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CIHR Institute of Health Services
and Policy Research

EVIDENCE IN ACTION,
ACTING ON EVIDENCE

A casebook of
health services and policy research
knowledge translation stories

CIHR IRSC

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CIHR MANDATE

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's agency for health research. CIHR's mission is to create new scientific knowledge and to catalyze its translation into improved health, more effective health services and products, and a strengthened Canadian health care system. Composed of 13 Institutes, CIHR provides leadership and support to close to 10,000 health researchers and trainees across Canada.

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The CIHR Institute of Health Services and Policy Research (IHSPR) is dedicated to supporting innovative research, capacity-building and knowledge translation initiatives designed to improve the way health care services are organized, regulated, managed, financed, paid for, used and delivered, in the interest of improving the health and quality of life of all Canadians.

FOREWORD

Knowledge translation (KT) is a broad concept, encompassing all steps between the creation of new knowledge and its application to yield beneficial outcomes for society. Successful KT strategies can include linkage and exchange, communication and education, policy change, and program and practice improvement initiatives.

CIHR's vision of successful KT is the exchange, synthesis, and ethically-sound application of knowledge within a complex set of interactions among researchers and users—to accelerate the capture of the benefits of research for Canadians through improved health, more effective services and products, and a strengthened health care system. A core element of CIHR's knowledge translation strategy is to support and recognize KT excellence, and to act as a KT resource for Canada.

In early 2005, the CIHR Institute of Health Services and Policy Research issued a call for knowledge translation "stories" that illustrated both successful and less than successful examples of the collaborative development and practical use of health services and policy research. We wanted to encourage and recognize KT activity and provide a vehicle for publishing and sharing lessons from KT experiences.

We also wanted to highlight the potential impact of health services and policy research evidence in shaping policy and practice change. There is growing interest among health services organizations, individual researchers, and decision makers in learning more about KT experiences that lead to a greater understanding of KT in action and its better practices.

We invited individuals, teams, and organizations working in health care services and policy, particularly in the national priority areas for research and knowledge translation identified in *Listening for Direction II,*[*] to contribute to this KT Casebook.[†] Cases were selected based on review of the abstracts submitted.

The collection represents a broad cross-section of experiences—from the preliminary development of partnerships for future knowledge translation in Aboriginal communities, to the use of established knowledge translation networks to rapidly respond to a community in crisis. Widely-acclaimed KT models, like SEARCH Canada, PRISMA and Manitoba's *The Need to Know* Team, are showcased, but the Casebook also highlights efforts to develop new kinds of partnerships: between researchers and community-based organizations; between researchers and advocacy groups; and between multiple partners and dedicated KT brokers and champions.

The cases in this Casebook are first-hand, personal stories. We asked contributors to be frank about their successes and failures, and to report, from their own experiences, what worked, what didn't and the lessons they learned. This Casebook is not intended to be a replacement for insights gained from systematic reviews of the growing knowledge translation literature. But many of these stories echo common themes about conducting KT in the Canadian context.

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[*] *Listening for Direction II* was a national consultation on health services and policy issues for 2004-2007. The final report is available at http://www.cihr-irsc.gc.ca/e/20461.html.

[†] The CIHR Institute of Population and Public Health, in partnership with the Canadian Population Health Initiative, has concurrently produced a Knowledge Translation Casebook.

Lessons learned

- **Effective KT requires long-term, sustained relationships.** Such relationships are rarely well supported by current funding models and mechanisms. Some of the most successful examples of KT have leveraged existing relationships into funded programs with embedded KT aims. But in the initial stages of a KT initiative, competitive funding cycles can create unrealistic timelines for building trust, understanding, and common goals. This is particularly the case for activities with community partners, where a significant front-end investment in time may be required to establish mutual understanding of unfamiliar contexts, needs, and expectations.

- **KT activities are nourished by face-to-face interactions.** In almost all of the cases profiled here, some form of in-person interaction between partners was crucial for success. Personal contact with practitioners is the most valuable form of KT, particularly in training and educational initiatives. Yet it is also one of the most costly and time-consuming elements of a KT strategy, and again, often not adequately supported through existing funding models.

- **KT is often conducted off the side of the desk.** Frequently, KT is sustained by little more than a personal commitment to the research, to practice change, or to a community, and with full recognition that these activities are unlikely to be recognized by academic promotion and tenure committees. Without belittling the need for change in this area, it is also worth noting that one of the benefits of working in a partnership is the resulting synergy that can help fill resource gaps and provide less tangible "job satisfaction."

- **KT activities alone are often not enough to effect change.** KT must take place within supportive organizational climates. Decision-making partners must have an interest in the research and the capacity to absorb evidence. They must understand its implications for the specific decision-making environment and be interested in engineering evidence-based change. Executive-level buy-in is crucial for KT designed to effect program and policy changes. Building individual capacity to develop and use research knowledge has far greater benefit within an organization that encourages individuals to use such knowledge to make practice and program improvements.

- **Peer-initiated change plays a major role.** One important organizational element to consider, particularly for training and education initiatives, is the role of peer-initiated change. At least three cases in this Casebook focus on activities that utilize respected peers to promote the uptake and use of research knowledge to influence practice change. Outside of an individual organization, front-line practitioners can also independently pilot new, evidence-based practices and facilitate their uptake through peer networks and member associations.

- **KT activities can be too successful.** It is encouraging, in one way, that the authors of two cases in this Casebook were compelled to note that KT activities can be too successful. Partner organizations can implement research findings prematurely, or respond wholeheartedly to identified problems before the necessary research is complete. These important lessons signal a welcome maturity in the current level of KT being conducted across the country.

We hope that this Casebook becomes a valuable resource for the diversity of health services and policy research communities in Canada. While we intend that this will be the first of many such efforts to illustrate health services and policy research-related knowledge translation in Canada, it is a pilot project, and will be evaluated for its usefulness as a source of information about KT in action. We therefore welcome your comments on content, presentation, distribution, or any other aspects of this project.

Morris Barer
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KNOWLEDGE TRANSLATION AND PATIENT SAFETY: THE CANADIAN ADVERSE EVENTS STUDY

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The Canadian Adverse Events Study was the first national study of adverse events in Canadian hospitals. Learning from the controversy surrounding similar studies in other countries, the team engaged in extensive knowledge translation (KT) activities throughout the life of the project. Using meetings, web-based communication, and other tools, the team successfully prepared most Canadian stakeholders for the study release, allowing them to develop anticipatory patient safety initiatives. However, upon publication, the policy spotlight quickly shifted to other issues and the long-term commitment needed to create safer health care is still uncertain.

Background

In the spring of 2002, a group of researchers from seven universities across Canada received funding for the Canadian Adverse Events Study,[1] the first national study of adverse events in Canadian hospitals. Adverse events are unintended injuries or complications that result in disability, death, or prolonged hospital stay, and are caused by the care that patients receive, not an underlying disease or condition.

Studies of adverse events in other countries have uncovered unanticipated levels of injury—and have often had unexpected effects. Premature announcement of the results of the Australian study by the country's federal minister of health soured relationships between the Australian Medical Association and the federal government for several years. In the United States, the Harvard Medical Practice Study had little policy impact when it was released in 1991. But data from this and other studies became a major news story in 1999 when they were used to create the headline-grabbing press release of a report from the Institute of Medicine (IOM) that stated between "44,000 to 98,000 Americans die in hospitals each year as a result of medical errors."[2]

Recognizing that the Canadian study would likely have a major impact on health care organizations and professionals, the funders—the Canadian Institute of Health Information (CIHI) and CIHR—worked with the research team to develop a KT strategy designed to prepare Canadian stakeholders for the release of the study.

The KT initiative

The goal of our KT strategy was to ensure that decision makers, representatives of the health professions, health system managers, and through them, the general public, would be informed of the study and its progress on an ongoing basis. Bringing these groups together would also stimulate each organization's efforts to develop appropriate responses to the study and anticipatory initiatives.

Our activities began with the distribution of a media release to over 1,500 media sources in French and English Canada shortly after funding for the study was awarded. In June 2002, an invitational forum was held in Ottawa for national stakeholders. The focus was on sharing knowledge from similar studies carried out in other jurisdictions, and on defining issues that the study might generate for each organization. CIHI also opened an interactive website to update stakeholders on the progress of the research, which was maintained during the entire project.

Despite the large number of media stories across the country, few Canadians knew much about the adverse events study and its results.

A year later, in May 2003, a second forum for the same group of stakeholders was held to provide an update. Participants were also given an opportunity to work in small groups to share information about their patient safety policy planning and intended responses to the upcoming publication of the study. By this time, a number of organizations had already begun policy and educational initiatives designed to improve the knowledge and skills of practitioners, managers and policy makers about patient safety.

On January 12, 2004, the principal investigators of the study, Drs. Ross Baker and Peter Norton, held a webcast to update stakeholders on the progress. Discussions were already underway at this time with the editors of the *Canadian Medical Association Journal (CMAJ)* to secure an agreement for expedited review and publication of the study.

By mid-April 2004, the study's publication date had been set for May 25, 2004. *CMAJ* policy was to provide the media with embargoed copies of articles appearing in the journal one week prior to publication. So, on May 20, members of the research team and representatives from CIHI and CIHR briefed the press and key stakeholders on the results. The rate of adverse events for patients in Canadian hospitals was 7.5%, higher than that found in similar U.S. studies, but lower than the rate reported in the Australian study. Just as important was the level of disability and death associated with adverse events that indicated a considerable illness burden.

The paper appeared as scheduled on May 25, 2004 in the *CMAJ*, but news of the results were leaked three days earlier when journalists from *The Edmonton Journal* and *The National Post* broke the embargo. Because these papers had published the key results of the study, reporters from other media outlets had to scramble to write stories on different aspects of the findings. Despite this, the study generated significant media coverage. Drs. Norton and Baker each gave approximately 20 interviews, and more than 28 newspaper stories, 47 radio items, and 19 TV news items were written or broadcast about the study. However, the announcement of the federal election that weekend truncated the news coverage. An analysis by CIHI of the perceptions of major news events in that period discovered that, despite the large number of media stories across the country, few Canadians knew much about the adverse events study and its results.

Results of the KT experience

The success of the KT efforts linked to the Canadian Adverse Events Study must be judged by the extent to which key stakeholders were aware of the study results, and by the short- and long-term impacts on patient safety policy initiatives.

In terms of the first question, the level of stakeholder knowledge about the study, the KT efforts were largely successful. Representatives from more than 35 ministries of heath, national professional organizations, regulatory and policy authorities, and non-government organizations attended the two stakeholder forums in 2002 and 2003. A large number also participated in the 2004 webcast. Feedback from the early events was used to improve the interaction between stakeholders and the researchers in later meetings and communications.

> *While practitioners and policy makers were clearly aware of the study and its results, the abbreviated press coverage meant that the public were largely uninformed.*

A count by *CMAJ* showed that the paper was downloaded from their website more than 25,000 times in the first four days after its publication, a level of activity never before seen at the journal. In the year following publication, the study team authors gave more than 50 presentations at meetings of professional groups and health care organizations, and many more presentations to smaller groups of researchers, managers, and practitioners. However, while practitioners and policy makers were clearly aware of the study and its results, the abbreviated press coverage meant that the public were largely uninformed.

Work by many organizations in the two years between the first stakeholder forum and the release of the study helped to advance patient safety efforts across Canada. Policy initiatives and education programs were developed by many professional organizations, including the Canadian Medical Association, the Canadian Nurses Association, and the Canadian Healthcare Association. Following the study's release, the Canadian Council on Health Services Accreditation (CCHSA) created a Patient Safety Advisory Group (which includes both Drs. Norton and Baker, along with other researchers and decision makers). This group has helped CCHSA develop a set of patient safety goals and required organizational practices that will be implemented in accreditation surveys beginning in 2006. Some observers have also speculated that the launch of the Canadian Patient Safety Institute, recommended by the National Steering Committee on Patient Safety in 2002, was pushed forward in late 2003 because of the need to show a federal government commitment to patient safety prior to the release of the study.

Lessons learned

While the study has clearly contributed to the awareness and engagement of many organizations, professional groups, and individual practitioners and managers, there is also the possibility that our KT efforts had the paradoxical effort of desensitizing some parts of our audience.

There is also the possibility that our KT efforts had the paradoxical effort of desensitizing some parts of our audience.

Many organizations worked hard in 2002 and 2003 to develop policies, inform their members, and create media strategies that demonstrated understanding of the issue. In the aftermath of the study's release, and the success of these organizations in their anticipatory efforts, the policy spotlight may have shifted to other concerns. In addition, the federal election was called in the same week as the study's publication, and the issues of waiting times and access were chosen as the key health care platform for the federal Liberal Party's campaign.

Did some organizations believe they had achieved what was needed (or what was possible) for patient safety by May 2004? Did the emergence of waiting times and access as the key health care issues, and the funding that was promised to address them, cut short the focus on patient safety? Did the early involvement of the stakeholder groups in patient safety consultations lead to a waning of enthusiasm for further initiatives once the study results were released?

Did the early involvement of the stakeholder groups in patient safety consultations lead to a waning of enthusiasm for further initiatives once the study results were released?

These questions are difficult to answer. However, recent discussions of the mixed success of the United States in improving patient safety, prompted by the five-year anniversary of the IOM report, suggest that patient safety issues will require continued attention.

Conclusions and implications

The KT efforts centred on the Canadian Adverse Events Study led to a major shift in policy for many Canadian governments and health care organizations. But KT alone has been insufficient to ensure the necessary investment in new resources needed to create safer health care. Other efforts, including the development of the "Safer Healthcare Now!" campaign that targets the reduction of mortality and morbidity from infections and adverse drug events, will be needed to demonstrate and help reduce the gap between current performance and the potential for high reliability health care.

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KNOWLEDGE TRANSLATION FOR PRACTICE CHANGE IN CHILDREN'S MENTAL HEALTH

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In 2000, Ontario mandated the use of two instruments for systematic screening and outcome measurement for children's mental health care organizations. A knowledge translation (KT) infrastructure was developed to support training in, and implementation of, the tools for service providers. Intensive face-to-face training was the mode of KT most valued by practitioners, but was complemented by regional communities of practice and an in-house train-the-trainer approach to facilitate ongoing collaborative professional education and practice change. The tools have now been introduced to over 4,000 practitioners, with uptake in over 90% of organizations.

Background

All too frequently, children receive mental health care that is based on practices that have little supporting evidence or, at worst, poor outcomes.[1,2] Yet there is substantial evidence that most children who receive an empirically supported treatment, get significantly better and do so more quickly than with other forms of treatment or no treatment at all.[3,4]

In 2000, Ontario's Ministry of Children and Youth Services mandated the use of two instruments for systematic screening and outcome measurement as part of a provincial plan for children's mental health. Standardized screening practices in children's mental health can lead to better outcomes, and can help to manage long waiting lists by identifying children at greatest risk.[5] Measuring outcomes can demonstrate which treatments are effective, enhance clinical practice, provide accountability and encourage practitioners to examine service quality.[6,7]

The screening tool, the Brief Child and Family Phone Interview (BCFPI),[8] is a standardized intake instrument to screen behavioural and emotional problems of clinical significance. The outcome tool, the Child and Adolescent Functional Assessment Scale (CAFAS),[9] is a standardized outcome instrument to assess level of functioning and monitor service outcomes.

Both tools are IT-based and clinicians and intake workers require specialized training in their use. The Ontario Ministry of Children and Youth Services contracted with two organizations to deliver this training and support implementation. BCFPI is supported by Children's Mental Health Ontario, an advocacy organization that promotes the well-being of children, youth, and their families and CAFAS is supported by the Community Health Systems Resource Group at The Hospital for Sick Children, in consultation with an advisory group of service providers.

We recognized very early on that transferring knowledge about these new evidence-based tools, and implementing their use in day-to-day work with patients and families, would be extremely challenging.

We recognized very early on that transferring knowledge about these new evidence-based tools, and implementing their use in day-to-day work with patients and families, would be extremely challenging. We therefore developed a formal KT infrastructure[10] to support our training and implementation program, which was a composite of strategies developed from best practices evidence in the research literature, and evolved according to the preferences of our participants and stakeholders.

Six years later, we attribute the success of training, implementation, and adoption of these two tools in over 100 service provider organizations across Ontario to this KT infrastructure, which focused primarily on active stakeholder collaboration including providers, government, and implementers;[11] face-to-face relationships;[11,12] and the use of multiple methods of communication.[13,14]

The KT initiative

Changing the way mental health care is delivered is a formidable, slow-moving task, often requiring modifications in clinician behaviour, program restructuring, and an infusion of resources.[15] With this initiative, organizations were also faced with challenges in accreditation, amalgamation, staff turnover, rising demands for service, and computer literacy.

CAFAS rater reliability training is based around intensive two-day workshops for clinicians, with ongoing website, email, and telephone support. These are delivered regionally by specialized CAFAS trainers and are well received by clinicians.

This personalized approach, while highly effective, is time-consuming and expensive, and cannot meet the differing needs of all service providers in a geographical area. Training requirements occur in waves and are ongoing, due to individual training preferences, the dynamic nature of group learning and professional development and staff turnover.

In recognition of this, we introduced two strategies to facilitate ongoing collaborative professional education, practice change, and KT: regional "communities of practice" and an in-house "train-the-trainer" approach.

