 2008). The majority of the fatal injuries to children under the age of 18

years in 2004 were the result of road traffic collisions, drowning, fire-related burns, falls and poisoning (WHO 2008).

The picture looks remarkably similar in Canada. Every year in Canada, on average close to 300 children aged 14 and under are killed (Figure 1) and another 21,000 are hospitalized for serious injuries (Figure 2). Each day, nearly 60 children are admitted to a hospital for an injury (Public Health Agency of Canada 2009).

Children are not small adults.

Children are not small adults. Their abilities and behaviour differ from those of adults. Children’s physical and mental abilities, degree of dependence, types of activities and risk-taking behaviours all change substantially as they grow older. But as children develop, their curiosity and need to experiment do not always match their ability to understand or to respond to danger, leaving them at risk for injury (WHO 2008).

When a child is injured, the magnitude of the impact is felt in all levels of society. Unintentional injuries cost Canada’s healthcare system approximately \$4.2 billion in direct system costs annually, with an additional \$4.5 billion in secondary costs. Another \$4 billion in direct and indirect healthcare costs are specifically related to unintentional injuries in children and youth (SMARTRISK 2009).

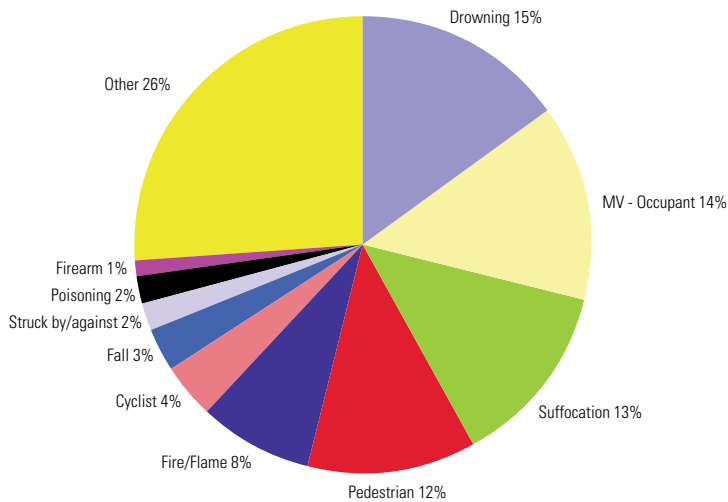
The impact of injury on these children is often lifelong. For injury survivors, the need for care and rehabilitation of the injury and the potential for permanent disability can have far-reaching impacts on their health, education and social inclusion and on their parents’ livelihood. Many are left with ongoing physical, mental or psychological disabilities, and these have a major impact on their own lives as well as the lives of their families (WHO 2008).

Injury also tends to require a disproportionate allocation of health resources and places immediate and unplanned demands on the system. No part of the healthcare system is untouched by injury; even wait times for some services are affected. Community-based care, family physicians, emergency medical services, the acute care system and rehabilitation services are all involved in responding to the short- and long-term impacts of injury (Department of Health Promotion and Protection and Injury Free Nova Scotia 2009).

Injury Prevention Saves Money

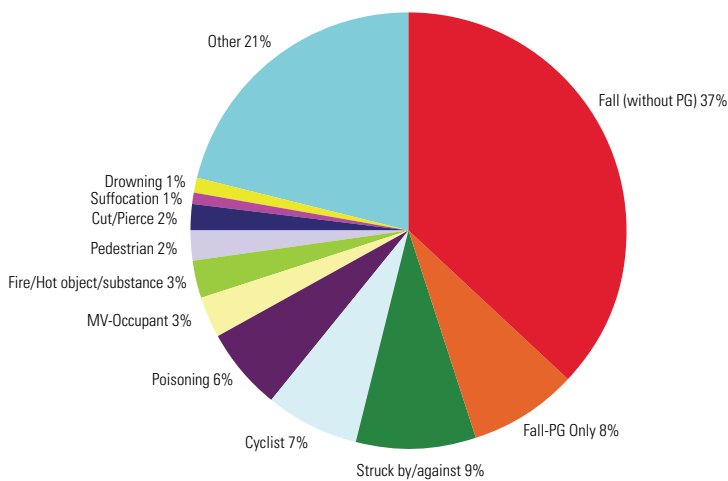
The cost of doing nothing when it comes to the prevention of unintentional injuries in children and youth is unacceptable. In 2004, the most recent year for which data are available, injuries cost Canadians \$19.8 billion and 13,667 lives. That same year, the direct costs of injury were \$10.72 billion and the indirect costs were \$9.06 billion. Crucially, unintentional

FIGURE 1.
Leading causes of unintentional injury deaths among Canadian children ages 0–14, in 2000–2005



MV = motor vehicle.
 Source: Data from Public Health Agency of Canada (2009).

FIGURE 2.
Leading causes of injury hospitalizations among Canadian children, ages 0–14 years, 2000–2005



MV = motor vehicle; PG = playground.
 Sources: Data from Public Health Agency of Canada (2009) and Canadian Institute for Health Information (2009).

permanently disabled (SMARTRISK 2009).

The cost of primary programs is much cheaper than treating a child, sometimes for months, because of a preventable injury. Effective strategies for injury prevention have been shown to save not only lives but also dollars (Gyllensvard 2010; SMARTRISK 2009; WHO 2005a). The numbers are illuminating. The return on investment for every \$1 spent on prevention strategies shows that prevention is extremely cost-effective (SMARTRISK 2009); for example,

- \$1 spent on bicycle helmets saves \$29,
- \$1 spent on child safety seats saves \$32,
- \$1 spent on road safety improvements saves \$3,
- \$1 spent on prevention counselling by pediatricians saves \$10 and
- \$1 spent on poison control services saves \$7.

Furthermore, studies have shown that, on average, a \$46 child safety seat generates \$1,900 in benefits to society; a \$31 booster seat generates \$2,200; and a \$10 bicycle helmet generates \$570 (Pacific Institute for Research and Evaluation 2005).

What an Injury Prevention Strategy Looks Like

Addressing the invisible epidemic of injuries in Canada requires a multi-faceted approach that engages several sectors to work together in coordinated action. There is no doubt that injury prevention strategies are effective in reducing the rate and burden of injury on societies. In countries that have adopted injury prevention strategies and programs, injury rates have halved over a 20-year period, largely attributed to concerted prevention efforts (WHO 2006).

While the healthcare sector manages the outcome of injury, the prevention strategies that have been proven effective require coordination between sectors. As a result of the need for intersectoral action, a

injuries account for 81% of all injury costs. On a human level, over 211,000 Canadians were hospitalized, there were over three million emergency room visits and over 67,000 Canadians were

strategic and coordinated effort is required to address the issue and ensure it receives adequate investment that will lead to meaningful reductions. The best approach is the development

of a government-endorsed strategic plan with specific action steps outlined, including the identification of resources and organizations responsible – in essence, a “road map” or action plan (EuroSafe 2007).

Several examples of injury prevention strategies exist to guide Canada in the adoption of its own approach. Two examples are highlighted here. The first is in Nova Scotia, where the provincial injury prevention strategy has been effective in coordinating activities among multiple sectors in the province to reduce the rate of injuries. The second is the European context, and the leadership and coordination taking place within and between countries for injury prevention.

Injury Prevention in Nova Scotia

In 2006, Nova Scotia’s injury prevention strategy was recognized by WHO as an example of a successful sub-national injury prevention policy (Department of Health Promotion and Protection and Injury Free Nova Scotia 2009). The current strategy in Nova Scotia is a revision of the original strategy enacted in 2004 and builds heavily on the successes achieved to date. The purpose of the strategy is to serve as an integrated and comprehensive guide for collective efforts in the province to create healthy communities and thereby reduce injuries.