Communities of practice can be loosely defined as a group of people who come together, either virtually or in person, around a topic. Our regional communities of practice include Ministry program supervisors, implementers, and practitioners in a unique partnership. The meetings began with our BCFPI and CAFAS teams presenting data from an implementation perspective, but have now evolved to focus on presentations by service providers who share their knowledge on how the tools are being used in clinical practice. Lessons are then transferred to the website where they can be viewed by other users.

> *Changing the way mental health care is delivered is a formidable, slow-moving task, often requiring modifications in clinician behaviour, program restructuring, and an infusion of resources.*

Train-the-trainer sessions focus on training one or two people in each service provider organization to train their own staff on CAFAS rater reliability. The CAFAS team certifies the trainers on an annual basis. We also worked to introduce training of the CAFAS tool into colleges and universities to lessen the training burden of service providers, as well as to develop a culture around outcome management in children's mental health service delivery.

Other KT strategies included the development of guidelines to support the use of the CAFAS tool with special populations, namely Aboriginal children and youth,[16] and communication materials describing the tools and their use to patients and their families.

We also produce aggregate reporting of provincial and regional data generated by the tools to government and service providers to elicit feedback and plan for system change.

Results of the KT experience

Over 4,100 child and youth workers, social workers, psychologists, and psychiatrists have now been trained to reliably use the CAFAS tool. Upwards of 600 specialists have been trained on the BCFPI tool and about 250 workers now apply it across the province. The in-house train-the-trainer approach has proved to be a reliable training method, with high correlations between practitioners trained by on-site practitioner-trainers and those trained by our specialized CAFAS trainers.[17] This initiative has also provided the first ever wait list management tool and outcome data for children aged six to seventeen years who receive mental health treatment.

Our community of practice meetings have been repeatedly well attended and reportedly relevant to participants. Practitioners report increasing buy-in and clinical utility, and service providers report increasing usefulness of data for administrative and quality improvement purposes. Results to date show uptake of the tools in 80-90% of mandated organizations. Practitioners, Ministry personnel, and implementation teams continue to work together to determine current needs for training, support, and knowledge exchange. Research funding is now being sought to evaluate the impact of communities of practice in effecting practice change and the translation of new knowledge about use of the tools in practice.

Lessons learned

This initiative has generated several important lessons about the adoption of evidence-based practices, and the KT strategies required to support them:

- Ongoing, clear, and direct communication is needed from funders, leaders, and champions to all those involved (agency management, clinical supervisors, and front line workers) to fully engage participants in a spirit of meaningful collaboration. The absence of a communication plan, particularly in the crucial early stages of this initiative, was a key barrier to knowledge and uptake of these tools.
- Both a "carrot" and a "stick" have a role in the uptake of evidence-based practices. Use of the tools was not included in service provider contracts until 2004 and, when they were, uptake increased.
- Communities of practice appear to be valuable in supporting the use and clinical application of evidence-based practices. Pilot testing suggests time is needed to build a sense of trust among community members to allow for the exchange of tacit knowledge and to contribute to the development of a culture around new practices.
- To be most effective, even in a mandated context, KT strategies must be developed in accordance with the individual and organizational state of readiness for change. Our approach has been to support all organizations and practitioners, but to focus on those who have a higher level of readiness for the adoption of new tools, which increases their chance of success. We highlight the successes of these "early adopter" organizations in the community-of-practice venues and on the website so that "late adopters" can share in their experiences.

> *Both a "carrot" and a "stick" have a role in the uptake of evidence-based practices.*

- The importance of face-to-face support cannot be overstated. Although more costly, it is the mode of KT most valued by and beneficial to practitioners. It is, in our view, most successful for sharing both the tacit and explicit knowledge required to build a professional learning culture.

The importance of face-to-face support cannot be overstated.

Conclusions and implications

Our work continues to introduce the BCFPI and CAFAS tools to a significant proportion of Ontario's children's mental health care providers. We have implemented a targeted KT infrastructure that supports significant practice change, and allows us to use our limited financial and human resources for training more effectively, as well as for supporting a culture of practice change.

We hope to continue to learn how best to bring evidence-based practices to the field and how to support the adoption of new and innovative approaches to mental health care for children. Anecdotal reports suggest appreciation for the tools' clinical contribution is growing with practitioner experience. However, real and perceived barriers remain to be addressed, including the time required to use the tools, the importance of assessing response to treatment and the extent to which the data generated are viewed as purely bureaucratic, as opposed to meaningful for clients and service provider organizations. Whether we are successful in developing a culture receptive to evidence-based practice and service delivery innovations in children's mental health remains to be seen: the journey continues.

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A COLLABORATIVE MODEL OF KNOWLEDGE TRANSLATION FOR SUSTAINABLE PRACTICE CHANGE

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As part of a long-term research program on hospitalization and help-seeking experiences of diverse ethnocultural groups, a collaborative model of knowledge translation (KT) was developed between researchers and decision makers at a regional health authority in British Columbia. The model was based on a respectful relationship between researchers and clinical leaders, with the sharing of emerging findings in real time to inform sustainable practice changes. In addition to improvements in the practice setting, the partnership has resulted in constructive changes to the clinical research process, in recognition of the integral role practitioners and decision makers play.

Background

The collaborative model of KT[1] presented in this case study illustrates how established partnerships between researchers and leaders in the clinical environment can facilitate the uptake of research in health care settings. Developed over the past two years between researchers and health care decision makers at one of British Columbia's regional health authorities, Vancouver Coastal Health, our KT activities were part of a six-year, CIHR-funded program of research on hospitalization and help-seeking experiences of diverse ethnocultural groups.

Our approach to KT was driven by requests from clinical leaders for timely access to research findings that could inform ethically-sound decision making. Our KT model drew on both CIHR's[2] and Lavis et al.'s[3] frameworks, which encourage the development of take-home messages as a starting point for interactive dialogue with clinical leaders, and to use people seen as credible to clinical leaders to initiate that dialogue.

Our goal was to effect a cultural shift that would facilitate the ongoing use of research knowledge that underscores how socioeconomic, historical, and contextual factors intersect to influence patients' hospitalization and transition to home experiences. We aimed to produce sustainable transformations in practice at Vancouver Coastal Health towards more equitable, efficient and effective health services.

The KT initiative

The main components of our KT model were the development of a context that supports KT, the synthesis and use of research-based take-home messages as a point of engagement with clinical leaders and the collaborative development of specific initiatives to address research findings.

The model is underpinned by a relationship between researchers and clinical leaders grounded in accountability, reciprocity and respect for each other's knowledge. Clinical leaders act as advocates for research in the practice setting, while researchers actively participate in translating the research. Clinical partners provide input from their practices into research questions, research data are collected and analyzed concurrently and emerging findings are shared between research and clinical partners in "real time."

Various strategies were used to bring researchers and clinical leaders together in open and creative dialogue. These included holding meetings at times and locations that were conducive to the work schedules of clinical leaders; inviting leaders from across the continuum of care to talk with researchers; ensuring the gap between researchers and clinical leaders was bridged through team members with extensive experience in both academic and clinical settings; and listening carefully to and acting on issues of interest to clinical leaders. Our most effective dialogue occurred during informal breakfast meetings where we discussed emerging findings. These meetings were pivotal, as specific initiatives designed to address the research findings grew out of the collaborative discussions that took place.

Results of the KT experience

We developed initiatives that target sustainable changes in practice at both the systems level and the individual practitioner level. We have initiated a number of projects at the systems level,[4] including two medical interpreter programs and a quality improvement project that uses follow-up telephone calls to discharged patients to provide continuity of care between the hospital and home. At the individual practitioner level, the team has received CIHR funding for a three-year study of cultural safety and knowledge uptake in clinical settings. This project will use "just-in-time" teaching[5,6] as a strategy to translate findings into practice.

In addition to changes in the practice setting, our KT experience has also led to changes in the research process. It has demonstrated the integral role of clinical practitioners and decision makers in clinical research, in particular, how their input ensures that the results of research are relevant to the current context of health care.

For example, early in the project we were surprised to find that several patients were readmitted to hospital. A number of issues were affecting patients' experiences during the transition between hospital and home, such as the timing and quality of discharge teaching, and communication when the patient couldn't speak English. It struck us that many of these readmissions might have been preventable, as illustrated by this recounting of discharge teaching by a female Anglo-Canadian patient who was readmitted for constipation:

> *R: "So the information that the dietician gave you at the hospital was…?"*
> *P: "Overwhelming…I broke into tears. Well, the stuff she told me was right; there was nothing wrong with that. It's just that you need to know where to start, when you go home."*

Clinical leaders were extremely interested in this finding because they had been unaware of the high rates of hospital readmissions—patients were not necessarily readmitted to the original hospital where they had received care, and readmission rates were not tracked across health authorities. They pushed us to provide more concrete numerical data and to examine further why this was happening. The readmission data provided a strong point of focus for collaboration and resulted in the development of systems-level KT initiatives to target the issues contributing to unplanned readmissions.

Lessons learned

One important lesson of this process is that a long-term commitment from researchers and clinical leaders is needed to effect sustainable transformations in health services. While members of our larger group have changed, particularly the clinical leaders, core team members have been working together since 1998. This ongoing relationship of trust and collaboration has proven important for the development of some of our innovative initiatives.

Researchers and clinical leaders often speak different disciplinary languages and are affected by different and sometimes competing pressures.

There have been challenges around the development and use of this approach to KT. Researchers and clinical leaders have had to shift away from their traditional roles to embrace a collaborative, dynamic and reciprocal process. Negotiating roles and responsibilities can be complicated, especially in the demanding environment of the health care system. Because the KT process requires ongoing face-to-face dialogue, protected time for clinical leaders to participate is essential. An organizational climate in the practice setting that supports KT is, therefore, crucial.

An additional challenge has been bridging the understanding gap between researchers and clinical leaders. Researchers and clinical leaders often speak different disciplinary languages and are affected by different and sometimes competing pressures. Key to bridging this gap has been the use of "credible messengers" who are well versed in both the clinical and academic worlds. Our team includes two doctoral students with strong links to practice, who are funded from both the research and practice settings.

We found that our model was especially relevant for KT with qualitative research and critical perspectives: data collection and analysis can occur concurrently, and can be flexible and responsive to priorities identified by clinical partners. Findings from such research often reveal complicated structures and social processes. Yet, researchers must be attuned to the kinds of findings that clinical leaders need to support decision making and be willing to negotiate the research agenda.

For instance, when presenting the readmission data discussed earlier, researchers were also asked to provide numerical data that could be translated into costs to the health care system. At times, requests for such "bottom-line" information conflicted with the more theoretical, contextual, and broad-based analyses that the researchers employed. The shorter time frames for taking the findings back to practice also presented a challenge for researchers used to more time for analysis. For the most part, our challenges have been successfully mediated because of our carefully cultivated collaborative relationship and the commitment of all team members to a common goal.

Collaborative partnership where clinical leaders have direct and real input into the research process, should be a cornerstone of research in the health care setting.

Conclusions and implications

Over the past three years, we have integrated the KT model into presentations of emerging findings at national conferences, public lectures, and meetings with researchers, clinical leaders and policy makers. There is widespread interest in the model's applicability in a variety of health care settings that require creative and innovative solutions to complex issues. We are careful to stress the level of commitment and resources (mostly time) needed from all participants to make the KT model work effectively, yet also celebrate the potential impact of this approach on practice within the health care arena.

Our experience, along with that of other knowledge translators, suggests that collaborative partnerships such as the one we have fostered, where clinical leaders have direct and real input into the research process, should be a cornerstone of research in the health care setting. These partnerships enable the data collection and analysis process to be responsive to the changing needs of the clinical setting, resulting in findings of immediate importance. Clinical leaders are also eager to take up the findings because of their personal investment in the research process. Effective dialogue can result in creative solutions to complex problems.

Although the funded component of this research project has now drawn to a close, our KT experience continues. We recently received three years of funding to extend and refine our model to enable KT from this program of research, as well as other research projects that similarly aim to highlight disparities in health care delivery, with front-line practitioners.

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DEVELOPING A MODEL FOR THE SHARED CARE OF CHRONIC DISEASE

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Researchers from the University of Calgary partnered with the Calgary Health Region and health care providers in a three-year demonstration project to trial three different models of multidisciplinary team care for chronic diseases. Focusing on common chronic diseases, each model was evaluated by appropriate lab indices, self-care behaviours, and patient and provider satisfaction surveys. While all models demonstrated positive results, ongoing input from providers and patients resulted in the development of a hybrid model for implementation in all family physician offices across Calgary Health Region.

Background

Considerable evidence in the research literature demonstrates that multidisciplinary health care provider teams result in better treatment of chronic disease. Since 1998, Calgary Health Region, in partnership with its physicians and the Government of Alberta, has supported the development of primary care teams for managing chronic disease through various funding initiatives, including the Health Transition Fund (HTF).

An early HTF funded-project involving Dr. June Bergman and Dr. Alun Edwards focused on multidisciplinary team building, partnering with the Calgary Health Region through their public health and home care portfolios. This two-year project involved six family physicians in their practices being partnered with home care nurses and public health nurses for the ongoing care of selected chronic diseases, and allowed barriers of union regulation and the development of shared practices to be worked through.

In 2000, the Calgary Health Region initiated a physician partnership program to support innovative ideas. This program funded over 30 business cases, one of which was based in part on the successful HTF project, and in part on a literature review and site visits of several multidisciplinary teams. This case, involving researchers from the University of Calgary, was funded as a demonstration project by Alberta's Health Innovation Fund and Alberta Province-Wide Services. Formal partnerships with the region's home care services, diabetes clinic, hypertension clinic, specialist and generalist physicians, and others were struck, with an intention to create a sustainable infrastructure if the project evolved favourably.

The KT initiative

Our goals for this demonstration project were: to demonstrate the value of multidisciplinary teamwork in the care of people with chronic disease; the impact of the team on quality of work life for the team members; and the impact of the model on the individual patient's chronic disease. In partnership with the health care professionals likely to be involved in the program, we operationalized the business plan developed earlier, choosing three different models of multidisciplinary team care that seemed to fit the local environment. Each model was funded for a period of three years.

Model One (case management) was built on a partnership between a physician and a home care nurse who initially partnered on the basis of overlapping practice, and then on a shared workload of chronic disease patients. In Model Two (focused case management), identified patients were assigned to a nurse/dietitian team over the period of the project. In Model Three (accessible expert), identified patients would be seen by an expert team from the diabetes education centre (usually a nurse and dietitian) on a one-off basis. Model Three also had specialist physician expertise available.

Each model was allocated to a group of approximately 20 primary care providers. Three common chronic diseases—diabetes, dyslipidemia, and hypertension—were chosen for use in the models because they were well studied in the literature, and allowed us to use intermediate indicators (such as hemoglobin A1C level in diabetic patients) as a proxy for outcomes.

Teams were directed to use clinical practice guidelines for the chosen chronic diseases. These guidelines were locally adapted by the generalist and specialist physicians initially, and later by the broader team. From the guidelines, a clinical care pathway was developed by the full team, the various roles of the team members were defined, and algorithms of care were developed for all the disease entities.

The models were evaluated by measuring appropriate lab indices, self-care, wellness scales, and patient satisfaction surveys, at baseline, one year, and two year time points. The team members were also interviewed in a structured manner for their perspectives on working in the team, particularly to identify strengths and weaknesses.

Results of the KT experience

All models demonstrated positive results in most laboratory indices. Self-care behaviours such as exercising, managing diet, and glucose testing, showed improvement in all models at the one-year mark, but not all behaviours were sustained throughout the two years. Wellness survey outcomes for the patients did not demonstrate any statistically significant improvement. There was a demonstrated loss of wellness perception that was assumed to arise from either education resulting in a better appreciation of the disease, and/or the natural downward course of the disease.

As a result of the evaluation, and from ongoing input from providers and patients, we were able to demonstrate which of the models would best fit in the Calgary Health Region. The proposed model, which is based on Model One (case management), with support from Model Three (accessible expert), is now the region's chosen model for chronic disease management, and is being implemented in all family physician offices across the Calgary Health Region.

The proposed model is now the region's chosen model for chronic disease management, and is being implemented in all family physician offices across the Calgary Health Region.

Lessons learned

Partnerships at all working levels were an essential part of this project: within the care teams, within the research group, and between the various policy making bodies that impacted on our initial ability to do the project, and when it was successful, to roll out the results as a sustainable model for managing chronic disease in the Calgary Health Region.

Because so many of the ideas were new, much time was spent ensuring everyone understood the project goals. Initially, the two funding agencies, with their differing goals and objectives, were brought together to approve the project. Some reporting deadlines and deliverables had to be adapted. There was a request for evaluation of the team, another for the project to have a rural component, and another for a strong outcome consideration. However, the evaluation of all models was richer as a result of the partnership.

Flexibility was also important. Nothing could be left unquestioned, whether it was roles, clinical decisions, or policies. Over the three years of the project, participants were actively engaged in molding the models. This produced a very functional model, but was sometimes seen as a lack of strong leadership because of the rapid change in focus for the models.

Engagement of both the project leaders and participants in many levels of policy making were crucial to the success of the project.

Engagement of both the project leaders and participants in many levels of policy making were also crucial to the success of the project. Some held positions within the Calgary Health Region that allowed them to influence policy and budgetary decisions within their portfolios. Others worked within the health professional groups to develop policies and direction to support continued operation of multidisciplinary teams. In Alberta, this activity has resulted in many ongoing alternative fee plans, a new fee for physicians participating in some teamwork (to speak to home care nurses about patient care), the development of new local primary care networks of physicians and the development of the *Health Professions Act.*

At the health care provider level, a number of important factors for success for working in team-based models were identified. These included:

- Initial co-location of members
- Active engagement of all team members
- Open communication
- Shifting leadership roles, depending on expertise
- Trust and respect between team members
- Shared goals and readiness for change
- Confidence in team competence
- Evolution of roles and functions
- Promotion of the team

Discussions with the team members also determined that success in teamwork was enhanced if members possessed professional assertiveness, strong clinical skills, communication skills, knowledge of the community and home care systems, the ability to contribute in case conferences, IT skills, and experience working in teams.

Physicians reported that their interest in participating in multidisciplinary teams was enhanced by prior involvement in similar projects, positive patient outcomes, reduced workload, and the opportunity to participate in system change. They noted a number of barriers to working within such models, however, including reimbursement, space, and difficulty in maintaining strong leadership and direction.

Conclusions and implications

Our project was based on a rapid-cycle model of change, which raised many new questions and sparked additional projects. Chronic disease management within the Calgary Health Region has now expanded from the original three areas of diabetes, hypertension and dyslipidemia to include chronic obstructive pulmonary disease and congestive heart failure. Each of these conditions will be included in our blended chronic disease management model now being implemented across the region. Calgary Health Region also has a new chronic disease information management system, and is making early steps to support the province's electronic health record.

A team has also been working with patients to identify the need for community resources in education, diet, and exercise for those with chronic diseases. This has resulted in a program in Calgary that provides safe places for people with chronic disease to exercise, and is itself a partnership between the Calgary Health Region and designated fitness and community facilities. People can be referred from the chronic disease program or can self-refer, but in the spirit of the new partnership model, all people going through the program are required to obtain their family physician's approval prior to participating in the exercise program.

The case management model (Model One) is now being piloted in Ontario to determine if the principles of multidisciplinary teamwork as outlined in Calgary are transferable across jurisdictions. This national partnership project also has a significant information technology component, and is attempting to bring IT to the team in a manner that enhances the work they do.

SEARCH CANADA: BUILDING CAPACITY IN HEALTH ORGANIZATIONS TO CREATE AND USE KNOWLEDGE

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(On behalf of the entire SEARCH Canada integrated faculty, staff, participants, and network).

Alberta's SEARCH Canada is dedicated to implementing a system-wide approach to knowledge translation (KT) and use. With a 24-month program to train community-based health professionals in applied health research, SEARCH develops individual and organizational capacity for the ongoing use and development of research evidence in decision making. Specific attention is paid to skill development in using information tools and technology, participating in collaborative networks, and sustaining ongoing personal development as a scholar-practitioner. SEARCH and its participants are now widely known in the Alberta health system, and the program has attracted both national and international acclaim.

Background

SEARCH (Swift Efficient Application of Research in Community Health) Canada[*] is an Alberta-based public service organization dedicated to knowledge access, creation, and use by health managers, health providers, and their organizations.

SEARCH was launched by the Alberta Heritage Foundation for Medical Research (AHFMR) in 1996 as a twenty-four-month program to train community-based health professionals in the "how-to's" of applied health research, including accessing and assessing high quality information, and applying it in decision making. In April 2005, SEARCH Canada began operating independently, governed and funded by member organizations, which include AHFMR, Alberta's nine health regions, and the University of Calgary. Support is also provided from Alberta Health and Wellness.

SEARCH develops capacities for, and communities of, practice-based learning and innovation, in practice and research sectors across the province. SEARCH supports a network of health professionals and researchers, and their respective organizations, all of which are dedicated to the creation of new knowledge and its translation into better quality health care decisions.[1]

The SEARCH story is about the experience of implementing a system-wide approach to KT and use. Through SEARCH, we are learning that evidence-based decision making across a health care system requires more than skills and information. It depends on people's attitudes, values, and their daily interactions; it is as much a matter of relationships as of information and is dependent on a culture of openness, exchange, respect, and confidence.

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[*] For more information about the SEARCH program, please visit http://www.ahfmr.ab.ca/search.php.

The KT initiative

The overall framework for learning and KT and exchange in SEARCH's activities links three overlapping areas of focus—choosing evidence, creating evidence, and using evidence—while always being mindful of the complex context in which it is to be used. SEARCH's philosophy embraces partnership and recognizes both service and academic organizations as part of the health system.

SEARCH's core activity is a cohort-based learning program that emphasizes the value of applied health research, KT and exchange of knowledge across diverse sectors. A combination of residential sessions, practice-based research projects and sophisticated web-based learning supports[2] target long-term, sustainable capacity building of individuals and their organizations. Capacity in the academic sector is built through the core faculty team and additional experts, who are drawn from university faculties of medicine, nursing, and business, and the public and private sectors. Faculty are continuously involved in program design and delivery and develop enduring relationships with participants.

Participants are established health professionals from many health care areas, including nursing, social work, health promotion, mental health, family medicine, and health administration. They are selected by Alberta's health authorities and range from front line clinicians to senior managers. Participants continue in their employment and their salaries remain guaranteed by their sponsoring organizations. Approximately half of their time is allocated to learning and research-related activities.

SEARCH participants have ongoing access to a network of faculty and past participants through a web-based communications system designed to facilitate knowledge sharing. Learning is promoted as a lifelong endeavour, and support for using evidence to improve the quality of health care decisions continues well beyond the 24 - month program. The foundations for ongoing use of research evidence in decision making are developed by paying specific attention to skill development in using information tools and technologies, participating in collaborative networks and personal development as a change agent and scholar-practitioner.

Direct managers of SEARCH participants are involved in prioritizing provincial project topics, definition of local projects, and periodic meetings to discuss issues such as participant support and translation of individual to organizational capacity. Participating organizations are also connected to research development advisors based at colleges and universities across Alberta, for just-in-time advice and assistance.

Results of the KT experience

SEARCH program processes and outcomes are evaluated during and after each instructional module and at 12, 18, and 24 months using surveys and focus groups. To date, more than 125 health practitioners and 60 faculty members have participated in SEARCH's program. Seventy per cent of participants continue to be active in research after four years.

Over 100 practice-based research projects have addressed a variety of pressing issues in health services, health human resources, professional practice, health care management, and population health. These include program evaluations of community health programs, change management capacity assessments, analysis of the impact of the on-call burden on rural physicians and the value of telepsychiatry.

There are a number of levels—service delivery, academic, funding—and loci of change—individual, individual in an organization, health care organization, health care system, and trans-sectoral system—through which SEARCH activities can have an impact. Impacts of SEARCH for the individual, as perceived by managers and participants,[3] include increased:

- Skills in research and research application. One small region has identified over $750,000 in grants attributable to the capacity introduced by SEARCH participants. Another region has identified over $500,000 in successful grant applications.
- Career development and responsibility for activities linked to evidence-based practice.
- Personal and professional networks.
- Leadership capacity and the ability to influence decision making.
- Job satisfaction, recognition, and respect.
- Research and evaluation activities.
- Publication and dissemination of research results.

One small region has identified over $750,000 in grants attributable to the capacity introduced by SEARCH participants.

Organizational level impacts reported by managers[4,5] include positive changes in:

- Access to information resources and the ability to identify relevant information when needed.
- Skills and knowledge among staff.
- Leadership development.
- Capacity for individual and organizational collaboration. Some regions and organizations have become active in province-wide and national initiatives due to expertise developed through SEARCH projects.
- Health research and evaluation activities.
- Supportive attitudes to research and evaluation.
- Culture shift. Many organizations identify SEARCH participants as catalysts for change towards a more evaluative culture.

Lessons learned

SEARCH's approach is not a quick fix. Rather, sustained learning opportunities, ongoing connection to knowledge sources, linkages across research and practice expertise, together with executive buy-in, are critical to successful engagement in the exchange and use of evidence to make a lasting difference. Some of the key learnings throughout the early years of SEARCH include:

- Health professionals are determined to improve practice and health outcomes through research, without academic credit as an incentive.
- Managers are key to ensuring participants are supported in the program and are often the advocates for evidence-based decisions within an organization.
- Senior executive engagement is critical for organizational-level impact and diffusion.
- Experience of priority-setting and collaboration among decision makers and researchers fundamentally enhances evidence use and creation.

Sustained learning opportunities, ongoing connection to knowledge sources, linkages across research and practice expertise, together with executive buy-in, are critical to successful engagement in the exchange and use of evidence.

- Learning and skill application takes time and needs to be seen as an investment.
- The development of a flexible and distributed faculty with organizational support is crucial—commitment to practice-based learning and enjoyment in relationship-building are key.
- Projects reflecting local and provincial planning priorities provide a powerful learning mode for individuals and an obvious benefit for organizations.
- Viewing the participating organization (whether academic or service sector) as the client, rather than the individual health professional, transforms the potential for capacity development.

Projects reflecting local and provincial planning priorities provide a powerful learning mode for individuals and an obvious benefit for organizations.

We have also identified a number of characteristics of the SEARCH program that we believe have been crucial to its success:

- The creation of a strong, supportive network of people across the province.
- Exposure to and relationship-building with people from diverse settings and backgrounds.
- The opportunity to learn intensively, with a broad perspective.
- The opportunity to disengage from everyday work environments to focus on skill development and learning.
- State-of-the-art communication and computerized networking to support collaboration and ongoing communication.
- The emphasis on community-based issues, a population health perspective, and applied health services decisions.
- The requirement to identify and complete projects relevant to the organizational setting.

Conclusions and implications

The result is a health system that is "research-savvy", more likely to generate research questions from practice, more able to collaborate in research projects and more willing to use new knowledge to change policy and practice.

SEARCH has demonstrated the value of an integrated solution that builds bridges between research and practice, develops health organizations' research capabilities, invests in new expertise for mid-career professionals across all disciplines and supports academics with a passion for working with the service delivery system. The result is a health system that is "research-savvy", more likely to generate research questions from practice, more able to collaborate in research projects and more willing to use new knowledge to change policy and practice.

The program and its participants are now widely known in the Alberta health system. SEARCH has also attracted national and international attention, with jurisdictions in other Canadian provinces, the United Kingdom, Australia, and Uganda expressing interest in piloting SEARCH programs.

In conclusion, there is no better evidence that SEARCH is making a difference than hearing from participants themselves. Years after their participation in a SEARCH cohort, they continue to remain involved and to extend their learning in practice. We let one of the first "SEARCHers" have the last word:

> *"The concept of SEARCH has always been one of developing research capacity at the grass roots level, something that was never going to be accomplished overnight. But less than 10 years after it got off the ground, the program is reaching across the country; a fantastic accomplishment that reflects the efforts of…everyone who has dedicated their time to the vision of the program."*

—Dan Richen, SEARCH I Participant
Manager, Environmental Public Health
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RESPONDING FROM WITHIN: WOMEN AND SELF-HARM

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Self-harm—any behaviour that a woman commits to intentionally cause herself harm—is a serious health issue, especially among criminalized women. In 2001, the Elizabeth Fry Society of Manitoba (EFS) convened an inclusive research team of community women, academics, and EFS staff to better understand and act on self-harm. The initiative resulted in a holistic appreciation of the issue and sparked a series of partnered research initiatives with multi-sector involvement. Working in a team founded on diversity and committed to shared decision making was challenging but ultimately positive, and has led to ongoing research and knowledge translation (KT) activities.

Background

The Elizabeth Fry Society of Manitoba (EFS) is a non-profit, community-based organization that actively seeks to reduce the number of women and girls involved in the criminal justice system. In past years, the EFS experienced an increase in self-harm among its adult female clientele in trouble with the law.

In 2001, the EFS convened an inclusive research team to gain an increased understanding of self-harm and to translate that understanding into action. This team, which included incarcerated and community women who had self-harmed, academics, and EFS staff, reflects an approach to KT that capitalizes on the strengths contributed by all partners and actively shares decision-making power. This approach highlights the importance of both process (e.g. effective communication among partners) and product (e.g. research findings that benefit users).

Funded by the Prairie Women's Health Centre of Excellence, the initial stage of our research focused on the experiences of women in trouble with the law, their needs and the responses of community health, social justice agencies, and correctional institutions. It resulted in a holistic definition of self-harm: any behaviour—physical, social, emotional, or spiritual—that a woman commits to intentionally cause herself harm. It is also recognized as a way of coping and surviving emotional pain and distress rooted in traumatic childhood and adult experiences of abuse and violence. We concluded that community and institutional responses to women's self-harm were often detrimental and that there was a need for policy development on self-harm as a serious health issue.

In 2003, these findings led to the second phase of our project, funded by the National Crime Prevention Strategy (NCPS), which focused on knowledge translation activities through the development of a Community Intersectoral Committee on women's self-harm. In 2004, the third project phase, again funded by the NCPS, we developed an environmental scan. The results are due to be released at a Manitoba community roundtable, with the expected outcome being a compilation of guidelines for developing policy and programming on self harm.

Awareness raising is a prerequisite to policy and program development.

The KT initiative

We recognized early in the project that awareness raising is a prerequisite to policy and program development. Our initial KT goal was therefore to increase awareness of women's self-harm through promotion of our research findings to the criminal justice, public health, social service and government sectors. Our activities included a media release event to launch our initial report, wide distribution of a plain language summary of our research, and presentations and publications in national and international academic forums and community venues.

To take our awareness raising to the next level, in partnership with the community, we then established a Community Intersectoral Committee, with representation from all our intended KT audiences: criminal justice and public health policy analysts, government decision makers, academics, front line workers, and clients. We were then able to better design our KT activities for each target audience:

- *Government decision makers:* We made presentations to the offices of the ministers of Justice and Health in Ottawa, the provincial Department of Justice, and the Canadian Human Rights Commission on federally sentenced women.
- *Policy analysts:* We held meetings with prison representatives from provincial correctional facilities and federal corrections.
- *Academia:* We presented conference papers at several university association meetings, were guest lecturers on university campuses and published articles and research reports in academic journals, newsletters, and in a correctional encyclopaedia.
- *Front line workers:* We held community workshops, extensively distributed a plain language summary of the research report, and collaborated with the Crossing Communities Art Project, a Manitoba organization that develops arts programs as a healing approach for women who self-harm.
- *Clients:* We developed plain language summaries that offered short-term strategies designed to help women and their loved ones deal with self-harm.

These activities (the products) and the diligent work of our team members (the process) guided our development of the environmental scan in the project's third phase. In this phase, our KT strategy moved beyond awareness-raising to examining the perspectives of service providers in justice, health, and social services on existing resources and the effectiveness of current programming and services.

Results of the KT experience

Our KT activities led to several instances of uptake of our research findings by those outside our original collaboration and intended audiences. For example, a number of health providers who did not routinely deal with criminalized women wanted to participate on our Community Intersectoral Committee. This reinforced the importance of our research on self-harm as a health issue not only for women who were at risk, but also for women in the general community.

A second example is policy action on self-harm by the Youth Solvent Addiction Committee (YSAC). YSAC's mission is to create a healthy recovery network of solvent treatment centres for First Nations and Inuit young people, their families, and communities. YSAC adopted a self-harm policy for its treatment centres based on an understanding of self-harm developed through our research. A similar policy statement was also formulated by the Canadian Association of Elizabeth Fry Societies, which passed a national resolution on self-harm after the publication of our research report.

Lessons learned

Our research team learned many lessons from our KT activities, which shaped the directions of later phases of the project. The lessons were both positive and at times difficult.

Managing potential tensions

Some organizational representatives of the team could understandably be viewed with suspicion by some of our intended audiences.

There was recognition that some organizational representatives of the team, such as the EFS, who had been instrumental in launching a human rights complaint against the Portage Correctional Jail, could understandably be viewed with suspicion by some of our intended audiences (e.g. Manitoba Justice). As a result, we set out to address potential misunderstandings by identifying and matching presenters with various groups, or by shifting the emphasis of what we presented to different groups. The success of this approach was evident when key decision makers and policy makers from the justice system and general health care sector participated on our Community Intersectoral Committee alongside EFS staff and clientele.

Opposing views

For the most part, the team members' breadth of experiences broadened our approach. But working on a team founded on diversity and committed to the principle of equality in decision making required considerable give and take. One example of group dissension occurred over the design of the research report cover. Some members wanted to feature a picture of a restraint chair to bring attention to the inhumane treatment of incarcerated women who self-harm. Others were concerned about an adverse reaction from justice and correctional officials, which might impede our efforts to work with them in bringing about policy change. There was also disquiet over sensationalizing and exploiting the women's pain. Lengthy discussions followed on the role of research as an advocacy tool. Eventually we agreed that the report cover would feature a symbolic grey background with red lettering, and that the image of the restraint chair would be used in a separate postcard campaign by one partner—the EFS—on the plight of Manitoba women in provincial custody.

Evaluation

We did not initially set up an adequate evaluative component of the effectiveness of our KT techniques and their impact. In response to the needs of our funders (who want hard evidence that our efforts are making a difference), we collected quantitative information on the number of reports distributed, the number of media interviews held, papers published, etc. But we did not establish a framework to gain a qualitative understanding of the effectiveness of our KT efforts (i.e. did we succeed in raising awareness?). Drawing on this lesson, we are now in a position to set criteria of KT success to evaluate our efforts for the remainder of the project.