Furthermore, the strategy takes a holistic approach to injury by seeking to reduce the physical, emotional and economic impacts of injury. This holistic approach is critical to effective injury prevention strategies everywhere and is linked to the growing need to acknowledge the central role the social determinants of health play in well-being, related to injuries and beyond. *Social determinants of health* refers to a broad range of socio-economic factors that affect health and well-being, including injury risk. Factors include family income, maternal education, single parenting, maternal age, the number of children, the number of household occupants, the type of housing and the level of overcrowding.

The impacts of the social determinants of health and socio-economic status on injuries in children and youth are a widely acknowledged reality (Burrows et al 2010; Canadian Institute for Health 2009; EuroSafe 2006; WHO 2006). Injuries are unevenly distributed between countries, and within countries between socio-economic groups, to the detriment of more disadvantaged families and communities (Burrows et al. 2010). Children living in poverty are more likely to be exposed to hazardous environments, including high-volume, fast-moving traffic, a lack of space and facilities for safe play, cramped living conditions with no proper kitchen, open cooking fires, unprotected windows, open roofs and stairs without handrails (WHO 2006).

In Canada, there exists a strong correlation between socio-economic status and the risk of injury-related death among children (Birken et al. 2006). Children in low socio-economic levels are more than twice as likely to die of injury as are children

in high socio-economic levels (Macpherson et al 1998). In a comparison of low- and high-income areas, hospitalization rates due to injuries were high among those with low socio-economic status (Canadian Institute for Health).

In 2004, the direct costs of injury were \$10.72 billion and the indirect costs were \$9.06 billion.

In addition to incorporating the role of the social determinants of health, Nova Scotia’s injury prevention strategy successfully leverages several key elements important to its success. Leadership from the provincial government, including a \$4.5 million investment into the strategy, helped create the multi-level action needed to achieve results. A series of short-, intermediate- and long-term measures were established as indicators of success, and these are instrumental to tracking progress over time and allow Nova Scotia to identify challenges, develop solutions and celebrate success along the road to reducing the burden of injury.

Finally, the guiding principle of Nova Scotia’s injury prevention strategy was rooted in the Three Es approach to injury prevention: education, enforcement and engineering. This approach allows for the promotion of specific attitudes about injuries through targeted awareness campaigns; the creation and enforcement of laws, regulations and policies; and engineering seeking to alter the environment, including the design of products, to decrease the risk of injury. These three elements are apparent in some of the recent injury prevention initiatives in the province. Nova Scotia is the only province in Canada with an all-ages, all-wheeled helmet legislation mandating the use of protective head gear. Nova Scotia’s Trauma Registry is a comprehensive, province-wide surveillance program that conducts population-based surveillance of major trauma. The province’s comprehensive child passenger safety initiatives have included coordination and collaboration across sectors, including booster seat legislation, educational campaigns and collaboration with law enforcement at the community level.

Injury Prevention in Europe

As in Canada, the relationship between injury rates and socio-economic status is present in the international context. More than 95% of all unintentional childhood injury deaths occur in low- and middle-income countries. Within the high-income countries, there is also a strong socio-economic gradient of child and adolescent injury, with children from poor families being considerably more likely to sustain an injury than their more affluent counterparts (WHO 2005).

The European Child Safety Alliance of EuroSafe is composed of 18 member countries and has instituted the Child Safety

Action Plan Project, a large-scale initiative whose aim is to develop government-endorsed injury prevention national strategies across Europe. EuroSafe recommends the same measures found in Nova Scotia in strategizing to reduce injuries. These include developing a coordinated national action plan that includes multi-sectoral action, ensuring investment commensurate with the magnitude of the problem, addressing socioeconomic inequalities, adopting evidence-based good practices and enhancing capacity in the injury prevention field to implement effective strategies. To facilitate the implementation of injury prevention strategies that work, EuroSafe developed Child Safety Report Cards as an assessment and grading tool for member countries. The report cards reflect the current level of adoption, implementation and enforcement of evidenced good practice policy in specific countries, and provide a way to identify strengths, weaknesses and gaps in injury prevention.

If all member states were to adopt the proven good practice policies, 90% of injury deaths could be prevented.

In comparison to 2007 results, the 2009 EuroSafe Child Safety Report Cards found general improvements for all member countries. Further, the report cards demonstrated that countries that traditionally had lower injury rates – Sweden, the United Kingdom and the Netherlands – all had relatively high overall performance grades and, in particular, high scores for leadership, infrastructure and capacity (EuroSafe 2009). In general, countries that use a combination of broad approaches, in addition to encouraging a culture of safety and displaying strong political commitment, have made the greatest progress in reducing their child injury burden. EuroSafe estimates that if all member states were to adopt the proven good practice policies, 90% of injury deaths could be prevented. Thousands of children's lives would be saved each year (EuroSafe 2009).

Conclusion

Further action is being taken in the international context to address the invisible epidemic of injuries. The resolution was officially passed and adopted on May 24, 2011. The resolution states that it will be difficult to achieve MDG four, to reduce child mortality, in some countries without addressing child injury. The resolution calls for member states to

- prioritize the prevention of child injury and ensure that necessary intersectoral coordination mechanisms are established or strengthened;

- ensure that funding mechanisms for public health programs for child survival or child health cover child injury prevention; and
- implement as appropriate the recommendations of the WHO/UNICEF world report on child injury prevention, among others (WHO 2011).

The resolution also requests that the director-general of WHO collaborate with United Nations organizations, international development partners and non-governmental organizations (NGOs) to establish a mechanism for communication and coordination of child injury, and to support capacity building, data collection and emergency care within member states, among other initiatives.

The promising movement on injury prevention taking place internationally presents a prime opportunity for Canada to join the effort to reduce the burden of injury for all Canadians, particularly children and youth. As highlighted at the outset of this article, the government of Canada has recently stated its commitment to adopting a national child injury prevention strategy. What are needed now are the tools and mechanisms to make such a strategy a reality.

Through the perseverance of NGOs, provincial injury prevention organizations and a small but dedicated group within the federal government, Canada has realized some success in the fight to prevent injuries. Several initiatives are in place across Canada and reflect the Three *E*s approach to injury prevention. The Canadian Hospital Injury Report and Prevention Program collects and analyzes data on injuries from 15 hospitals across Canada. Coordination and information sharing through networks is taking place through avenues such as the Canadian Collaborative Centres for Injury Prevention and the Atlantic Collaborative for Injury Prevention. Efforts are also under way to modify the environment to make it as injury proof as possible, most notably through the recent passage of Bill C-36: An Act Respecting the Safety of Consumer Products (Government of Canada 2011).

While many provinces and territories have strategies for injury prevention, Canada continues to seek national leadership and coordination on this issue, and a commitment to address this epidemic. These can be better achieved with human resources and funding at a level more in line with the burden of injury on society – and more in keeping with resources dedicated to other comparable health issues, including resources to sustain a “home” to lead an evidence-informed pan-Canadian strategy for injury prevention. A strategy should include leadership in data collection and surveillance; coordination and collaboration; injury prevention research; collaboration with NGOs to broker knowledge in Canada; the development of a strategy to engage potential stakeholders to encourage full investment and

engagement; and the increase in awareness of and attention to the injury problem in Canada.