Unanticipated happenings

The overarching lesson of this project is that working with a diversity of partners, and attempting to translate findings into awareness and action with an even broader representation of community partners, brings with it a great deal of uncertainty. The human elements—members leaving jobs, changing governmental priorities, or even clients passing away—could not be planned for, and we learned that the most effective

Working with a diversity of partners, and attempting to translate findings into awareness and action with an even broader representation of community partners, brings with it a great deal of uncertainty.

response was to be flexible and open to creative and collaborative solutions. In the end, these lived experiences provided considerable wisdom to the team.

Conclusions and implications

Our team is now entering a new stage of its multi-phased project on self-harm, which will involve an expansion of the research team and development of a community advisory group. This phase, which will examine Aboriginal women's drug use as a form of self-harm, will involve hosting a community roundtable to discuss the findings of our environmental scan and to action plan next steps. Steps will also be taken to map out an evaluative framework for our KT strategy.

These and related activities will remain consistent with our original KT foundation, capitalizing on the strengths and diversity of our team members and sharing decision-making powers. This is of critical importance to process as well as product, both of which are essential elements of our approach to KT.

A COMMUNITY-RESEARCHER ALLIANCE TO IMPROVE CHRONIC WOUND CARE

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A partnership between health services researchers from Queen's University and the University of Ottawa, a community nursing agency and a home care authority in Ottawa led to major improvements in the quality of care for people with leg ulcers. The synthesis of both external and local evidence played a key role in the adoption of an evidence-based protocol and provided the critical context to support a significant reorganization of the existing service delivery model. This case demonstrates that, with a collaborative-partnership approach, systematic and transparent research processes can be rapidly developed to support policy change.

Background

Leg ulcers are a chronic, debilitating, costly and neglected condition. In 1999, the annual regional expenditures for 192 individuals living in the Ottawa area and receiving home care for their leg ulcers was $1.3 million. This group of individuals accounted for only 6% of all home care clients, but consumed 20% of the total supply budget. Yet there is strong evidence from numerous randomized controlled trials that a thorough initial assessment and application of compression bandages is a very effective treatment for healing venous leg ulcers.[1]

Ottawa Community Care Access Centre (OCCAC), the home care authority in a region of approximately 750,000 people, became concerned about the growing demand for community care of wounds, burgeoning wound-care supply budgets, and a shortage of nurses. In 1999, the OCCAC partnered with a not-for-profit community nursing agency—the Ottawa Victorian Order of Nurses—and a team of health services researchers from Queen's University and the University of Ottawa to address their mutual concerns about care of individuals with leg ulcers. The objective of the partnership was to improve both the quality of care and health outcomes for individuals with leg ulcers.

This project involved both the community and tertiary sectors and was financially supported by the OCCAC, the Ontario Ministry of Health and Long-Term Care through career scientist research allowances, and CIHR through a grant to evaluate the effectiveness of home versus clinic care for leg ulcers.

The KT initiative

The partnership was formed with a common vision of developing a pragmatic, evidence-based approach to bringing about practice and service changes. We approached the research as a collaborative and participatory endeavour. The partnership has gone through a number of phases, each with a varying degree of knowledge translation (KT) activity. Sometimes occurring simultaneously and often impacting each other, the phases of the partnership included:

- The identification of the delivery of leg ulcer care as an important organizational issue by OCCAC, community nursing agency managers, and policy makers;
- Researchers reviewing the literature on the effectiveness of leg ulcer care and service delivery models and identifying best practices;

- Conducting a regional prevalence and profiling study, environmental scan and practice audit with OCCAC and the nursing agency to determine the magnitude of the problem and current practice;[2-4]
- Conducting surveys of care providers to determine provider concerns and issues;[5,6]
- Engaging OCCAC's board with evidence from both the literature and locally derived data to support their decision making;
- Forming an interdisciplinary group of providers and researchers which systematically reviewed the quality and utility of existing practice guideline recommendations and adapted them for local use by creating an evidence-based leg ulcer care protocol;[7,8]
- Managers, policy makers and researchers coming together to redesign the service delivery model to support best practice (a dedicated regional nurse led a leg ulcer team to provide care in home and clinic settings);
- Managers finding innovative ways to overcome organizational inertia and financial and structural barriers to make the redesign happen;
- Researchers, with the support of the agencies, creating opportunities for nurses to advance their wound care knowledge and skills through an exchange program in the UK;
- Conducting a pre-post study of the impact of the implementation of the evidence-based protocol;[9]
- Using the opportunity of preparing a grant proposal to seek peer-reviewed research funding to coalesce researcher-policy maker synergies;
- Securing research funding to conduct a randomized controlled trial of the effectiveness of the service model redesign.

Results of the KT experience

Qualitative feedback indicated the partnership process had positive effects for all involved. A review of clients' health records also indicated that the quality of care improved.[10] The results of the pre-post implementation evaluation indicated that the healing rate for leg ulcers at three months increased to 56% from 23% following introduction of the evidence-based protocol, coupled with significant reductions in nursing visits and supply costs.[9] The randomized controlled trial evaluation of the effectiveness of home versus clinic care is in the last year of follow-up and the results are currently being analyzed.

> *Arrangements have been made to ensure the leg ulcer service will continue to serve the region, even though the research study has ended.*

Perhaps most importantly, arrangements have been made to ensure the leg ulcer service will continue to serve the region, even though the research study has ended. The methodology used to evaluate and adapt existing guidelines[11] has been adopted by the nursing agency to develop protocols for other conditions. It also forms the foundation for best practice initiatives of the Canadian Strategy for Cancer Control, the Canadian Stroke Network, and the Registered Nurses Association of Ontario.[12,13]

Lessons learned

We encountered some major challenges throughout the partnership, but also learnt a number of important lessons.

Change and commitment

Policy maker/manager partners changed frequently during the six-year period, meaning that we needed to continually foster new relationships. There were also numerous reorganizations and leadership changes within the regional home care and the home nursing agencies, making it challenging to keep the initiative on track.

The end result of this partnership, however, was no less than the restructuring and reorganization of service delivery to support the provision of evidence-based care. This required a major organizational commitment from service providers as it involved altering staffing and remuneration arrangements and procuring additional provider education and training.

It was also labour intensive for the researchers. The research team was regularly and actively engaged in the day-to-day ups and downs of the service and, at times, took on an active role as implementation facilitators. The researchers who were perceived as credible and neutral often had to work between the OCCAC and the nursing agency to negotiate change. However, this direct contact helped to create the common understanding and trust needed for the partnership to succeed. While it can be frustrating to continually renegotiate and establish trust with new personnel, having access to policy makers and being able to influence decision making is ultimately very rewarding.

While it can be frustrating to continually renegotiate and establish trust with new personnel, having access to policy makers and being able to influence decision making is ultimately very rewarding.

Making research evidence work for policy makers

As researchers, we had to develop methods of synthesizing and presenting external and local evidence that were useful, user friendly, and timely for policy makers. We also had to gain consensus on the value of “quick but good” research methods to meet the needs of the policy makers for immediate answers, while respecting researchers’ concerns that the evidence be derived using rigorous methods.

The critical success factor for the adoption of the evidence-based protocol was the synthesis of external and local data.

The critical success factor for the adoption of the evidence-based protocol was the synthesis of external and local data. The external evidence from the literature provided the clinical direction for the care that “ought” to be delivered. However, the local data about current practice provided the critical contextual information to enable the delivery of effective and efficient care.

Funding

Peer-reviewed research funding can be used to leverage change with organizations that value research. However, it can also hold up things when resubmission to granting agencies is required and work cannot proceed without external funding.

Conclusions and implications

The initiative was driven by a common goal of improving care and making service delivery more efficient, using the best available evidence as the foundation. It demonstrates how policy making can become more evidence-based when researchers and policy makers adopt a collaborative-partnership approach, and how this approach can increase appreciation of each other’s worlds and perspectives, build trust, encourage learning from each other and provide new opportunities to use research to improve decision making. It can be very rewarding when a visible difference is made to a population receiving care, and when that change creates additional successes.

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The project also revealed it is possible to develop systematic, transparent and relatively quick (e.g. the guideline evaluation and adaptation cycle) research processes that can support policy making. As the results of the pre-post study validating the effectiveness of the locally-developed leg ulcer protocol have only just been released, it is premature to expect that it has been adopted elsewhere. However, the protocol was updated[8] and formed the basis of an implementation study in three other regions of Ontario. Although the data have not been thoroughly analyzed, we do know that the protocol was adopted in two regions but not the third: this was likely due to the fact that organizational changes necessary to support delivery of the protocol were not made at the third site.

Important implications of this case study for future KT research include: the need to focus on researcher-policy maker relationships and the factors that promote or hinder the development of effective relationships; methods for synthesizing external and local data for policy makers; and the role of researchers as change agents and implementation facilitators.

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PRISMA: DEVELOPING INTEGRATED SERVICES DELIVERY FOR FUNCTIONAL AUTONOMY

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The PRISMA project is a collaborative research partnership designed to develop and implement mechanisms and tools to enable integrated services delivery for frail older people. Involving researchers, policy makers, managers, and clinical practitioners, the PRISMA group has developed a model that includes coordination mechanisms at the governance, management, and clinical levels; a single-entry point for access to services; case management; individualized service plans; a unique assessment tool; and a computerized clinical chart. The PRISMA model has been successfully implemented in multiple regions and has significantly influenced the development of policy and programs for the frail elderly in Quebec.

Background

Traditional hospital-centred care is inappropriate for many chronic illnesses that require ongoing, long-term care. For these kinds of illnesses, which affect many elderly people, a different model of care, one that centres on the users' place of residence, may be more appropriate. Such a model calls for major changes in the organization and delivery of health and social services, with a primary focus on front line health and home care. Given the plethora of organizations and professionals involved, integrated services are crucial.

The PRISMA project aims to develop, implement, and evaluate mechanisms and tools to improve the continuity of care and integrate health services for frail older people in Canada. The PRISMA model of Integrated Service Delivery (ISD)[1] includes all public, private, or volunteer organizations that provide care and services to frail elders, and consists of six components: coordination mechanisms at the governance, management and clinical levels; a single-entry point for access to all services; case management; an individualized service plan; a unique assessment tool with a case-mix classification management system; and a computerized clinical chart.

The PRISMA group is led by Dr. Réjean Hébert from the Université de Sherbrooke's Research Centre on Aging and includes 15 researchers from both this centre and the Université Laval geriatric research team. These two research teams work with the directors and managers of the health and social services network from the Ministère de la Santé et des Services sociaux (MSSS), the Institut national de santé publique du Québec, five Regional Health and Social Services Boards (RRSSSs), and the Sherbrooke Geriatric University Institute (a hospital centre and long-term care facility). PRISMA represents a unique partnership of researchers, policy makers, managers and clinical practitioners, who collaborate to define research objectives, design and carry out protocols and introduce results back into the field through innovative services and programs.

The KT initiative

The PRISMA group develops, implements, and evaluates ISD mechanisms and tools primarily by studying frail older people experiencing loss of autonomy. In the late 1990s, an initial project in the Bois-Francs area of Quebec, which was led by the area's RRSSS, requested support from researchers at an early stage to evaluate the experiment and contribute to the development and piloting of project mechanisms and tools. A close collaborative relationship was created between researchers, policy makers, health managers, and clinicians, leading to the later development of the PRISMA model and its components.

The evaluation of this initial pilot project provided useful information to decision makers, managers and clinical practitioners for current and future implementations. A second initiative to implement an ISD, in the Estrie region, involved the same pattern of collaborative work in designing, implementing, and analysing the experiment, and transferring the results. Other RRSSSs became interested in some components of the model and also joined the PRISMA group.

The provincial PRISMA group includes representatives from the research team, the MSSS, and the participant RRSSSs. It meets three times a year to overview the work of the group; exchange knowledge on current issues, problems, and results; determine future projects; and plan knowledge translation (KT) activities. In each region, PRISMA teams meet more regularly to design and implement experiments, monitor and analyse the results, and discuss translation strategies. A continuous exchange process is in place to monitor change and respond to emerging needs.

> *In each region, PRISMA teams meet more regularly to design and implement experiments, monitor and analyse the results, and discuss translation strategies.*

We also conduct many activities to disseminate PRISMA's results. We have held three colloquia, reaching over 600 clinicians, managers and policy makers in Quebec, and have also visited facilities wishing to implement some of our tools. A regularly updated website provides information about PRISMA's work, and a book summarizing PRISMA's work to date was recently published in both French[2] and English.[3]

Results of the KT experience

PRISMA has developed and implemented many tools to support integrated services delivery and to facilitate a shift to new professional practices and organizational change. During the Estrie implementation, for example, case managers and clinical practitioners requested a simple screening tool to identify frail elders who might eventually enter the ISD system. The research team designed and validated the PRISMA-7 questionnaire,[4] which is now used on a telephone health line, by voluntary agencies and in clinical settings to identify older people who should be referred to case managers and more completely assessed.

During the Bois-Franc initiative, we recognized that it was vitally important to have a computerized clinical chart that facilitated communication between health care workers and organizations. This information system, the *Système d'information géronto-gériatrique* (SIGG), is a computerized version of the unique assessment tool and includes the *Système de mesure de l'autonomie fonctionnele* (SMAF) disability scale. The SIGG uses an existing secure health and social services communication network (RTSS) in Quebec and is accessible by professionals in all institutions via the Internet to share information about clients.

We have also developed a case-mix classification system based on the SMAF scale—Iso-SMAF profiles—for accountability and performance evaluation. These profiles classify patients according to functional autonomy and aim to reconcile clinical evaluations with management information. The system is designed to avoid redundant data collection and to coordinate recommended services, resource allocation, patient tracking, quality evaluations and organizational accountability. These profiles been fully implemented to improve the management of people receiving home care and institutional care in two experimental areas, and the MSSS is now contemplating generalization of the profiles to all home care and institutional services.

Economic evaluation of the implementation and functioning of the PRISMA model[5] has also proved useful to policy makers planning implementations of the model and quantifying the budget needed to support it. Additional studies about the work of case managers were also used to better define new professional roles and improve training.[6] For example, the Université de Sherbrooke developed a new graduate program for case managers with the input of the PRISMA group.

Lessons learned

Working in close relationship with policy makers, managers and clinicians ensures the relevance of the group's research and its quick implementation in the health care system. But synchronizing research with services and policy is not always an easy task. Researchers no longer have total control of the experiment, and mutual trust must be established to ensure that policy makers and managers understand the research agenda. Budget constraints have slowed the implementation of ISD in the Estrie area, and of some tools (particularly SIGG), resulting in delays in many research projects. In addition, occasionally our knowledge translation activities were almost too effective, with some areas deciding to prematurely implement PRISMA work without waiting for final results. This was also true at the policy-making level, where the Ministère de la Santé et des Services sociaux included integration and the PRISMA model in his policy for older people. This could have jeopardized our evaluation research, if the selected comparison areas had immediately implemented the PRISMA model.

Occasionally our knowledge translation activities were almost too effective, with some areas deciding to prematurely implement PRISMA work without waiting for final results.

Conclusions and implications

The PRISMA group has had a major impact on the development of health department guidelines for frail elders experiencing loss of independence.

By working closely with policy makers in Quebec, the PRISMA group has had a major impact on the development of health department guidelines for frail elders experiencing loss of independence[7] and an action plan for services to frail older people. PRISMA's work has also influenced the recent provincial reform that set up integrated structures, the Centre de santé et de services sociaux (CSSSs) (merging hospitals, community health centres and nursing homes). The clinical projects for frail older people currently under development in all ninety-five CSSSs will be greatly influenced by PRISMA's work. PRISMA members have also been invited to Ontario and British Columbia to advise regional or provincial authorities on organizing services for older people, and the group recently attended a European conference on providing integrated health and social services for older persons as an international expert.

The PRISMA group continues its research. The Bois-Francs project has demonstrated statistically significant effects on patient functional independence and the utilization of health services.[8] As a result of the Estrie study, over the next few years we will be able to document the impact of ISD on health services consumption and determine the related costs through a population-based approach. We will also study ISD impact on professional practices and on frail elders and their immediate caregivers, and develop indicators to assess quality of care within ISD. Indicators are also being developed to measure ISD impact on continuity of services, which is the ultimate objective of integration.

The PRISMA group is also adapting the model for other patient populations, notably those with physical and intellectual disabilities and mental health problems. The validity of the Iso-SMAF profiles has been verified with other patients and their application to private nursing homes is now being tested.

This project demonstrates research can influence policy to improve the Canadian health and social system. The PRISMA group may also have demonstrated the most effective way of combining research with action in order to rapidly and effectively transform research data into new ways of delivering services, and conversely, to ensure that decisions made by government officials and managers are based on solid data.

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THE CANADIAN NEONATAL NETWORK™— A NOVEL MODEL FOR KNOWLEDGE TRANSLATION

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The Canadian Neonatal Network™

The Canadian Neonatal Network™ is an award-winning research and knowledge translation (KT) initiative aimed at improving the health and quality of health care for newborn babies. Comprising researchers, clinicians, and administrators from neonatal intensive care units and universities across Canada, the Network conducts evidence-based collaborative research with an emphasis on implementation of practice and policy changes. Core activities, such as providing outcomes feedback to individual hospitals, have led to significant practice improvements. The Network has also contributed to the development of policies around the allocation of neonatal resources in British Columbia and is internationally recognized as a driver for change.

Background

The Canadian Neonatal Network™ is a multidisciplinary group of researchers, clinicians, and administrators from all 30 Canadian tertiary neonatal intensive care units (NICUs) and 16 universities across Canada. We conduct evidence-based collaborative research to improve the health and quality of health care for newborn babies, with an emphasis on KT and implementation of practice and policy changes. Our program of research has resulted in many findings that have had significant impacts on patients, organizations, and health care systems. In 2004, the Canadian Neonatal Network™ received the Knowledge Translation Award from CIHR.

The Network's specific goals are to establish a national network of multidisciplinary Canadian researchers interested in neonatal-perinatal research, establish and maintain a national neonatal-perinatal database and provide the infrastructure to facilitate collaborative research. We are also interested in studying longitudinal outcomes and variations in medical care, because NICU care is one of the largest components of child health expenditures and exhibits large variations in mortality, morbidity, and costs. Overall, we aim to develop innovative research methods that can lead to improvements in health and the quality of health care.

The Network was founded in 1995 and its membership now stands at 50 researchers, clinicians, and administrators, and 20 trainees. Funding is provided by a partnership of hospitals (for data collection) and research granting agencies (for research projects). We have also established a Neonatal-Perinatal Interdisciplinary Capacity Enhancement (NICE) Team of multidisciplinary national experts who are funded by CIHR to provide in-depth support for research conducted by the network.

The KT initiative

We use an integrated approach that combines research methodology with experienced clinical and management expertise to identify health problems, find practical solutions, and implement and evaluate them. To do this, we maintain a standardized national database of all babies admitted to Canadian NICUs. Each year, we publish an audit report that monitors outcomes, treatment practices and health trends for newborn babies, and provides feedback to individual institutions and regional health authorities. We establish research teams to address health problems identified by the audit report and by members of the network at three levels—the patient, the organization and the health care system. We are currently conducting ten peer-review funded multi-centre studies aimed at improving neonatal outcomes.

We have published over 100 articles in scientific journals and have made over 100 presentations at national and international scientific meetings. In addition, we effect KT directly through:

- *Clinical care:* At each hospital, a multidisciplinary team of health professionals led by Network members monitors data feedback, and develops and implements change strategies.
- *Practice guidelines:* We work with professional societies (e.g. Canadian Pediatric Society) to generate and evaluate practice guidelines.
- *Policy and planning:* We provide health authorities and provincial governments with policy recommendations through targeted reports.

Results of the KT experience

Highlights of some of our research and KT activities include:

1. Identifying variations in NICU outcomes, practices, and best practices across Canada
We published the first comprehensive description of outcomes and practices in Canadian NICUs,[1] and examined outcomes of important sub-populations at particularly high risk of long-term health complications, such as extremely preterm infants.[2,3] Feedback of this information through an audit report to hospitals resulted in significant action to address identified deficiencies. One hospital introduced measures that reduced the infection rate in their NICU by more than half.

We also reported significant risk-adjusted variations in mortality and morbidity among Canadian NICUs.[4] These small area variations in outcomes can be used to examine the relative effectiveness of differing practices. We found that each hospital had different strengths and weaknesses, and no hospital had uniformly superior performance. This exposed the potential flaw of copying practices from reputable hospitals, since superior performance in one area does not imply superior performance in other areas.

For one condition (intraventricular haemorrhage), we identified that variation in its incidence was attributable to differences in four key NICU practices.[5] We then developed analytic methods for identifying and quantifying the attributable risks associated with outcome variations at individual hospitals.[6] These developments open the way for significantly improving current quality improvement methods which rely on subjective observations of "best practices."

2. Development of instruments to compare NICU outcomes
In collaboration with U.S. researchers, we developed and patented a neonatal illness severity score (SNAP-II) and showed how risk adjustment can be used to make valid comparisons of NICU outcomes.[7,8] SNAP-II has become the international standard for assessing the severity of neonatal illness and comparing hospital outcomes for audit, accreditation, and quality improvement purposes. SNAP-II has also been licensed to companies for risk assessment, setting insurance premiums, and incorporation into hospital patient monitoring equipment.

We also developed the first validated instrument[9] for assessing infant transport outcomes. Using this system, one hospital in Canada identified and solved a problem affecting 40% of their transported babies, who were arriving at the destination hospital with temperatures below normal.

3. EPIC (evidence-based practice identification and change) system for quality improvement
We developed a scientific, objective method of quality improvement based on evidence in the published literature, targeted intervention of specific practices for change, and the cumulative expertise of the Network.

This evidence-based practice identification and change (EPIC) system combines quantitative analysis with qualitative methods to identify barriers to change, and uses multidisciplinary teams at each hospital to facilitate practice change. By networking hospital teams, duplication of effort is avoided, lessons learned are quickly shared, enthusiasm is maintained and KT is accomplished at the ground level.

EPIC changes the paradigm of quality improvement from a subjective exercise to an objective method that can more efficiently and effectively improve quality of care. A multi-centre CIHR-funded study is underway to evaluate the impact of EPIC on quality of care in the NICU.

4. Evaluation of clinical practice guidelines
We also use the database to evaluate practice guidelines and make recommendations for new ones. For example, we found that one routine screening guideline for preterm infants was unnecessary for babies above a certain birth weight.[10] These findings led the Canadian Paediatric Society to review its national screening guidelines, with the potential to halve the number of infants routinely screened, and save hospital costs of over $1 million annually.

We also developed a formula that enables a regional hospital to identify the most cost-effective transport system for its jurisdiction, taking into account local wage costs and transport needs.[11] Anecdotal communications indicate that hospitals in other countries have also started using our system for making transport system decisions.

5. Recommendations for policy and planning
Using the database, we have examined the adequacy and allocation of neonatal resources in B.C. and submitted a report to the B.C. government with recommendations for change.[12] We also examined and reported on the costs of neonatal and perinatal care in B.C.[13,14] These reports have since been adopted by the B.C. Ministry of Health Services and the Child Health Network for the Greater Toronto Area as a basis for assessing the adequacy of high-risk perinatal capacity and for planning regional resource allocation for the future.

National networks add value because they pool expertise from a wide variety of resources, permit coordinated initiatives that avoid duplication of effort and produce results that are easily generalizable.

Lessons learned

Networks that include researchers, clinicians, and administrators in the planning and execution of research projects, and that execute practice and policy change at the ground level, as integral objectives of the project, are effective vehicles for KT in health care. National networks add value because they pool expertise from a wide variety of resources, permit coordinated initiatives that avoid duplication of effort and produce results that are easily generalizable. Clinical and administrative health databases have important roles in health research and can significantly reduce the cost and improve the effectiveness of health research.

We often found ourselves in the no-man's land between research and quality improvement, unable to access funding from either the research granting agencies or the health care system.

A major difficulty we encountered was that our initiatives were regarded by some research peer-review committee members as quality improvement and therefore not "real research," and simultaneously regarded by some health administrators as "research." Thus, we often found ourselves in the no-man's land between research and quality improvement, unable to access funding from either the research granting agencies or the health care system.

Another major difficulty has been the lack of support for maintaining the network infrastructure or the national database, from both granting agencies and hospitals. Consequently the network infrastructure is unstable and frequently disassembled and re-assembled depending on availability of financial resources, with consequent disruption to surveillance and research. Yet the network significantly reduces the cost of individual research projects by providing common infrastructure and avoiding duplication of data collection. Funding mechanisms that bridge traditional health research and management functions, and provide stability for infrastructure support, are required.

Conclusions and implications

The Canadian Neonatal Network has been described as the archetype of the KT network in Canada. It has also received international recognition as a source of benchmarking data, a driver for change, and a powerful teambuilding force. In 2003, the American Academy of Pediatrics Neonatal-Perinatal Section of District VIII voted unanimously to join the Network. Requests for assistance or collaboration have also come from countries such as India, China, Malaysia, Mexico, and Australia, and we have now established the International Neonatal Collaboration to facilitate international research and collaboration.

Funding mechanisms that bridge traditional health research and management functions, and provide stability for infrastructure support, are required.

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ACADEMIC DETAILING IN THE ALBERTA DRUG UTILIZATION PROGRAM

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The Alberta Drug Utilization Program runs a multi-faceted educational initiative, with academic detailing as the centrepiece, to improve physician prescribing behaviour in Alberta. Noticeable improvements to clinical practice guidelines have been observed over the three years of its operation. Building and maintaining relationships—between organizations, between physicians and academic detailers, and between physician peers—has been identified as key to the success of this initiative.

Background

The Alberta Drug Utilization Program (ADUP) was established in 1998 to develop, evaluate, and facilitate the implementation of drug use management strategies that promote the health of Albertans.

Academic detailing—an educational intervention for improving professional practice—was identified as one strategy that could improve the prescription and use of drugs in Alberta. The goal of academic detailing is to optimize physician prescribing behaviour by communicating evidence-based, cost-effective and unbiased drug information to providers.

However, approaches such as multi-faceted educational interventions and academic detailing may not be as effective at influencing professional practice as once believed, due to unacknowledged factors.[1] In the pharmaceutical industry, for example, significant attention is paid to the role of inter- and intra-organizational and personal relationships in the success of knowledge translation (KT) interventions.[2,3] This has not been as well explored in the medical literature.

ADUP was charged with implementing and evaluating a multi-faceted educational initiative, with academic detailing as the centrepiece, through demonstration projects in Alberta's regional health authorities. Our key partner organizations were the Alberta Medical Association, the Alberta College of Physicians and Surgeons, the Alberta College of Pharmacists, the Pharmacists Association of Alberta, The College of Family Physicians of Canada, Alberta's regional health authorities, Alberta Health and Wellness, Alberta Blue Cross, the University of Alberta and the University of Calgary. The project was funded by Alberta Health and Wellness.

The KT initiative

The initiative began in the David Thompson Health Region in late 2001 and is now being launched in the Calgary Health Region. The central goal is to improve family medicine physicians' adherence to provincial and national clinical practice guidelines for rational medication use. Specific topics are chosen by reviewing prescription claims and physician billing data to determine potential care gaps and educational needs. Literature reviews are conducted and the opinions of specialists are obtained when data is not available for selecting topics.

A multi-faceted KT approach, including multidisciplinary continuing education, academic detailing by a pharmacist, distribution of printed education materials, opinion leader consultation and comparative prescribing feedback reports which show how consenting physicians prescribe in relation to peers in the region, is used for each topic. The complete intervention occurs over four to six months.

Medical specialists deliver the continuing education, providing their perspective on important aspects of the clinical practice guideline (e.g. key points, grey areas) and answering questions. The academic detailing occurs after the continuing education, with the detailer conducting a 30-minute visit in the physician's office to talk about the guideline. Some time after the academic detailing visit, a small group session (usually at the physician's clinic) is scheduled with an opinion leader, a specialist, and the detailer to discuss cases. Opinion leaders also provide advice to the detailers about interpreting critical evidence and help them prepare for a topic by allowing them to attend outpatient clinics.

The clinical practice guidelines are produced and validated by the provincial clinical practice guidelines program, Towards Optimal Practice (TOP), which develops new guidelines, validates national guidelines, or updates older guidelines. TOP produces one-page guideline summaries for use in academic detailer and opinion leader visits. After our visits and internal evaluations, we provide feedback from physicians on the guidelines to TOP.

The University of Alberta assists in the organization and delivery of the continuing medical education programs, coordinating promotion activities, registrations, handouts, tele-health broadcasts to rural sites, attendance certificates, and evaluations.

The David Thompson Health Region and the Calgary Health Region also promote and market the initiative. In the Calgary Health Region, it has been embedded structurally within the chronic disease management unit, and physicians participating in the chronic disease management program are also recruited for academic detailing.

We evaluated the success of the initiative through monitoring of academic detailer activities, physician satisfaction and opinion surveys and through retrospective review of prescription drug claims (to assess adherence to clinical practice guidelines).

Results of the KT experience

Overall, 250 visits were conducted by our pharmacist detailer on four broad topics by the end of 2004. Physician participation increased from 10 physicians for the first topic to over 55 for a later topic, and the regional centres (cities and towns) we covered increased from two to 15. The initiative has been accepted by local physicians (high levels of satisfaction have been reported by participants) and has been successful in improving adherence to clinical practice guidelines (10-13% improvements have been recorded in adherence to two guidelines).

We attribute our success to our ability to build relationships with increasing numbers of physicians, and to foster in-depth relationships with physicians participating in the initiative.

Lessons learned

We attribute the success of the initiative to the attention given to building and maintaining relationships at both the system and front line levels. At the system level, relationships with our key provincial partner organizations, such as the health regions, Alberta Blue Cross, the University of Alberta, and TOP, were critical for the delivery of our program. As a general operating principle, we work on the premise that our activities should focus on front line delivery of services and should not duplicate activities performed by other organizations.

At the front-line level, we attribute our success to our ability to build relationships with increasing numbers of physicians, and to foster in-depth relationships with physicians participating in the initiative. For example:

The involvement of a highly supportive local champion has made a significant difference in physician recruitment and participation.

- We recruited local physician champions to increase acceptance of the initiative by their peers. As participation in the program is voluntary, the involvement of a highly supportive local champion has made a significant difference in physician recruitment and participation. In regional centres where a local champion is present, physician participation in topics has been as high as 100%. In centres without a local champion, or if the centre is too large for a local champion to have an effect, participation is approximately 10%.
- We hired local community pharmacists as academic detailers to improve efficiency and increase physician participation. Initially, we began with one Edmonton-based academic detailer. But the David Thompson Health Region spans a very large geographic area and significant time was spent traveling. So two local community pharmacists were hired to provide detailing services. Their local familiarity and established relationships also allowed them to gain access to physicians who had previously resisted participation in the initiative. One pharmacist increased physician participation by more than 100% in one centre.
- Opinion leaders helped improve the credibility of the initiative. Our initial plan was to co-opt local physicians to serve as opinion leaders and to have them consult with their peers about the guidelines. However, we encountered difficulties in finding local opinion leaders and instead recruited an opinion leader from Edmonton, an internal medicine specialist. This has proved to be a popular learning approach with participating physicians. In Calgary, we have employed a different model, using topic-specific opinion leaders.
- We offer physicians the opportunity to trial or sample the initiative before making a full commitment. For example, newly recruited physicians can receive academic detailing and/or opinion leader consultation, but not continuing education or comparative prescribing feedback reports. Approximately 10% of physicians receive sample or trial detailing visits.
- We foster long-term, individual relationships. As the relationships between detailers and individual physicians mature beyond basic information exchange, and comfort levels increase, discussions became more meaningful. Detailers are able to identify common uncertainties in family medicine practice and specific educational needs relating to the clinical practice guidelines.

As the relationships between detailers and individual physicians mature beyond basic information exchange, discussions became more meaningful.

Considerable time and effort is required to create and maintain relationships, but this was identified as critical to the success of our early KT activities. As our initiative continues to mature and expand, it is expected that additional challenges will need to be addressed at both the system and front line levels. We need to know more about the optimal structures and processes for effective relationship building, and we need to be able to determine if the interventions produce better outcomes when they are conducted in settings where established relationships exist. We also need to know if specific KT activities are more effective than others where established relationships exist.

Conclusions and implications

Several encouraging developments suggest that our initiative will have broader uptake. First, another government drug plan manager, Health Canada (First Nations and Inuit Health Branch–Alberta region), has joined our group of key stakeholders because of their interest in the project. Second, five provinces conducting academic detailing initiatives have joined forces to create the Canadian Academic Detailing Collaborative. This group has secured funding from Health Canada to evaluate processes and outcomes resulting from national collaboration. Third, the Canadian Optimal Medication Prescribing and Utilization Service (COMPUS) has been created by the Canadian Coordinating Office for Health Technology Assessment to coordinate evidence-based reviews and the development of change management tools. As COMPUS becomes operational it will enhance our capacity to conduct KT activities by making tools available for KT, assessing KT strategies relating to appropriate medication use, and reviewing methods for evaluating KT activities like academic detailing. Fourth, at least two Alberta local primary care networks have integrated academic detailing as a service for primary care physicians. In a recent external program evaluation of ADUP, an accelerated expansion of the initiative was identified as a major strategic activity for our future plans.

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PILOTING KNOWLEDGE BROKERS TO PROMOTE INTEGRATED STROKE CARE IN ATLANTIC CANADA

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The use of knowledge brokers to increase interaction between researchers and decision makers has attracted increasing attention as a knowledge translation (KT) approach. Researchers at the Atlantic Health Promotion Research Centre and Dalhousie University investigated how knowledge brokers affected decision maker uptake of best practices in integrated stroke care in the Atlantic provinces. They found that knowledge brokers can enhance partner interactions, but needed to develop effective strategies for creating partnerships and engaging participants. They also required excellent communication skills and a high level of proficiency in the subject matter.