In the period 1995–2004, Canada's injury death rate decreased by 10%. Effective interventions are known, and many can be implemented quickly. With growing government engagement and support for effective injury prevention programming, it is possible to make even more significant gains in the decade ahead. The ripple effect an injury has on a child and the family extends into Canadian society at large. "In Canada, there are more than 5 million women of childbearing age and their children will add to the 8 million children and youth in Canada that represent the future of our country" (Canadian Institutes of Health Research 2010: 8). When it comes to the safety and health of Canada's children and youth, the cost of inaction is simply too high. **HQ**

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Fetal Fibronectin Testing in Ontario: Successful Government-Sector Collaboration to Achieve High-Quality and Sustainable System Change

Charlotte Moore Hepburn and Marilyn Booth

Abstract

Ontario's province-wide implementation of fetal fibronectin (fFn) technology, a test to identify women unlikely to deliver within two weeks of presentation with symptoms of preterm labour, is a notable example of evidence-informed system improvement and productive government-sector partnership. Increasing demand for costly, high-risk maternal and newborn care in Ontario hospitals prompted a provincial review. Sector experts identified potentially avoidable maternal admissions and transfers to high-risk units for evaluation of suspected preterm labour as an opportunity for system improvement. Limited access to fFn testing was documented, and expert consensus posited that funding rapid clinical testing to identify women at low risk for preterm delivery would yield a significant return on investment. An expert panel recommended evidence-based clinical guidelines. The government swiftly secured funding and initiated a successful implementation strategy, capitalizing on regional perinatal networks. Amassing clinical and care utilization information, framing the data in a policy-relevant context and partnering sector expertise with ministry capability resulted in this technology being effectively implemented in a complex health system.

Ensuring that the right patient is in the right place at the right time to receive the appropriate level of care is critical to achieving timely, high-quality healthcare for all and to ensuring appropriate resource use across the system. With the demand for costly healthcare services increasing, opportunities that simultaneously achieve an optimal clinical outcome, a superior patient experience and a maximal return on investment are in demand. System change ideas that facilitate improvements in care while enhancing health system sustainability are well received by decision-makers and provide opportunities to strengthen government-sector relations and develop enduring infrastructure to support continuing health system advancement.

The implementation of province-wide fetal fibronectin (fFn) testing, a component of a larger strategy designed to stabilize the high-risk maternal-newborn services sector in Ontario, is an example of a highly successful system change idea. After the development of a compelling clinical and health services business case for new investment in this well-studied technology, the Ontario Ministry of Health and Long-Term Care (MOHLTC) partnered with sector leadership to develop a comprehensive execution strategy. This partnership prompted

ongoing discussion regarding the capacity for continuous health system improvements for the maternal-child population. This article describes the effective implementation of fFn technology in a complex health system, highlighting how the challenging social and fiscal contexts initiated the dialogue on system change; how the government-sector relationship facilitated an efficient, evidence-based implementation plan; and how enduring regional infrastructure allowed for rapid and cost-effective health system improvement.

The Ontario Landscape

Preterm birth rates in Canada have increased from 6.4% in 1981 to 8.2% in 2004 (Public Health Agency of Canada 2008) due to the combined pressures of increases in maternal age, rates of multiple births (both spontaneous and as a result of assisted reproduction; Millar et al. 1992) and rates of obstetrical intervention (Joseph et al. 2002). Accompanied by population growth, this changing epidemiology has challenged the capacity of high-risk maternal and newborn centres to meet this rising demand. Over the past decade, more and more patients were sent out of the region, out of the province and, in some cases, out of the country to receive care that should have been provided close to home. These high-risk transfers peaked in 2007 and captivated media attention with a series of high-profile newspaper articles detailing the lack of available high-risk maternal and neonatal care in Canada (Priest 2007). In this environment, the Ontario MOHLTC commissioned a review of the capacity of Level III neonatal intensive care units (NICUs) in Ontario (Agnew Peckham 2007).

Ontario's Level III NICU Capacity Review

The Ontario Level III NICU capacity review clearly detailed a shortage of total available bassinets and staff available to operate them. This shortage was considered responsible for not only the high number of out-of-region and out-of-country transfers but also the high occupancy rates that restricted the system's ability to accommodate surges. In addition to documenting the need for investment to increase total capacity, the review identified opportunities to maximize the appropriate use of and/or decrease demand for these highly specialized and expensive services. The implementation of province-wide cervico-vaginal fFn testing was highlighted as one strategy for maximizing the appropriate use of high-risk obstetrical beds.

fFn Testing

Cervico-vaginal fFn testing is indicated for women with symptoms of threatened preterm birth prior to advanced cervical dilation. The absence of fFn is a strong indicator that preterm birth is unlikely to occur. More specifically, a negative test confers a more than 95% likelihood that the woman will remain "undelivered" for the subsequent 14 days (Leitich and

Kaider 2003; Malak et al. 1996; Peaceman et al. 1997). This information is critically important to enabling an evidence-informed decision to admit, transfer to a higher level of care or discharge a woman presenting with threatened preterm labour. The use of this technology allows women potentially requiring admission to be identified and those who can safely be monitored as outpatients to avoid unnecessary, costly, disruptive and stressful hospitalizations.

During the 15-month study period, over \$200,000 was saved in avoided air ambulance transfers.

Prior to the provincial rollout of fFn technology, only half of Ontario's maternity hospitals offered fFn testing (Provincial Council for Children's Health [PCCH] 2009). In a comprehensive survey, with 88 of 99 maternity hospitals responding, the high cost of the test and the need for substantial provider education (to ensure consistent, evidence-based application of the technology) were highlighted as major barriers to the implementation of the testing in the absence of a provincially sponsored initiative. Importantly, a willingness to implement the technology if appropriate funds and training were made available was echoed by the majority (PCCH 2009).

While randomized controlled trials focusing on resource impact are lacking, a growing body of literature suggests that the successful implementation of fFn testing may result in a reduction in the number of avoidable preterm labour admissions, maternal transfers, maternal length of stay and use of tocolytic agents and corticosteroids (Dutta and Norman 2010). While reports of the technology's impact on total cost savings have been mixed (Musaad et al. 2005) and calculations of actual financial savings are difficult to compare due to variation in both methodologies and healthcare funding systems in different jurisdictions, select Canadian centres have published encouraging preliminary results. In one small, Canadian prospective cohort study, not only were the rates of admission and admission durations positively affected following the implementation of fFn technology, but the costs per patient were significantly reduced. With no change in the preterm birth rate, declines occurred in admission rates (from 24.1 to 12.1%), lengths of stay (from 5.2 to 0.6 days) and the mean cost per patient with threatened preterm labour (from \$3,666 to \$581, $p < .0001$; Abenhaim et al. 2005). During the 20-week study, there was an overall reduction in total cost from \$102,660 to \$26,169. In a second Canadian study examining the impact of fFn on healthcare use in Nunavut, a retrospective chart review revealed that, during the 15-month study period, over \$200,000 was saved in avoided air ambulance transfers, with no false-negative

or negative clinical results recorded (MacDonald et al. 2007).

In reviewing this literature, it is clear that fFn technology provides a promising opportunity to reduce reproductive healthcare resource use without compromising maternal or neonatal outcomes. In addition, women and their families experience reduced disruption, decreased stress and fewer lengthy separations when able to avoid unnecessary admissions and transfers. This is particularly the case for women living in rural and remote locations. The simultaneous pursuit of an improved health outcome, an enhanced care experience and reduced healthcare cost represents the Triple Aim approach defined by the Institute for Healthcare Improvement and seen as the foundational direction of a high-value healthcare system (Berwick et al. 2008). Triple Aim requires providers, institutions and policy decision-makers to innovate, generating solutions to healthcare challenges that evolve beyond the “more and more of what we already have” mantra of dated health system stabilization thinking. Finding new ways of delivering health service to our population – recognizing that *more* is not always *better*, and that *different* can stimulate more meaningful, transformative change – is essential as we face the challenge of long-term health system sustainability.