Background

If individual and organizational change were easy, the KT process would be simple. But resistance to change is widespread[1] and progress towards improving the health care system tends to be slow.[2]

The knowledge translation literature suggests that health system change and the creation of evidence-based policy can be enhanced by increasing interaction and communication between researchers and users of research.[3] Knowledge brokering, which is defined by the Canadian Health Services Research Foundation as the human force that makes knowledge transfer more effective by bringing people together, has gained currency as one approach to help researchers and users of research work together more effectively.[4]

Knowledge brokers can also be described as facilitators between two communities.[5] Their role is to make things easier: by building relationships, uncovering needs, sharing ideas, and promoting action.[4] In 2003, the Canadian Stroke Network funded the Atlantic Health Promotion Research Centre and Dalhousie University to examine the effectiveness of using knowledge brokers for increasing exchange between stroke researchers and the users of stroke research. The goal was to increase decision maker uptake of best practices in integrated stroke care.

The KT initiative

Our primary objective was to observe and describe how knowledge brokers affected decision maker uptake of new evidence supporting changes in stroke care in four provinces: New Brunswick, Newfoundland, Nova Scotia, and Prince Edward Island. The project used work done in Ontario on integrated stroke care as a template for how an integrated stroke strategy could be created and implemented in the Atlantic provinces.

To accomplish this, we established teams of representatives from each province's department of health (who had a policy making role) and each province's Heart and Stroke Foundation branch (who, through their awareness of stroke research, acted as a resource base). Each team was then responsible for hiring a knowledge broker and articulating province-specific goals for the project. The teams drafted memoranda of agreement, decided which partner would house the knowledge broker, identified goals for the knowledge broker and outlined how the goals would be accomplished.

Prince Edward Island, New Brunswick, and Newfoundland identified the creation of provincial integrated stroke strategies as the goals for their knowledge brokers. In Nova Scotia, the Department of Health was already considering whether to implement the Heart and Stroke Foundation's recommendations for an integrated stroke strategy. The goal for the Nova Scotia knowledge broker was, therefore, to improve communication between the parties involved in implementing the strategy.

We provided the partners and the knowledge brokers with Atlantic-wide forums every six months. These forums disseminated information on best practices for stroke care, shared implementation lessons from Ontario, and provided networking time between teams. We also provided expert speakers on how telemedicine technology could be used in stroke identification and care, and supported knowledge brokers' travel to Ontario (to see a facility that had already implemented an integrated stroke strategy) and Yarmouth, Nova Scotia (to talk with researchers involved in the Yarmouth Stroke Project, an Atlantic Health Promotion Research Centre initiative to implement an integrated stroke strategy in a rural location).

We also acted as a resource and support base for the knowledge brokers. Monthly meetings or teleconferences provided an opportunity to share concerns and triumphs and to update researchers on what was going on in the provinces. In addition, the project coordinator traveled to the provinces on a regular basis. The knowledge brokers were also welcome to contact the researchers whenever they needed.

Results of the KT experience

Our project objectives were evaluated by analyzing data from key informant interviews and focus groups conducted with the knowledge brokers and the team partners. Success was judged by whether the existence of knowledge brokers increased knowledge exchange between the partners, increased decision maker uptake of new evidence supporting changes in stroke care, and helped the provinces accomplish their goals. The project formally finishes in March 2006, but improvements in partner communications and awareness of stroke care best practices have already been observed.

Prince Edward Island, New Brunswick, and Newfoundland are on schedule to complete their provincial integrated stroke strategies, which can be directly attributed to their knowledge brokers. As one interviewee said:

> *"I don't think without having somebody dedicated to the cause, it [the creation of an integrated stroke strategy], necessarily would have gotten off the ground this year…People who have been fighting for this kind of change for a number of years…were really feeling quite frustrated because they weren't getting the support they needed either from the Department of Health or from the Heart and Stroke Foundation because they just didn't have the resources…You really needed somebody in this position to help tie it together and to push it along."*

In Nova Scotia, the provincial government has committed money to an integrated stroke strategy. Although this decision cannot be directly attributed to having a knowledge broker, their broker did increase understanding of the best practices on stroke care in the provincial health districts and, through this, generated the support that was critical for moving ahead with an implementation strategy.

The knowledge brokers facilitated communication, cleared up misunderstandings and provided a dedicated person working toward system changes in collaboration with others within the system. With much time and effort the knowledge brokers also successfully formed multi-sectoral advisory committees, consisting of researchers, administrators, policy makers, and practitioners. This was a major task of most of the knowledge brokers, and in addition to helping accomplish the partner goals, these committees had the unforeseen benefit of being a good dissemination mechanism for best practices research to individuals outside the project.

Knowledge brokers were able to identify opportunities where best practices for stroke care could be integrated into existing provincial initiatives and where training and education was needed to improve care. As a result, decision makers are more aware of best practices for stroke care and researchers have a better understanding of the context affecting decision makers' uptake of research.

Lessons learned

Knowledge brokers can enhance partner interactions, but need to develop effective strategies for creating partnerships and engaging individuals to participate.

This initiative has demonstrated that knowledge brokers can enhance partner interactions, but brokers needed to develop effective strategies for creating partnerships and engaging individuals to participate. They also needed excellent communication skills and a high level of proficiency in the subject matter to meet the diverse demands of the partners.

Establishing partnership teams took longer than expected. Despite a prior commitment from the partners to work together, it took between 9 and 14 months for each team to agree on hiring the knowledge brokers. Critical factors that contributed to this delay were political change, availability of in-kind support, confidentiality concerns and questions about possible hidden agendas among the partners.

Another obstacle was that most provinces had not identified stroke as a priority condition, and no money had been dedicated to improving stroke care. This made the government partners hesitant to commit to the partnership, because they did not have financial resources to implement health system changes in stroke care. The provincial governments did have a mandate to improve chronic disease management and they eventually examined evidence on stroke care under that framework. But there was still no guarantee that support would be available for future health system changes. While the provincial Heart and Stroke Foundations were supportive of the project, some wanted to wait until there was a firm government commitment before they agreed to actively participate. In addition to these challenges, it was difficult for the researchers to be flexible enough to set project goals collaboratively.

Even after hiring the knowledge broker, and despite jointly developed goals, the teams often struggled because the partners had divergent mandates.

Even after hiring the knowledge broker, and despite jointly developed goals, the teams often struggled because the partners had divergent mandates. The Heart and Stroke Foundations felt obligated to promote funding for better prevention and treatment of stroke in the provincial budgets. Although the Departments of Health supported evidence-based care, they had limited resources available and wanted to make sure expectations were realistic.

Conclusions and implications

The knowledge broker role could be adapted to other situations. To date, other decision makers may not use them because of limited funds and a lack of understanding about the importance of improving communication. When finances are low, communication is usually not considered to be a priority, especially when resources barely cover the current demands on the system. But

Ongoing partnerships between government and non-government agencies or researchers need to be supported.

ongoing partnerships between government and non-government agencies or researchers need to be supported because governments usually do not have enough resources to scan the horizon for evidence that goes beyond their current needs. Conversely, in research, there is a continued need to understand the context in which evidence-based policy can be implemented. An increased understanding of context can help researchers identify processes to broaden government receptivity for new evidence. In the future, funding should be dedicated towards making this type of position financially sustainable because it has the potential to improve the quality of health care.

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THE TORONTO EAST NETWORK KNOWLEDGE CHAMPION PROJECT

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The Toronto East Network Knowledge Champion Project was designed to cultivate educationally influential hospital physicians to become agents of knowledge translation (KT). The project was a 24-month program of small group workshops and focused on case-based, data-driven learning in topic areas with known gaps between evidence and practice, as well as general skill development in interpreting data, applying evidence effectively, and KT theory. The first cohort of knowledge champions has reported significant changes in some of their participating hospitals, and has formed a community of learning to share best practices across their institutions.

Background

The translation of knowledge from the research community to the practitioner is complex and riddled with challenges. It can take years for research findings to become common knowledge and even longer for practice to actually change. The practice of evidence-based medicine is an ongoing concern within health care as individuals and organizations struggle to review, revamp, and revitalize care practices to reflect up-to-date knowledge generated through research.

Although it is recognized that clinicians should be central to such initiatives, they are rarely personally provided with the tools needed to create and sustain any real change in practice. Yet the literature indicates that "knowledge champions," or educationally influential physicians, can best influence KT by raising awareness and communicating information within their professional networks.[1] Such individuals are trusted and respected by their peers and their knowledge, willingness to answer questions, and communication style, are recognized as attributes which informally facilitate KT and practice behaviour change.[2]

The Toronto East Network Knowledge Champion Project was born out of a hospital-focused utilization review within the departments of medicine in the Toronto East Network (TEN) of hospitals. This review discovered a huge variance in outcomes for similar clinical conditions across the network. While such differences created obvious concern around quality and continuity of care issues, they also created an opportunity to develop an evidence-based education system that would create and support local knowledge champions, potentially reducing costs and improving care across the network.

In partnership with the University of Toronto Knowledge Translation Program, the Canadian Health Information Management Association (CHIMA), and the Canadian Institute for Health Information (CIHI), members of seven TEN hospital departments of medicine designed, implemented and evaluated a program that found, evaluated and disseminated evidence with a capacity to improve care; and provided innovative strategies to incorporate this evidence into daily practice through the development of local knowledge champions.

The KT initiative

The knowledge champion project cultivated physicians who were considered to be educationally influential faculty based on their interest in leading change and by peer nomination—both considered essential attributes in the change process. An education doctoral student specializing in teaching, learning, and curriculum provided the original curriculum design. A fluid framework was initially developed for selecting and designing educational interventions in topic areas where gaps between evidence and practice had been found in the utilization review. Theories of adult education were incorporated into the learning tools, learning needs were continuously evaluated, and both formal and informal learning opportunities were included in the program.

The program involved small group workshops with experts in each topic over a 24-month period. Workshops generally occurred monthly, with an independent module often assigned as follow-up to allow for learning transfer. A case-based, data-driven approach with "just-in-time learning" was used to improve skills such as interpretation of utilization data and evidence, clinical process mapping, identifying and selecting priorities for change, applying evidence for effective improvement, and applied change management and KT theory and applied methodology. Knowledge and content expert teachers were drawn from their fields of expertise. All faculty encouraged interactive, hands-on learning and where possible, allowed for immediate learning application.

One clinician per hospital was chosen to participate, and, as part of the expectations for the program, completed a practice review within their hospital by applying the knowledge from the workshops to determine best practice for a selected case mix group. The physicians sought out data of interest to them and their specialty and were able to study comparative data between hospitals, which provided them with a foundation of evidence with which to begin the change process. At the end of the program the physicians presented their case studies, which included data utilization and KT strategies.

In addition to the formal case studies, physicians were encouraged to bring information or issues from their practices and institutions to provide relevance to their learning and to facilitate continued application of the theory learned after the session. For example, when partners from the Ontario Guidelines Advisory Committee came to present on guideline development, participants brought in examples of guidelines from their hospitals which needed work.

Unique to this initiative is that it was the first inter-hospital project to make use of eCHAP, a secure web-based tool developed by CIHI with powerful query capabilities. eCHAP can provide physicians with the capacity to quickly and easily "drill down" into their hospital's utilization data and carry out comparisons with TEN-specific regional and national comparators. The physicians involved in the knowledge champion project are now able to apply their newly acquired tools to the data in order to support their findings and plan for best practice changes. For instance, some physicians looked into the data and determined that a length of stay variance occurred when patients were admitted on different days of the week. Physicians then compared their care practices to those they found in literature, in guidelines and in affiliated professional organizations.

Paralleled with the educational sessions, inter-professional partnerships between several groups within each hospital were encouraged, such as with health librarians, health record professionals, CHIMA, CIHI, and the Knowledge Translation Program at the University of Toronto. An external vendor, Ovid Technologies, also fully supported the project by enabling the purchase of handheld PDAs for all participating physicians. The PDAs provide easy access to Ovid information database systems, the Guidelines Advisory Committee guidelines and evidence-based medicine resources.

Results of the KT initiative

Participants reported heightened awareness of best practice opportunities and ongoing use of the tools to facilitate use and dissemination of evidence-based medicine.

The most significant measure of success of this project is that it continues to evolve, improve, and spread as the need increases. Participants reported heightened awareness of best practice opportunities and ongoing use of the tools to facilitate use and dissemination of evidence-based medicine to change practice within their home institutions.

Results include an increased understanding of change management for participating physicians, significant practice changes in some hospitals based on the data case studies, and others more actively assessing information to determine where practice changes are required. Participants also reported an increase in questions and interaction from colleagues and that the theories learned were very useful in facilitating other system changes. Most importantly, these physicians formed a learning community. They were able to support each other's efforts and improvements by understanding similar barriers and challenges and by working on solutions together, as a team.

Lessons learned

The key to the overall success of this project was the physician commitment, willingness to learn and excitement about the opportunities to expand their knowledge and implement evidence-based medicine on an ongoing basis. While some of the physicians received a financial incentive to support their involvement in the program, it is important to note that the physicians who received no incentive remain as involved and active as those who did.

Equally vital to the continued commitment of the knowledge champions was a supportive organizational environment. The organizational support enabled the physician participants to attend meetings, have access to appropriate evidence, review the present practice, and develop and present a case study for change. This, like all things in health care, benefited from teamwork, continuous communication and evaluation, and an understanding of the physicians' environment and work. The role of a project manager or resource support person should also not be minimized, as there must be a dedicated team member who can be focused on moving the work forward and supporting the physicians.

The key to the overall success of this project was the physician commitment, willingness to learn and excitement about the opportunities to expand their knowledge.

Conclusions and implications

As a result of their work in the knowledge champion project, this group of physicians continues to identify further opportunities to strengthen the translation of evidence-based medicine into practice. Sustainability as a community of learning is evident as the physicians are now developing an e-hospital project which will allow virtual access to best practice guidelines and standardized order sets across the TEN network. The guidelines and order sets will be evidence-based, updated regularly with the click of a button, and easily accessible at the point of care using e-solutions. The commitment of this team to expand cross-institutional sharing of best practices has now been recognized by funding from a peer-reviewed granting agency.

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ADVANCING THE NURSE PRACTITIONER ROLE IN BRITISH COLUMBIA

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This project brought together a team of researchers and decision makers to conduct policy-relevant research to support the introduction of advanced nursing practice roles in British Columbia. All team members, including decision makers, were actively involved in the conceptualization, design, data collection, analysis and interpretation of the study. This level of engagement, coupled with ongoing knowledge translation (KT) activities, led to a majority of the study's recommendations being implemented by stakeholders. The results have since been used to guide legislative and regulatory development, and to design a nurse practitioner education program.

Background

In 2001, the Canadian Health Services Research Foundation (CHSRF) funded us to study the opportunities and challenges for advanced nursing practice (ANP) in British Columbia. Nurses working in ANP roles have been shown to provide appropriate and cost-effective continuity of care.[1,2] However, widespread adoption of advanced nursing practice has been hampered by considerable confusion and debate about definitions, roles and functions, as well as the required competencies, practice environments, educational qualifications, credentials, regulations and legislation.[3]

This project aimed to bring researchers and decision makers together to conduct policy-relevant research that would support the introduction of new ANP roles, including nurse practitioners, in B.C. Our research objectives were to: clarify the understanding of ANP and related roles within the health care system; identify the current status of ANP in B.C.; identify gaps in health care services that might be filled by the expansion/introduction of new nursing roles; explore and describe models of ANP in other jurisdictions; identify barriers to implementing new nursing service delivery models in B.C.; and, on the basis of the above analysis, identify and recommend future policy directions for new nursing roles and models in B.C.

The project team, which was convened by the B.C. Ministry of Health, included researchers, educators, government and health authority decision makers, and nursing regulators. An advisory group, who provided advice and feedback on research methods and findings, included representatives of the public, other health professions (e.g. midwifery, medicine, pharmacy) and other constituencies (e.g. seniors, First Nations and Inuit Health Branch, British Columbia Nurses' Union).

The CHSRF funding strategy required co-funding arrangements, involving both cash and in-kind contributions from a variety of national, provincial and local sources. Our co-funders included the Nursing Research Fund, the B.C. Health Research Foundation, the B.C. Ministry of Health, the Registered Nurses Association of B.C., Capital Health Region in Victoria (now Vancouver Island Health Authority), and the

University of Victoria. Some of the funders were also research partners and appointed representatives to the research team.

The KT initiative

All team members, including decision makers, were actively involved in the project throughout the study, from conceptualization and design through to data collection, analysis, and interpretation.

Our study was carried out in three phases, with KT goals incorporated directly into the research process. All team members, including decision makers, were actively involved in the project throughout the study, from conceptualization and design through to data collection, analysis, and interpretation.

In Phase 1, data were gathered through telephone interviews and focus groups with nurses in a variety of roles and settings to determine how they understood ANP and how nurses in ANP roles were deployed in B.C. An email survey was conducted with employers to determine their understanding of ANP and to identify health service priorities, gaps in service, and the potential for introducing new ANP roles in their organizations.

In Phase 2, we conducted five case studies of models of ANP in other jurisdictions to understand the nature and benefits of advanced practice, and to determine the feasibility of various service models for B.C.

Phase 3, which also comprised our major KT activity, was a provincial think tank attended by almost 100 key stakeholders to discuss preliminary research findings and generate policy recommendations. Not only did the think tank provide important data for Phase 3, but it also provided for dissemination of the preliminary findings to a broad stakeholder audience and acted as a mechanism to test the validity and relevance of our results for informing policy recommendations.

Decision maker and researcher team members conducted interviews and observations and actively participated in analyzing and interpreting the data. We learned from other research teams funded in the same CHSRF competition that the full engagement of decision makers at all phases of the research was unusual, and we believe that this level of involvement contributed to the successful use of the research findings.

Decision maker partners also took a leadership role in developing the overall KT plan and strategies that were consistent with the information needs and preferred communication mechanisms of our audiences. Other KT activities included:

- Regular status reports to senior administration in all partner organizations;
- Sharing interim and final reports with multiple audiences, including the Federal/Provincial/Territorial Advisory Committee on Health Human Resources and all partner organizations;
- Creation of a website that included descriptions of the projects, regular updates, project reports, links to other resources and a mechanism for visitor feedback; and
- Presentations by members of the research team to various partner organizations, including Ministry and employer policy rounds.

The project's advisory group was also an important mechanism for KT, through our ongoing communication and their ability to distribute information through their networks. The advisory group also participated in the think tank.

Results of the KT initiative

Our KT strategies resulted in substantial buy-in from stakeholders and facilitated implementation of a majority of the study's recommendations in the following two years. The results were used directly in an instrumental fashion[4] to develop nurse practitioner competencies and practice standards, to guide legislative and regulatory development and to inform the development of at least one nurse practitioner education program. Five articles based on the study have been published to date.[5-9]

Instrumental use of research findings, which is defined as acting on research in specific and direct ways, is reported less frequently in the literature than conceptual or symbolic use.[4,10] Although we did not have a formal evaluation plan to assess the KT strategies, we recognized that success indicators would include the actual implementation of study recommendations and this did occur. In addition, the entire team engaged in a reflective exercise on the benefits and challenges of the partnership experience.

Lessons learned

Decision makers and researchers operate on very different time frames.

The research partnership was clearly a successful venture. Nonetheless, we had to deal with the challenge of negotiating and mediating our differing interests. Decision makers and researchers operate on very different time frames, with decision makers often under pressure to produce swift results. In the time between writing the original research proposal and getting it funded, the political context changed dramatically and we were under pressure to produce data much more quickly.

But the tension between the researchers' needs to maintain scientific rigour and the decision makers' needs for information actually created an opportunity for us to understand each other's approaches, as well as the demands and perspectives of our different work processes. At times, the researcher team members were somewhat frustrated by the demand to speed up study timelines, but through education, negotiation, and prioritizing, we developed strategies (e.g. additional funding provided by government to focus on specific areas of data collection) that met the decision makers' time-sensitive information needs, while maintaining scientific rigour.

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Although there were clear research goals, each team member had a somewhat different vision for the project and different reasons for engaging in the research process. These differences added depth to the research, but also needed to be negotiated as they emerged in subtle ways to create tensions and disagreements. Autonomy and academic freedom are core values in universities. The ability to speak openly and freely is both encouraged and expected. In the partner organizations, decision makers operate within a policy context that explicitly and implicitly governs their work and that may, at times, preclude the expression of opinion.

Within the research team, the same data also meant different things to different people and we needed to negotiate how the data were interpreted, reported, and disseminated. To complicate the situation, universities and organizations have differing reward systems, which influenced, more than we anticipated, the direction each of us wanted to take on particular issues, such as the focus and slant of a particular journal article.

Our ability to negotiate and mediate all of these differences was made possible by several team characteristics, including:

- The steadfast commitment of all partners to the research enterprise and the goals of the project;
- The willingness of team members to compromise;
- Trust and respect for each other based on established prior relationships;
- Researchers who had been policy makers and policy makers who had been researchers, with understanding of the values and constraints faced by each partner; and
- Decision maker team members with the authority and accountability to make important decisions, and to make and honour commitments.

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Conclusions and implications

Our research experience and our findings have been used extensively by our own organizations to inform policy and program development. The results have also been used outside the original partnership. For example, the Canadian Nurses Association held an invitational forum in the fall of 2005 on advanced nursing practice and some of our published research was used to inform the discussion and debate about the direction of ANP in Canada. Our final report has been used and cited by other nursing education institutions in the development of graduate programs in advanced nursing practice. On a national level, the findings of this research have informed discussions of a Primary Health Care Nurse Practitioner Education task force. Finally, this research provides the starting point of a longer-term program of research that will include many of the original research team.

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ADOPTING MEDICATION RECONCILIATION AND SEAMLESS CARE SERVICES

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Medication reconciliation and seamless care services can dramatically reduce adverse outcomes resulting from gaps in the medication use system. A long-running initiative to promote these services as standard care was sparked by innovative hospital and community pharmacists, and subsequently taken up by two national pharmacy associations. A series of wide-ranging knowledge translation (KT) activities, including a joint task force on seamless care, national and regional workshops and the publication and dissemination of educational materials, has resulted in these services transitioning from isolated pilot projects to the focus of national patient safety efforts in less than 10 years.

Background

As patients transition across the health care system, gaps in medication use between physical environments, such as hospitals and community pharmacies, can adversely affect health outcomes. The provision of medication reconciliation and seamless care services can dramatically reduce adverse outcomes such as drug-related problems, inconsistencies, and omissions.[1]

Seamless care is "the desirable continuity of care delivered to a patient in the health care system across the spectrum of caregivers and their environments."[2] Medication reconciliation, one component of seamless pharmaceutical care, ensures the collection and communication of accurate patient medication information, with a goal to facilitate continuity of pharmaceutical care for patients at the beginning and/or the end of service.[3] These activities typically involve having a health professional, usually a clinical pharmacist, review the patient's medication profile prior to discharge to ensure the patient is taking the correct medications, doing a full pharmaceutical care work-up and communicating relevant information to the next care provider.

This KT initiative consisted of understanding and addressing gaps in the medication use system through the implementation of medication reconciliation and seamless care services. The goal was to move medication reconciliation and seamless care from infrequently provided services to a recognized standard of care. The audiences for this research include health care executives and administrators, health professionals, health care regulatory agencies, and others involved in improving the safety and effectiveness of the medication use system.

The KT initiative

A wide variety of partners participated (and continue to participate) in this initiative. In the mid- to late 1990s, innovative hospital and community pharmacists across Canada conducted several independent pilot projects aimed at determining the feasibility of medication reconciliation and seamless care services. Sensing the need for coordination of activities in this area, the Canadian Society of Hospital Pharmacists (CSHP) and the Canadian Pharmacists Association (CPhA) formed a joint task force on seamless care and co-hosted a national workshop in 1998 in Ontario. The aims of the workshop included increasing awareness of the experience of providing seamless care and identifying mechanisms to move the seamless care effort forward.[2] A second workshop was held in Quebec in 2000 to share and develop tools to assist in the delivery of seamless care.[4] Several regional workshops followed to share more success stories and to train other community and hospital pharmacists. A randomized, controlled trial consisting of 253 patients testing these services was conducted over

2000-2002 at The Moncton Hospital in New Brunswick.[1] In this study, pharmacist-directed seamless care services were found to have a significant impact on drug-related clinical outcomes and processes of care.

Learnings from these studies for others wishing to implement these services were incorporated into a "how-to" book—*Seamless Care: A Pharmacist's Guide to Providing Continuous Care Programs*[5]—that was published by CPhA in 2003. A particular effort was made to ensure uptake of the book by the educational community by obtaining sponsorship for its purchase for all the attendees of the Canadian Association of Pharmacy Students and Interns 2003 Professional Development Week (approximately 550 students). Copies of the book were also provided to the deans of Canada's nine faculties of pharmacy, and faculty at the 2003 Canadian Pharmacy Administration Teachers' Conference.

Results of the KT initiative

In less than 10 years, these services have progressed from being evaluated in pilot studies to now being the focus of national patient safety efforts.

This multi-pronged KT approach has had a substantial impact on the adoption of medication reconciliation and seamless care services across Canada. In less than 10 years, these services have progressed from being evaluated in pilot studies to now being the focus of national patient safety efforts.

In 2004, CSHP released an official statement supporting the implementation and provision of seamless care services.[6] Further evaluation of pharmacist-directed seamless care services is presently occurring with a new randomized, controlled study involving cancer patients in Newfoundland and Labrador. Recently, much activity has focused on medication reconciliation, a subset of seamless pharmaceutical care. The reason for this shift remains unclear but may, in part, be due to the promotion of medication reconciliation in the United States. Medication reconciliation services have been adopted in the 2005 Canadian Council on Health Services Accreditation (CCHSA) patient safety goals, and in the Safer Healthcare Now! campaign of the Canadian Patient Safety Institute (CPSI). These two initiatives will go a long way toward moving medication reconciliation and seamless care into an accepted standard of practice. Hopefully, institutions or organizations that adopt medication reconciliation practices will use them as stepping stones to the full implementation of comprehensive seamless pharmaceutical care.

Still, there is much work to be done. While adoption of these services has generally occurred at the hospital to community transition point, much effort will be required to eliminate other gaps, such as those from the community to hospital, hospital to long-term care facilities, and even at transition points within hospitals. The inclusion of medication reconciliation services in the CCHSA patient safety goals provides a powerful incentive for all hospitals to provide these services, but also creates challenges for hospital pharmacy directors and others involved in implementation, given the current shortage of hospital pharmacists and budgetary restraints. Training programs, such as those recently sponsored by the CPSI in Alberta in May 2005, should help overcome some of the implementation barriers. There will also be operational and workload considerations for community pharmacists; at this time, these have not been adequately addressed.

The adoption of these services beyond just the pilot sites and the initial participating pharmacists has been one of the most satisfying aspects of this KT initiative.

One positive change is that these services are no longer being promoted primarily by the pharmacy profession. Indeed, health care executives and other health professionals, such as physicians, nurses, and risk managers, are now increasingly involved in their uptake. This provides further evidence of the success of this KT initiative—it is no longer a discipline- or profession-specific activity, but instead is a valued service recognized by health care decision makers, clinicians, and ultimately by patients, who experience it first-hand. The adoption of these services beyond just the pilot sites and the initial participating pharmacists has been one of the most satisfying aspects of this KT initiative.

Lessons learned

Looking back, what were the keys to success for this KT initiative? Several are apparent, and include:

- The uptake of seamless care and medication reconciliation by front line pharmacists who believed in these concepts and were able to convince others of their value;
- The cooperation of hospital and community pharmacists at the local, provincial, and national levels;
- Engagement of the pharmacy practice research community, so evidence of the value of these services could be obtained;
- A proactive effort to shift participation from the idea champions and change leaders to others through the use of national and regional workshops; and
- Training future pharmacists on these services.

No KT initiative occurs in isolation and credit must also be given to external events that influenced our activities.

No KT initiative occurs in isolation and credit must also be given to external events that influenced our activities. Hepler and Strand's articulation of pharmaceutical care as the practice model for the pharmacy profession in the late 1980s and early 1990s did much to pave the way for increased responsibilities for pharmacists in all practice settings.[7] More recently, the awareness of patient safety issues, in both those working in the health care system and in the general public, has risen considerably. In the past five years, the publication of several sentinel reports in Canada and the United States, and the creation of the CPSI, has done much to increase our knowledge about the magnitude of preventable drug-related morbidity, medication errors, and other adverse outcomes of medication use. The CPSI has also stimulated the search for tools and techniques to improve the safety of the medication use system.

Despite these successes, there are still several goals related to seamless care and medication reconciliation that have yet to be achieved. At this time, there are few published evaluations of these services in the peer-reviewed literature. The National Association of Pharmacy Regulatory Authorities or the provincial regulatory bodies have yet to mandate the provision of these services, and reimbursement or compensation for those providing such services is still lacking. Additionally, technology such as linked prescription profiles and health cards could potentially play a large role in facilitating these services, but at this time remain underutilized.

Conclusions and implications

This initiative was an effective model for combining the efforts of national professional associations, practitioners, and researchers. For the pharmacy profession, it provides a powerful example of taking one small aspect of the medication use system and ensuring that it is widely adopted. For those outside the pharmacy profession, it provides a tangible example of how a simple, yet essential, element of the health care system can move from the exception to the norm in a relatively short period of time, through the partnership of front line health professionals, health care management, professional associations and researchers.

> *It provides a tangible example of how a simple, yet essential, element of the health care system can move from the exception to the norm in a relatively short period of time.*

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NATION-WIDE KNOWLEDGE TRANSLATION TO PROMOTE RESEARCH ON SENIORS' INDEPENDENCE

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The end of multiple Canadian programs of research on seniors' independence sparked a nation-wide knowledge translation (KT) project to engage stakeholders in widespread uptake and application of the research. Bringing policy makers, program planners, service providers, educators, seniors' advocacy groups, and researchers together, the project focused on knowledge spread, exchange, choice, and action. While knowledge spread and exchange activities were highly successful, a focus on consensus-building actually reduced attention to the comprehensive knowledge available for uptake. However, as the exercise progressed, valuable relationships and networks for collective action emerged, achieving a previously unacknowledged goal of building social capital.

Background

In 1998, 14 Canadian programs of research on seniors' independence came to a close. Both the Health Canada funders and the researchers wanted to see the results used to promote the health and independence of aging Canadians. Health Canada funded a three-year KT project to engage numerous stakeholders—policy makers, program planners, service providers, educators, seniors' advocacy groups, and researchers—in activities that fostered widespread experiential learning and application of the research and to evaluate related knowledge spread, exchange, choice and uptake.

The idea was to create a "community of knowing"[1] using a social interaction model of KT that exposes researchers and the potential research users to each other's worlds and needs. This model treats the users as active individuals who interpret research evidence in light of what they already know.[1,2] Researchers, policy and program planners, health services decision makers and professionals, senior consumers and advocacy groups, educators, and the public would work together, as both the agents and architects of evidence-based change. We wanted to *spread knowledge* across Canada; get people from all the stakeholder groups to *exchange knowledge* about the evidence, issues, priorities and potential actions; get them to choose what key evidence they would apply; and get them to act to improve health policy, services, and care. In accordance with other estimates of people's inclination to take up knowledge, we hoped to see 15% more people reporting an awareness of and action on the research evidence, and a 15% increase in their self-reported levels of knowledge and action.[3,4]

The KT initiative

The Health Canada funders and the researchers first constructed a list of opinion leaders for each of the stakeholder groups, from which they then appointed a National Consensus Committee (NCC) to lead the process. Members included 20 high-profile Canadians representing federal and provincial health, social service, seniors, and economic policy personnel; service planners; health and social service providers and their professional associations; seniors advocacy groups, senior consumers, and public representatives; and academics from centres on aging and the diversity of health and social service fields.

The committee developed a KT plan and involved other opinion leaders and their constituencies. The Canadian Association on Gerontology (CAG), comprising 800 members representing all stakeholder groups, facilitated connections and activities. The NCC then identified knowledge experts in four key research areas and contracted teams of researchers to review the relevant research evidence.[5] From these academic research syntheses, sub-committees identified key, actionable messages for each theme. These messages were posted on an interactive website, shared at symposia at three annual scientific and educational meetings of the CAG, and highlighted in lay print materials and theme-based policy fact sheets. The network of opinion leaders used their connections and influence to disseminate these materials and to engage others in knowledge spread.

Knowledge exchange and choice were facilitated through the interactive website, symposia at annual CAG meetings, and numerous discussions staged by participating organizations. Participants in both face-to-face meetings and users of the website were asked to rate given priorities for policy developments and service and practice refinements in each theme area, and the questionnaires were constantly reviewed and updated to reflect their feedback.

These activities enabled participants to integrate their knowledge, values, and priorities with the research evidence, and to work towards consensus on priorities and potential action. Four theme-related consensus panels comprised of policy, programming, provider, academic, and senior consumer experts then synthesized the selected messages and priorities, prepared recommendations for action, shared their reports and served, along with the lead committee, as moderators, discussants and champions of change at theme-related symposia. Subsequently, a single large consensus-building symposium brought the four thematic panels and a broader audience together with the intent of optimizing social interaction and support for knowledge choice and uptake.

Results of the KT experience

To measure knowledge spread, exchange, choice, and uptake, participants at both the CAG symposia and users of the interactive website were surveyed as they joined the exercise, immediately after activities ended, and one year later. Qualitative analysis of minutes and field notes of meetings and symposia and open-ended survey answers also added insights.

We determined that research evidence was spread through 86 activities to 2,946 initial contacts who attended the symposia or accessed the website, including 186 organizations, and through them, as reported in follow-up questionnaires, to 63,387 people, an unaccountable percentage of whom represented additional organizations. The website questionnaire series engaged 608 organizations and individuals. Several organizations and policy and planning personnel used the fact sheets and sought out the experts identified therein as resources for knowledge exchange activities. Academics and professionals used the print materials for foundational and continuing professional education.

However, the target increases in the numbers of people reporting awareness and action, and their reported levels of awareness of and action on the evidence were not met, perhaps because a high percentage of participants was aware of the research evidence at the outset of the exercise. While there was positive change, gains were small, and self-reported levels of awareness increased significantly in only one theme area. At the outset, over half of those participating in each of the four theme areas indicated that they had already chosen to use the research evidence for acting on issues or for informing previously-decided directions. Nevertheless, requests for materials and expert resources for two years after the exercise ended suggested that knowledge uptake continued. Qualitative findings revealed that the further goal of these knowledge spread activities, the consensus-building strategy, elicited frustration because of the repetitiveness of the knowledge choice activities and concern about the priorities that emerged.