Dialogue between Government and the Provincial Council for Maternal and Child Health

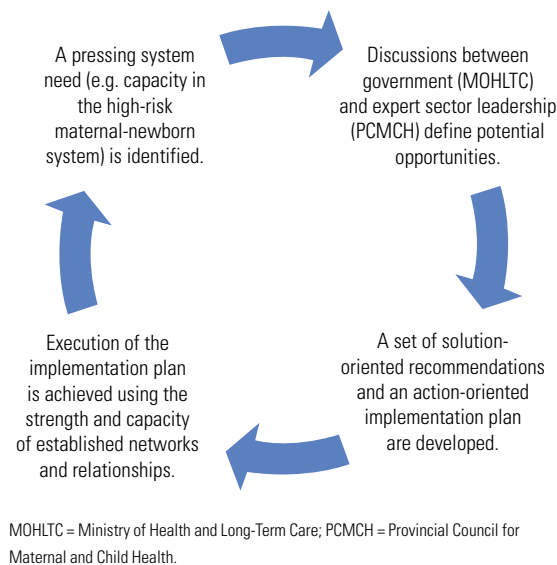
In March 2008, continuing concerns about the maternal-newborn system in the province led PCCH and MOHLTC to convene a Maternal-Newborn Advisory Committee (M-NAC) to counsel PCCH on the optimal system of care for mothers and newborns in Ontario. The mandate of M-NAC is to recommend strategies to achieve a coordinated system of maternal and neonatal services sensitive to urban, rural and remote settings. Strategies focus on the following:

- Equitable access to timely, high-quality, evidence-based, family-centred care at the appropriate level for all pregnant women and newborns in Ontario, as close to home as possible
- Equitable access to specialized services optimizing maternal and newborn care
- Leading evidence-based practice and standards of care
- Data and information systems to inform practice and policy and to promote accountability

This action was one of the catalysts for a review and expansion of the mandate and membership of PCCH in order to align with the government’s broader strategic discussions about maternal, child and youth health. In the summer of 2008, a task force with government and sector representation recommended the evolution of PCCH to the Provincial Council for Maternal

and Child Health (PCMCH; Figure 1). The council has been given two distinct roles. First, it is to be an expert advisory body, responding to the needs of MOHLTC and other ministries on issues, priorities and strategies for the maternal, child and youth healthcare system in Ontario. Secondly, it is to be a resource to the maternal, child and youth healthcare system designed to support system improvement and to influence how services are delivered across all levels of care.

FIGURE 1. Collaboration between government and the health sector to implement a plan for improvement



Creation of the Expert Panel

One of the first initiatives undertaken by M-NAC was to convene an expert panel tasked with recommending an implementation strategy for province-wide fFn testing. Sitting M-NAC members nominated content experts from across the province in the areas of perinatal care, primary care, laboratory services, education and administration to populate the expert panel. Membership selection was based on expertise and reflected diversity of both disciplines and geographical regions. Deliberations began in August 2008.

The panel met three times by teleconference or in person, supplemented by e-mail correspondence. In order to avoid duplication of effort and to leverage the experience of other jurisdictions, fFn testing implementation leads in British Columbia, Alberta and Nova Scotia were interviewed regarding their experience with models for funding, purchasing, distribution, clinician and provider education and system-level evaluation.

Numerous fFn guidelines from across Ontario, Nova Scotia, Alberta and British Columbia were reviewed. In addition, the 2007 Canadian national fetal fibronectin guidelines (a project of the Canadian Perinatal Programs Coalition [CPPC], which included a comprehensive literature review) were evaluated. With CPPC's permission, their review was updated and information was added from a focused search targeting articles published between 2003 and 2008 and research detailing the impact of fFn testing on resource use. Furthermore, literature regarding all other available technologies that screen for preterm labour was reviewed and used to inform the technology recommendation of the expert panel (PCCH 2009).

Following deliberations, the expert panel recommended that CPPC's *Fetal Fibronectin Guideline for Use in the Management of Preterm Labour* (2007) be adopted with modifications to better reflect Ontario's needs and the current literature. These guidelines have become the Ontario standard and are available on the PCMCH website at www.pcmch.on.ca.

The panel also recommended that MOHLTC support the immediate implementation of fFn testing, in all Ontario hospitals providing birthing services, through the following actions:

- Promoting the use of fFn testing
- Funding the purchase of analyzers for those Ontario hospitals without this equipment
- Funding test kits for all hospitals providing birthing services
- Supporting the dissemination and implementation of PCMCH's *Fetal Fibronectin Guideline for Use in the Management of Preterm Labour* (2008)
- Establishing an evaluation plan to determine the impact of fFn testing on resource use and patient outcomes (PCCH 2009)

One of the challenges in enabling equitable access to fFn testing is ensuring consistency with the First Nations Inuit Health Branch (FNIHB), the government body responsible for health planning for First Nations and Inuit populations. The expert panel liaised with FNIHB in order to understand the availability of fFn testing in the regions covered by FNIHB and to ensure that FNIHB was aware of the recommended service standards and educational materials created to support the Ontario strategy (PCCH 2009).

The expert panel's report was submitted to MOHLTC in December 2008 and the ministry took immediate steps toward implementation, starting January 2009. Capital funds for analyzer purchases were distributed by March 2009, with accompanying pro-rated funds for the test kits, based on historical volumes. Funding for test-kit supplies was secured for fiscal 2009–2010 onwards. In addition, MOHLTC provided the necessary monies to contract with an active project manager, the Child Health Network for the Greater Toronto Area, to

ensure the successful execution of the implementation plan. This network worked with other regional perinatal networks, appointing an fFn coordinator in each network to assume responsibility for working with hospitals within the geographical region to maximize the uptake of both the test and the supporting evidence-based clinical guidelines.

Recognizing that *more* is not always *better*, and that *different* can stimulate more meaningful, transformative change is essential.

Strategies that supported the successful implementation included the following:

- A workshop with the appointed regional coordinators to prepare them for their role
- Regular teleconferences to monitor implementation and problem solve any emerging issues
- The development of tools including educational presentations and videos, policy and procedure templates capable of being customized by each hospital, and staff and patient educational materials
- A tracking tool to monitor fFn use at the hospital level

All implementation materials are available on the PCMCH website.

As of March 1, 2010, 103 of 109 hospital sites were using or indicated their intent to use fFn testing. Of the six hospitals that declined to adopt fFn testing, most reported a very low level of birthing activity or are in the process of transferring this service out of the institution.

The implementation of fFn testing across Ontario was both effective and efficient as a result of (1) pre-existing communication networks established through the regional networks; (2) the ability to leverage the connections across regional networks for the establishment of a team of regional coordinators to design and implement a roll-out strategy; and (3) dedicated, active project management funded by the government with resources available to support the regional implementation activities.

PCMCH and MOHLTC are committed to ensuring a rigorous evaluation of the impact of making fFn testing available provincially. An evaluation, funded by the government, is nearing completion.

Conclusions

Ontario's implementation of fFn testing is an example of effective system change. fFn technology offered an opportunity to improve clinical care quality and the patient care experience while simultaneously enhancing system sustainability. As shown

through this example, such valuable initiatives can be used to “set the stage” for continued system improvement. In the years to come, it is likely that similar opportunities to meet coincident quality and cost-effectiveness goals will emerge. The swift adoption of these future technologies can be facilitated through vehicles such as PCMCH, an organization with a productive, long-standing relationship with government, able to quickly harness sector leadership and expertise and able to efficiently link with regional network infrastructure to facilitate rapid knowledge translation. **HQ**

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Training Care Teams of Children with Autism Spectrum Disorders in Positive Behaviour Support: An Innovative Approach

Shawn Reynolds, Shane Lynch and Sandy Litman

Abstract

As part of a team, the authors developed a workshop to help parents and teams address the behavioural needs of children with autism using a positive behaviour support (PBS) approach. Teams received comprehensive training in PBS and completed weekly homework assignments. Measures of participant satisfaction, parent satisfaction and efficacy and child behaviour suggested this training as an effective intervention for these teams. Participants reported improvements and the effective implementation of strategies after involvement in the workshops. This innovative model suggests potential for teams struggling with communication challenges in addressing problem behaviours in children with autism.

In the greater Edmonton region, the Joint Action for Children Committee (JACC) is an intersectoral working group of administrators from child and youth servicing organizations that provide health, education, protective and support services to children, youth and their families. The purpose of JACC is to improve the coordination of services and outcomes for families and the agencies that serve them in this region. In response to increasing reports of crises being experienced by families of children with autism, JACC developed a pilot project in 2010 that focused on building capacity in families and their care teams in effective behavioural support. This article describes an innovative training initiative aimed at

increasing the knowledge and fluency of a behaviour intervention framework for children with autism.

Autism is a developmental disability characterized by three core areas of impairment: difficulty relating socially to others; difficulty communicating effectively and at an age-appropriate level; and the use of repetitive and stereotypical patterns of behaviour (American Psychiatric Association 2000). As a result of these difficulties, individuals diagnosed with autism are at an increased risk of developing and continuing to use problem behaviours (Bradley et al. 2004). It is understood that the problem behaviours serve a communicative function, and interventions that focus on teaching functionally equivalent, alternative ways of communicating are the most successful interventions (e.g., see Carr and Durand 1985). Current “best practices” in the remediation of problem behaviour focus on (1) teaching alternative behaviours, (2) restructuring environments to avoid problem behaviour and (3) reinforcing the use of appropriate behaviour (National Research Council 2001). These intervention strategies are components of a larger system of support known as positive behaviour support (PBS).

“Positive behavior support refers to the broad enterprise of helping people develop and engage in adaptive socially desirable behaviors and overcome patterns of destructive and stigmatizing responding” (Koegel et al. 1996: xiii). In contrast to traditional approaches of behaviour modification that used aversive techniques to limit problem behaviours, PBS focuses on

building socially appropriate skills and supporting individuals' use of "positive" behaviours (Durand and Carr 1985; Meyer and Evans 1989). PBS aims to teach individuals who use problem behaviour a broader range of skills to enable more effective interactions with their environment. Systematic reviews have shown that PBS is an effective intervention for problem behaviour for individuals with autism (National Autism Center 2009; National Research Council 2001).

Following a scan of the published literature, individuals fluent in PBS assembled the learning objectives and organized the curriculum. The curriculum package included the following topics:

- Effective team functioning (e.g., collaboration, goal setting)
- Understanding autism spectrum disorders
- Behavioural learning theory
- Functional behaviour assessment methodologies
- Designing multi-component behaviour support plans
- Data-collection systems (e.g., hypothesis testing, monitoring, evaluating)
- Selecting and teaching appropriate alternative and replacement behaviours
- Intervention strategies for improving environmental fit (e.g., antecedent and consequent manipulations)
- Promoting skill maintenance and generalization
- Non-violent crisis intervention strategies

The final training curriculum was consistent with other reports of essential elements of PBS training (Dunlap et al. 2000; Horner et al. 1999; Reid and Parsons 2004).

Description

Between April 2010 and March 2011, a total of 35 teams (203 participants, including 30 parents) entered the program. Training occurred during three full days and two follow-up half-days over the span of seven weeks. Teams were composed of at least one parent and a wide range of professionals organized around that parent's child. Self-identified titles included teacher, home support worker, educational assistant, mental health therapist, psychologist, speech-language pathologist, social worker, principal, respite worker, special education facilitator, occupational therapist, registered nurse and learning services facilitator. Attracting this range of professionals was intentional, and a major goal of the workshop was to share information across a spectrum of providers who could, in turn, share learned knowledge with their colleagues. Approximately five teams participated in each workshop (range one to six), and there was a total of eight workshops.

Two or three individuals performed workshop facilitation in each session, and one of the first two authors (S.R. or S. Lynch) co-facilitated each of the workshops. New facilitators

were always paired with a more experienced facilitator to help ensure workshop fidelity (i.e., that participants across groups would receive essentially identical formal training).

In the results presented below, *session* and *session day* refer to an individual day or half-day of training. *Team* refers to the three to seven individuals who came to the training to address the needs of a single child. *Group* refers to the four or five teams in each training session. Finally, *season* refers to the set of workshops given in the same season (spring 2010, fall 2010 or winter 2011).

Method

All workshop participants were given two brief measures (described below) to complete at the end of each session. Other measures were given to the parent (and for one measure, the group coordinator) before and after the training was completed. All participants were informed that the completion of these measures was optional. Ethics approval for this study was obtained in 2010.

Measures

Measures involving all participants (both parents and staff) completed at the end of each session included the following:

- Attendance – to assess satisfaction and interest in training by participant behaviour
- Weekly Workshop Evaluation (WWE; internal measure) – to assess satisfaction with the workshop, as well as homework completion and comprehension
- Team Functioning Questionnaire (TFQ; internal measure) – to assess how team members perceived the functioning of the team they were in, from their own perspective as well as those of others

One measure was given at the end of the final session:

- Final Workshop Satisfaction Survey (FWSS; internal measure) – to assess overall satisfaction with the workshop upon completion

The following pre-post measures were completed by parents:

- Parenting Sense of Competence scale (PSOC; Johnston and Mash 1989) – to assess parenting efficacy and satisfaction from the parents' perspective pre-post treatment
- Parenting Stress Index (PSI; Abidin 1995) – to assess parents' stress across a range of areas from the parents' perspective pre-post treatment
- Aberrant Behavior Checklist (ABC; Aman and Singh 1986) – to assess child behaviour and challenges from the parent and coordinator perspective pre-post treatment (note: this

measure was also completed independently pre- and post-workshop by a staff member)

The return rate of in-session questionnaires was 77% (714 from 931 participants, across the five sessions and nine groups) for the WWE and 62% (580 from 931 participants) for the TFQ. For other measures, pre- and post-measures were received on the PSOC for 23 of 28 (82%) completing parents, on the ABC from 18 (64%) and on the PSI from 12 (43%). The ABC was completed pre- and post-training by 28 (85%) of 33 completing school staff.

Results

Attendance

Overall attendance across groups was reasonably steady, suggesting that participants found the training useful. Thirty-three of the 35 (94%) groups who started the training completed it (one parent withdrew consent for her team, whereas another parent stopped attending). Including the two non-completing teams, attendance in sessions two to five was approximately 90% of the attendance in session one. Declines primarily occurred in the final two sessions; this may have been related to these being half-day rather than full-day sessions.

Weekly Workshop Evaluation

On the WWE, choices for each question included “not at all” (coded as 1), “a little bit” (2), “mostly” (3) and “completely” (4). Percentages regarding satisfaction noted below include those responding “mostly” or “completely.”

Overall satisfaction from the WWE was high, with 97% saying they were satisfied with the day’s training. A total of 85% felt that the day’s session improved their skills in addressing the needs of the team’s child. As well, 88% were satisfied with their opportunities to discuss autism facets and strategies with others. These results suggest that the capacity to address the behavioural challenges discussed in that session was increasing. However, only 67% felt the workshop improved their understanding of autism. This is not surprising, given that many participants were already well versed in autism, either as a professional or a parent.

In terms of topic coverage, 96% were satisfied with discussion of the two main areas presented each day. This suggests that participants did indeed understand the focus of the presentations.

Ninety-eight percent felt they understood the homework assigned between sessions, and 90% felt confident that they could attempt the homework, suggesting that the assignments were realistic in size and scope. The previous week’s homework was completed by 83%, with 81% feeling successful with what they completed. Across participants, 91% felt there was enough time in the class devoted to the discussion of homework from the previous week.

Changes were seen across seasons ($F[2, 701] = 12.95, p <$

.001), with overall satisfaction rated more highly in the two later seasons (mean = 3.60 for both) than in the first (mean = 3.38). This is not a surprising finding as the quality of the workshop could be expected to improve as facilitators became more comfortable with material presented.

Across all sessions, parent ratings from the 89 parent WWE forms (mean = 3.58) were at similar levels to those of the other 476 participants (mean = 3.50; $t[563] = 1.25, p > .10$).

Team Functioning Questionnaire

On the TFQ, choices for each question included “strongly disagree” (coded as 1), “somewhat disagree” (2), “neutral” (3), “somewhat agree” (4) and “strongly agree” (5). Percentages noted below include those responding “somewhat agree” or “strongly agree.”

On the TFQ, participants consistently agreed with positive statements about team functioning (93% overall; grand mean = 4.60), with agreement on each of the 14 items above 90% (item means ranged from 4.47 to 4.74). Moreover, 74% of all items were marked as “strongly agree.” When averaging across all items, no trends were observed across seasons ($F[2, 575] = 1.32, p > .10$); however, group differences were found ($F[8, 569] = 4.25, p < .001$). This pattern suggests that there were no differences in team functioning based on facilitator experience, but that individual groups did show differences (subjectively, this is most likely related to pre-workshop team functioning levels). Parent ratings were again at similar levels to those of other team members (mean = 4.603 versus 4.598; $t[535] = 0.05, p > .10$).

Final Workshop Satisfaction Survey

A total of 130 of 168 (77%) participants on the final workshop day completed the FWSS. Results were similar to those found in the WWE measures: 96% indicated satisfaction with the workshop series, and across items 88–98% indicated satisfaction. On an item querying the level of presentation (e.g., too complicated versus too simplistic), 85% described it as “just right,” with the remaining 15% equally describing it as either too complicated or too simplistic. On an item querying the mix of expert presentation versus opportunities to interact with the team, 73% described that mix as “just right,” with a larger number indicating a desire to interact more with their team (22%) than to focus more on the speakers (6%). As noted above, there was no significant difference between parent satisfaction (mean = 3.55) and staff satisfaction (mean = 3.58; $t[127] = 0.25, p > .10$).

Parenting Sense of Competence

Twenty-three parents completed the PSOC measure pre- and post-training. The overall score significantly improved from pre- to post-treatment ($d = 0.68, t[22] = 3.63, p = .001$). Individual subscales assessing satisfaction ($d = 0.54, t[22] = 2.74, p = .012$) and efficacy ($d = 0.61, t[22] = 3.04, p = .006$) likewise showed

improvement. These findings suggest that parent impressions of their ability and their satisfaction with parenting improved significantly upon completion of this training.

Parenting Stress Index

Only 12 parents completed the PSI pre- and post-training, and results were not significant overall. Subjectively, parents often were uncomfortable with the personal questions and length of this measure in comparison with the other measures given. Child challenges as assessed by the Child Domain index decreased mildly, approaching significance ($t[11] = 1.78, p = .104, d = 0.31$). Stress, as assessed in the Parent Domain, did not decrease ($t[11] = 0.03, p > .5, d = .003$), suggesting that the level of stress experienced by parents did not change as a result of this training.

Aberrant Behavior Checklist

A total of 18 parents and 28 team members completed the ABC pre- and post-treatment. A consistent pattern was seen on the total score of this measure (sum of the five subscale scores), with parents ($d = 0.43$ [effect size of change pre-post treatment], $t[17] = 1.80, p = .090$) and team members ($d = 0.31$; $t[27] = 2.57, p = .016$) suggesting mild to moderate improvements. These would hopefully increase over time, given improved parent confidence and new parent-team strategies. Improvements were reported at a slightly higher level by parents, though statistical significance at the .05 level was attained only by team members, likely due to the larger sample size in that group.

Qualitative Comments

On the WWE, participants were given an opportunity to provide open-ended general comments about the training that day. A number of themes were identified in these comments. Some reflected general satisfaction (e.g., “Thank you. Next year will be much more successful because of all you’ve taught”; “Thank you for all the extremely valuable information”). Some participants made comments that were specific to their own team (e.g., “It was good to have more than half our time discussing our own plan”). A few comments were related to pragmatic issues (e.g., “4:30 p.m. is too late; a few people were fading”; “The pace of today’s session was too fast”). In general, the comments on the forms reflected the results of questionnaires as well as general impressions from the presenters that participants were largely satisfied with the content of the presentations though some practical issues could be addressed in future sessions.

Discussion

The goal of this workshop series was to help parents and teams that support children with autism learn PBS strategies to address problem behaviours. We found that teams attending this workshop reported satisfaction with the information learned in the training and were able to show good team interaction and

functioning. Parents attending reported improved confidence and effectiveness in addressing behaviours with their children. Parents and teams reported some improvement in child behaviour on a global measure across the seven weeks of training.

The outcome measures from this workshop support the subjective comments and impressions gained during the workshop facilitation. We observed teams working well together on activities given in the workshop, and toward the end of the workshops teams reported many anecdotal comments suggesting improved behaviour in children.

Although it has been shown that the strategies contained within the workshop are considered best practice (National Research Council 2001), it is unlikely that the success that we observed (teams implemented strategies and reported success using objective behavioural tracking [e.g., see O’Neill et al. 1997]) was solely the result of learning the PBS curriculum. Teams seemed to also benefit from having extended time for discussion and this increased opportunity to work together. Many team members reported that given the financial constraints within the education system, individuals rarely get the opportunity for such involved and extended discussions as an entire team. Thus, one of the factors that likely contributed to the success of this training was the model itself: the opportunity to receive mentorship as well as thoroughly discuss PBS strategies as a unified team.

In presenting the workshop, we found several nuances that required skilful facilitation. These included an awareness of when teams were struggling with a topic as well as assisting teams in interpreting clinical anecdotes from school settings or therapy sessions. In addition, it seemed that a dynamic presentation style was needed to fully engage the teams and maintain that engagement over such an extended period of time. Finally, we found that a very solid understanding of autism and PBS were needed by facilitators in order to work through issues and barriers identified by teams. While we are considering wider dissemination of this material, we believe it is critical to have at least one facilitator who possesses all of these skills. We suspect that running the workshops with only one facilitator would be very difficult and less effective, though this was not tested.

We were pleased with the improved levels of parent satisfaction and perceived competence (at a moderate effect size) that occurred after the workshop, in only seven weeks. Future research may address whether such gains can be maintained on a long-term basis. We were gratified that global behavioural gains were reported at home and at school (at a low to moderate effect size), and suspect that a measure that focuses on the specific behavioural goals of a parent and team would yield stronger results than the global ABC measure (which invariably includes some items that are not applicable to the child from the outset).

A key and relatively unique feature of this intervention was that cross-sectoral teams received training and that parents received the same training as the professionals and paraprofes-

sionals. The intention was that all of the team members would learn and use the same language and strategies when dealing with a particular child. The behaviour plans that were put into place and the discussions at the tables during the workshops were indirect evidence that this intention was realized. One parent noted that this was the first time that she felt that she was a member of the team. This cross-sectoral approach was facilitated (and funded) by the intersectoral working group JACC. Such groups that cross ministerial jurisdictions and work together to find innovative solutions to challenges that affect them all offer promising new collaborative approaches to dealing with complex issues that affect children and their families.

Future research may investigate the amount of facilitation and mentorship that teams require in order to implement the PBS strategies with high fidelity. We are considering providing the workshop material with a much lower level of facilitation; while we are hopeful that doing so will be highly effective, we are somewhat skeptical that the switch to PBS strategies will actually occur without direct facilitation and team time together. Additional research may also offer insights into how to best capture the potential success of such a novel PBS training model. In the present investigation, data collection focused on assessing the training model. Data were collected on team functioning, workshop satisfaction, parenting stress levels and feelings of competence and general levels of child behaviour. Not included in the analyses were the quantitative or qualitative aspects of the problem behaviours that initially brought the teams to the training. Moreover, the goal of PBS as an intervention is to replace children's problem behaviours with more socially appropriate behaviours. As problem behaviours are eliminated, there should be a concomitant increase in the use of positive behaviours. This innovative model features the importance of an interagency and interdisciplinary collaborative approach in working with students with severe challenges, and emphasizes the value of including families as members of the care team. **HQ**

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Reflections on Knowledge Translation in Canadian NICUs Using the EPIQ Method

Catherine M.G. Cronin, G. Ross Baker, Shoo K. Lee, Arne Ohlsson, Douglas McMillan, Mary M.K. Seshia and the Canadian Neonatal Network EPIQ Study Group

Appendix. The Canadian Neonatal Network EPIQ Study Group

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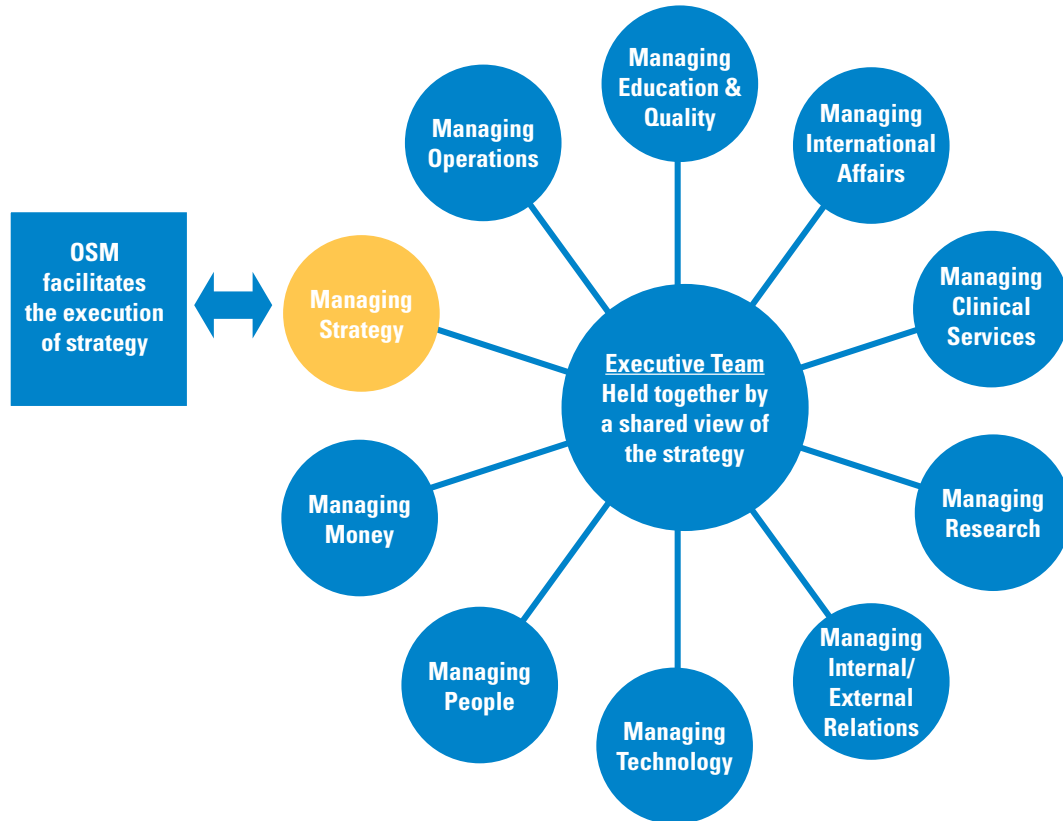
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Managing Strategy to Enhance Care for Children

Aaron Smith, Jeff Mainland and Irene Blais

FIGURE 1.
Managing Strategy as a corporate function



OSM = Office of Strategy Management.

FIGURE 2.
SickKids Strategy Map

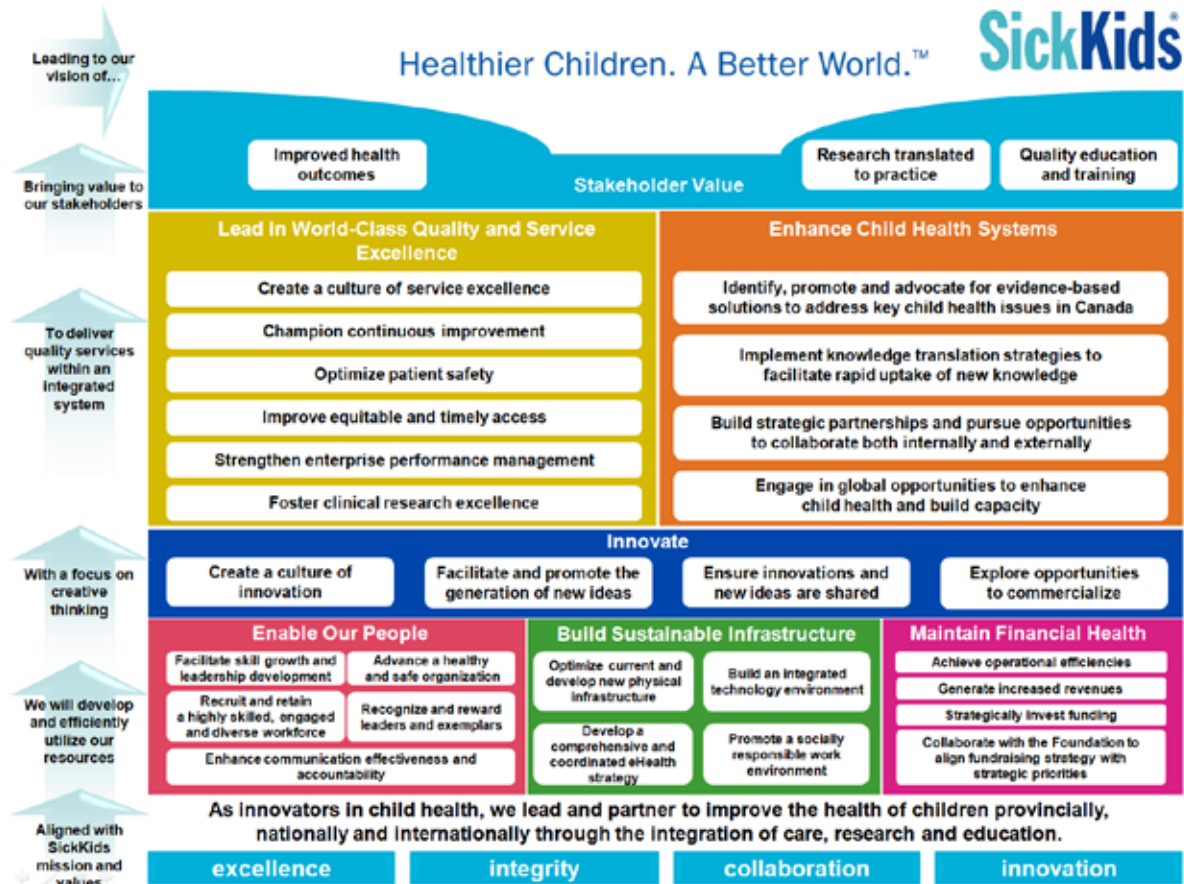


FIGURE 3.
SickKids Scorecard*



SickKids Scorecard

Summary - 2010/11 Q4 - year to date results as at May 24, 2011

	Key Performance Indicator (KPI)	KPI Description	Strategic Objective(s) KPI Measures	Unit of Measure	2009/10 Actual	2010/11 Target	2010/11 Q4 Actual	Variance
Stakeholder Value	Pain Management Satisfaction	Percentage of positive responses (Good, very good, excellent) on patient satisfaction survey regarding pain management in inpatient units	Improved health outcomes	Percent	78.3%	75.7%	78.6% Q3 ytd	1.2%
	Unplanned Readmission Rate	Unplanned readmissions from previous acute admissions where diagnosis is the same/related within 28 days	Improved health outcomes	Percent	6.4%	6.5%	7.5% Q3 ytd	15.4%
	Trainee Satisfaction	Evaluation of postgraduate medical education student experiences including both rotation effectiveness and teachers' effectiveness	Provide quality education at all levels	Annual Number	4.24	TBD	4.26	Q3 Reporting
Lead in World-Class Quality & Service Excellence	Communication Effectiveness	Percentage of positive responses (good, very good, excellent) to the Information, Education and Communication questions on patient satisfaction survey	Create culture of service excellence	Percent	78.1%	78.0%	76.1% Q3 ytd	-2.4%
	Inpatient Patient Satisfaction	Percentage of inpatient survey responses with a score of 3 (good), 4 (very good), or 5 (Excellent)	Champion continuous improvement	Percent	98.4%	98.0%	97.5% Q3 ytd	-0.5%
	Emergency Department Patient Satisfaction	Percentage of Emergency Department survey responses with a score of 3 (good), 4 (very good), or 5 (Excellent)	Champion continuous improvement	Percent	84.9%	92.0%	91.4% Q3 ytd	-0.7%
	Hand Hygiene Compliance	Percentage of observed correct practice based on total observed opportunities for hand hygiene. Direct observations are routinely performed in observation rooms of all inpatient units and Emergency Department	Optimize patient safety	Percent	77.0%	75.0%	74.9%	-0.1%
	Medication Reconciliation	Percentage of medication reconciliation completed during patient admission process (based on number of charts reviewed)	Optimize patient safety	Percent	78.0%	80.0%	82.0%	2.5%
	Emergency Department Length of Stay for Admitted Patients	Percentage of Emergency Department (ED) patients admitted within 8 hours from arrival to ED	Improve equitable and timely access	Percent	36%	45%	38.4%	-14.7%
	Surgical Out-of-Window Wait Times	Percentage of surgical cases completed outside of nationally accepted timelines	Improve equitable and timely access	Percent	31.8%	20.0%	21.5%	7.5%
	MRI Wait Times	Appointment wait times in weeks for MRI patients requiring general anaesthesia	Improve equitable and timely access	Weeks	N/A	12.88	8.80	-31.5%
Enable Our People	Health and Safety Compliance	Supervisor response rate to 1) JQHSC recommendations, 2) Employee Safety reporting incidences and 3) Fit testing compliance	Advance a healthy and safe organization	Percent	84.6%	80.0%	84.8%	6%
	Organizational Engagement	Organizational Engagement survey results representing employees' perceived relationships with their organization	Advance healthy work environment	Percent	N/A	65.0%	72.6%	12%
	Job Engagement	Job Engagement survey results representing employees' perceived relationship with their day-to-day work	Advance healthy work environment	Percent	N/A	73.0%	75.4%	3.3%
Build Sustainable Infrastructure	Waste Diversion Rate	Percentage waste diversion for all buildings	Promote a socially responsible work environment	Percent	38.0%	43.0%	42.0%	-2.3%
	Energy Consumption Reduction	Percentage reduction of total steam & electricity usage for all buildings year-over-year	Promote a socially responsible work environment	Percent	1.6%	1.5%	-5.8%	Over 100% increase

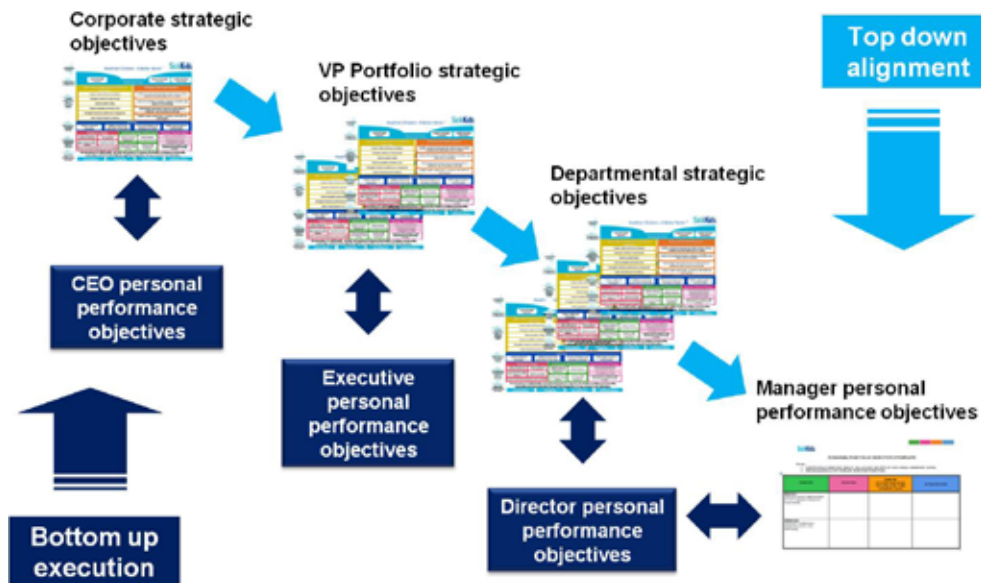
JQHSC = Joint Occupational Health and Safety; MRI = magnetic resonance imaging; Q = quarter; TBD = to be determined; ytd = year to date.

*Publicly reported.

FIGURE 4.
Cascading SickKids strategy

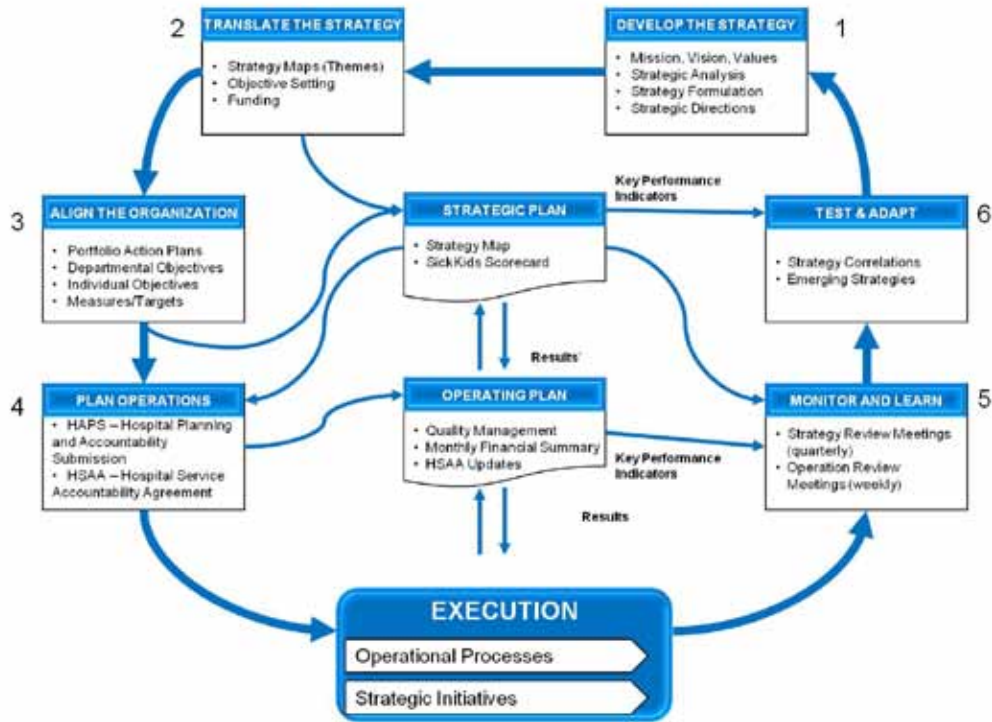


FIGURE 5.
Enterprise and personal performance management system cascade



CEO = chief executive officer; VP = vice-president.

FIGURE 6.
SickKids' closed-loop management system linking strategy and operations



Source: Adapted from Kaplan and Norton (2008).