Lessons learned

Our knowledge spread and exchange activities were judged to be extremely successful and are still referenced by Health Canada policy personnel. The consensus-building process, on the other hand, actually reduced attention to the comprehensive knowledge available for uptake. In addition, participants sometimes replaced issues and priorities premised on the research evidence with unrelated concerns, taking the discussions in unanticipated and often contested directions.

As the exercise progressed, participants became less focused on knowledge uptake per se and more focused on building relationships and networks for collective action.[6] Accordingly, the ultimate goal of fostering seniors' independence was achieved as a process output rather than as concrete outcomes in the form of evidence-based policies, programs, and practice change. Seniors, their advocates, and public opinion leaders ranked the opportunity to be involved and to be heard as the most valuable aspect of the exercise. Receiving information for making change and enhancing their own knowledge was less important to them.

If the goal of building social capital had been more widely acknowledged and accepted at the time, the value of this KT exercise may have been more widely appreciated. While individual participation in such activities normally declines over time, in this exercise, organizational participation was sustained, increased, and created new activity.

Conclusions and implications

There is no easy way to ascertain how knowledge is spread through outreach strategies or whether people who receive the information actually attend to it. In fact, the assessment of knowledge choice and uptake in specific topic areas is somewhat artificial, as each stakeholder group can do little or nothing about issues beyond their mandate. Participants move in and out of knowledge exchange and choice activities over time, making tracking of outcomes difficult. Furthermore, the complexity and political nature of the policy process precludes confident conclusions about outcomes. New approaches for evaluating the process of KT are needed, with greater reliance on qualitative evaluation of the processes, quantitative measurement of process outputs and more longitudinal follow-up of outcomes.

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Increasing action through building consensus across diverse stakeholder groups is an elusive ideal demanding close attention to what values, and whose, come into play.[7] The political nature of consensus-building was a huge challenge. But political processes are an inevitable part of life and if we are committed to participatory democracy, we need to build in enough time to allow it to transpire. Sequenced activities and longer timeframes to allow stakeholder groups to build consensus between and among their respective constituencies might help.

For anyone committed to KT that fosters enlightened, empowered, and socially just effort on behalf of vulnerable groups, this KT process is worthwhile. Rather than being a top-down, authoritative model, our activities appealed to people at the grassroots of public policy and service delivery. And, who knows better than those at the front lines experiencing and enacting public policy and delivering services what is most important, how the research evidence fits with what will work and how the evidence can be used to make effective refinements. On the other hand, the approach is process-focused; all participants share responsibility and accountability for it, and its outcomes cannot be controlled. In a world where performance appraisal is premised on measurable outcomes, this approach is not likely to advance the professional careers of academics, or those of senior policy personnel, planners, and decision makers.

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KT IN ACTION:
MANITOBA'S *THE NEED TO KNOW* TEAM

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The Need To Know Team

Manitoba's The Need to Know Team fosters collaborative, population-based health research between rural and regional health authorities, the province's department of health, and researchers at the Manitoba Centre for Health Policy. With a focus on new knowledge creation and development, individual and organizational capacity building, and research dissemination and application, the Team has made important contributions to rural and regional health planning in the province, and has won national recognition as a best practice model for knowledge translation (KT).

Background

Stories can be powerful motivators of change. Our story—the origins of Manitoba's *The Need To Know* Team, the successes and challenges we have experienced in KT and the outcomes of this collaboration—is about what can be achieved when researchers and decision makers truly collaborate in research and its translation into action.

> *The realization that better research could result from user collaboration led to the vision, and eventual birth, of The Need To Know Team.*

The Need To Know Team is a collaboration of: the Manitoba Centre for Health Policy (MCHP), a unit of the Department of Community Health Sciences, University of Manitoba; the ten rural and northern Manitoba regional health authorities (RHAs); and Manitoba Health. It is funded through CIHR's Community Alliances for Health Research program (2001-2006). The goal of the team is to: create new knowledge directly relevant to rural and northern RHAs; develop useful models for health information infrastructure, training, and interaction that increase the capacity for collaborative research; and disseminate and apply health research to increase the effectiveness of health services and the health of RHA populations.

The Need To Know Team evolved out of a contractual relationship between Manitoba Health and MCHP. Since 1991, MCHP has produced six research projects a year on the health and health care use of Manitobans. To encourage research dissemination, in 1994 MCHP began offering an annual Rural and Northern Health Care Day that highlights research of relevance to non-Winnipeg regions. In 1999, this workshop became highly interactive, with researchers facilitating RHA roundtable discussions to encourage planning based on MCHP reports. This new approach also gave RHA participants the opportunity to identify limitations in the research. The realization that better research could result from user collaboration led to the vision, and eventual birth, of *The Need To Know* Team.

The KT initiative

The Need To Know Team's KT vision is based upon three key themes: the need to undertake collaborative research of relevance to the intended users; the importance of capacity building and effective working relationships; and the need for researchers and planners to communicate findings and plan strategies to facilitate research that influences decision making.

The Need To Know Team includes MCHP academic researchers and graduate students, six planners from Manitoba Health, and up to two high-level planners, selected by the CEOs, from each of the ten non-Winnipeg RHAs, plus one Winnipeg RHA liaison. An advisory committee comprised of the director, program evaluator, three elected Team representatives (from northern RHAs, southern RHAs, and Manitoba Health), and representatives of key stakeholder groups (MCHP, Manitoba Health, the RHA CEOs, and a health services researcher) guides the initiative.

Two-day meetings, held three times a year, serve as the focus for Team activities. These meetings provide the forum for: selection, development and interpretation of Team research projects; participation in capacity-building activities (for example, "101" sessions on research concepts and methods); planning for dissemination of the research; and opportunities for both structured and informal networking. Capacity-building activities are not limited to a focus on RHA Team members. Team meetings provide an opportunity for academics to develop an understanding of the context faced by decision makers, as well as for decision makers to increase their understanding of research.

The research projects are selected through consensus, and speak to the questions facing RHA decision makers. They are grounded in strong health services and population health research methodologies and rely upon population-based administrative claims data to produce cross-comparative, geographically-relevant information. Three research projects have been completed to date: a regional indicators atlas[1] showing health status and health care use patterns by RHA, district, and over time; a mental illness report[2] documenting the prevalence and health care use patterns of people with mental illness; and a sex differences report[3] analyzing male/female differences in health, health care use, and quality of care.

Between meetings, Team members undertake "homework" activities. Examples include consulting with RHA management on future research topics and developing research dissemination plans. For example, in spring 2005, Team members from five different RHAs planned one-day interactive MCHP/RHA workshops to ensure translation of the Team's research projects at the organizational level.

Collaborative evaluation has been an essential guiding component of the project from the very beginning. A variety of methods (key informant interviews, participant observation, pre- and post-test surveys, anonymous workshop evaluations, unobtrusive measures) are used. A structured feedback process enables each stakeholder group to review and provide input into the draft evaluation reports, and evaluation activities are used to model research principles and concepts. The evaluation process and activities, along with key findings, have been documented in two evaluation reports[4,5] and have contributed to further development of KT theory.[6]

Results of the KT experience

Has *The Need To Know* Team been successful at meeting its objectives? We have succeeded in producing research of high quality and relevance to rural and northern RHAs. RHA attention to research findings has helped spur development of primary health care centres and nursing homes, cervical cancer screening programs, regional injury prevention programs, and proposed changes to mental health services.

The regional indicators atlas is being used extensively in strategic planning, and the mental illness report is contributing to regional, provincial, and national (through Senator Kirby's commission) mental health service planning. Team reports are in high demand, with seven times the number printed compared to typical MCHP reports (1,500 versus 200 copies). Hits to MCHP's website increased by 20,000 during the months when these reports were released.

The Team's reports are now released at the annual Rural and Northern Health Care Days. Attesting to the workshop's popularity, attendance has grown from around 30 in the 1990s to over 160 in the past two years. RHAs encourage diverse groups to attend, including board members, CEOs, VPs of planning, medical health officers, physicians, senior nurses, and front line workers. RHA Team members are now the principal facilitators of the RHA discussion groups, co-facilitated by MCHP staff. According to evaluations, the RHA Team members in this setting are indistinguishable from MCHP academics in understanding and interpreting research findings for participants.

Lessons learned

We have found storytelling to be a powerful tool to affect change in decision-making behaviour. *The Need To Know* Team members challenge each other to look for stories, or "golden nuggets," in each research report. This *evidence-based story-telling*[7] helps identify important issues for RHA planners and decision makers and becomes especially relevant at the annual Health Care Day discussions.

We have found storytelling to be a powerful tool to affect change in decision-making behaviour.

Participant satisfaction with the project has been extremely high, with turnover of Team members limited to those who have left employment with the RHA. Evaluation indicates that this can be attributed to the benefits the Team members experience through participation, the "way we are treated and feel valued," and the opportunities for useful networking.[4-6] Other essential elements in the Team's success include development of trust, the quality of relationships, adequate time commitment of partners, committed leadership, and genuine partnerships—mirroring previous literature on researcher/user interactions.[8-13] RHA CEOs and the Ministry of Health also attest to *The Need To Know* Team's role in creating a culture that promotes KT and evidence-based decision making provincially.[4-5] But have we found all the answers to KT?

Essential elements in the Team's success include development of trust, the quality of relationships, adequate time commitment of partners, committed leadership, and genuine partnerships.

The evaluation found that the first three years fostered *individual* capacity building, relationship building, and networking. But Team members also identified the need to develop strategies for capacity building at the *organizational* level to ensure sustainability. So in 2005, priority was given to RHA site visits to build regional organizational capacity beyond the Team members. The Team has also recently received CIHR funding to identify and address organizational challenges to KT in the RHAs. However, we continue to find it challenging to convince traditional peer review panels to fund a *process* rather than a *product*—the process of utilizing a strong team model with a proven track record to conduct research in response to future needs.

Conclusions and implications

We continue to find it challenging to convince traditional peer review panels to fund a process rather than a product.

The Need To Know Team story has captured the imagination of researchers and decision makers throughout Canada. The Team has become nationally recognized, with over 80 oral and poster presentations by various Team members. The evaluator (Sarah Bowen) has made important contributions to the development of KT theory,[6] and receives many cross-country requests for consultation. The Canadian Health Services Research Foundation (CHSRF) considers this initiative a best practice model for KT, and has funded workshops in Saskatchewan and Nova Scotia to discuss translating the model to other provinces. The director (Pat Martens) receives numerous invitations to discuss the Team model and its research, with groups such as CIHR's scientific directors and governing council, the University of Alberta, and CHSRF decision maker workshops. MCHP/*The Need To Know* Team also received the CIHR KT Award (Regional) for 2005. But the success of our KT initiative can best be summarized in the words of one RHA Team member, Sue Crockett:

> *"Although we work in different worlds, we can have a mutual relationship of respect. They can learn from us and we can learn from them. If we work together, we can produce amazing results—results that are meaningful, practical, and relevant."*

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ON THE ROCK, IN A HARD PLACE: CHALLENGES IN WORKING WITH ADVOCACY AND CARE PROVIDER GROUPS

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Researchers from the Memorial University of Newfoundland collaborated with a patient advocacy organization and the provincial cancer care provider on a study showing substantial variation in out-of-pocket costs for patients travelling to access cancer treatment. While the partnered research phase of the study proceeded smoothly, the successful dissemination of the findings—and the resulting government and media interest—created pressure for the provincial cancer care provider. They distanced themselves from the study and ended their role in what has proved to be an otherwise successful partnership.

Background

In the fall of 2001, the Canadian Cancer Society–Newfoundland and Labrador Division (CCS), a non-government patient advocacy organization, approached us to request a study of out-of-pocket costs for patients who travel to access cancer treatment. Anecdotal evidence suggests that these costs influence the decisions cancer patients make about their care.[1] The CCS had previously embarked on advocacy efforts on this issue, but the provincial Department of Health and Community Services had cited the need for more research.

CIHR, the Newfoundland and Labrador Centre for Applied Health Research, and the Canadian Breast Cancer Foundation–Atlantic Division funded the study, with data collection beginning in the fall of 2002. We surveyed 484 cancer patients, interviewed 21 cancer care providers, and gathered information about medical travel subsidy programs across Canada.

We found substantial variation in out-of-pocket costs for patients travelling to access cancer care. One-in-three rural patients (those living more than one hour away from a cancer clinic) paid more than $200 for travel and lodging during a single trip to an oncologist, with 9% incurring costs of more than $1,000 per trip. A significantly larger proportion of rural residents had higher costs than their urban counterparts and said that expenses for travel, drugs, and child care, and travel time, were important considerations in their care decisions.[2] Patients' cost-cutting strategies (including rationing medications, lengthening follow-up times, or choosing in-patient palliative care) may compromise quality of care. We recommended that the restrictive eligibility criteria of the provincial Medical Travel Assistance Program (the subsidy that reimburses patients for medical care-related travel costs) be reviewed, and that cancer care be provided in smaller communities wherever possible.

The primary audiences for our study were the CCS, the provincial cancer care provider—Newfoundland Cancer Treatment and Research Foundation (NCTRF), and the Department of Health and Community Services. We also wanted to communicate our findings to study participants, politicians, the public, cancer advocates and care providers in Canada, and other researchers.

The KT initiative

Our knowledge translation (KT) partners were the CCS and the NCTRF. The Department of Health and Community Services declined direct involvement in the study, but asked to be kept informed through ongoing interactions with the CCS and the NCTRF.

As researchers, our goal in engaging in KT activities was to provide rigorous, relevant, evidence-based recommendations that would improve the accessibility and quality of cancer care in the province. The goal of our partners, however, was to advocate for patients with high out-of-pocket costs, and especially to lobby for change to the provincial Medical Travel Assistance Program. This required careful definition of the roles of all partners throughout both the research and dissemination phases of the study.

The KT plan for the study included linkage and exchange activities and a multi-pronged dissemination strategy. The goal of our linkage and exchange activities was to identify relevant research questions, inform our partners of our progress, be responsive to changes in the decision-making environment, provide opportunities for our partners to contribute to the interpretation of findings and the development of recommendations and to continually discuss the roles of all partners.

To this end, we held a series of meetings with CCS and NCTRF staff to gain a better understanding of the research problem, the provincial cancer care system, and the partners' information needs. We also provided regular updates through email, telephone conversations, and in-person presentations. Both partners provided supporting documents and feedback on our research proposals, liaised with government to inform them the study was underway, and updated us on developments relevant to the study. The NCTRF assisted in recruiting study participants. Near the end of the research phase, we shared preliminary results and recommendations with the CCS and the NCTRF. An NCTRF administrator, with whom we had been closely collaborating, reviewed a near-final draft of the results and recommendations.

During the dissemination phase of the study, the CCS assumed responsibility for organizing the campaign to increase public awareness of the study findings and to lobby politicians and government officials. The NCTRF agreed to disseminate study findings to other cancer care agencies and to organize seminars with its own staff to identify changes in clinical practice. We were responsible for presenting the data (in summary documents and presentations), participating in interviews with the media, and meeting secondary dissemination goals, such as debriefing participants, sharing findings with researchers, and identifying collaborators for future projects.

In the spring of 2004, we (the researchers and CCS, in accordance with the roles described above) held a press conference to publicize the study findings; wrote a summary article for the CCS annual report (which was included as a supplement in community newspapers across the province); pursued media coverage; presented study results in non-technical language to community groups and Department of Health and Community Services officials; sent a two-page summary (written in non-technical language and highlighting actionable messages) to all members of the Newfoundland and Labrador House of Assembly and Department of Health and Community Services officials; and held face-to-face meetings with politicians as well as Department of Health and Community Services officials. The summary report was available on request and posted on the Division of Community Health's (Memorial University of Newfoundland) website.

Results of the KT experience

NCTRF initially shared the research findings with other care providers, but distanced itself from the study when the provincial government requested information about its support programs and delivery of care. In its response to government and in letters to local newspapers, NCTRF dismissed the study results and the partnership activities, and suggested that it had already addressed the issue of out-of-pocket costs. One letter to the editor noted that "Dr. Matthews' [sic] recommendations are neither new nor novel" and "it is important that researchers explore the current situation so that recommendations can be more meaningful and valuable."[3] NCTRF abandoned its plans to disseminate the study results to its staff.

Decision making and knowledge translation occur in a complex, dynamic environment where the partners' interest in, and perspective towards, the research findings, the researchers, and other partners continually evolve. The desire to use evidence in decision making competes with other organizational and personal motivations, not the least of which are self-preservation and self-promotion.

At the time of writing, CCS had garnered strong support for the need to change the Medical Travel Assistance Program, and we were invited to present the study to the caucus of the governing Progressive Conservative party. Our results were also used to support the introduction of tele-oncology programs (the evaluation of which includes an assessment of out-of-pocket travel costs). The nation-wide CCS network has brought together collaborators and researchers in other provinces and we are currently developing studies to examine other issues affecting access to cancer care in Canada.

Lessons learned

This experience taught us valuable lessons about KT in practice. Decision making and knowledge translation occur in a complex, dynamic environment where the partners' interest in, and perspective towards, the research findings, the researchers, and other partners continually evolve. The desire to use evidence in decision making competes with other organizational and personal motivations, not the least of which are self-preservation and self-promotion. Health system restructuring was looming in the fall of 2004, when it was widely expected that a new regional health authority would assume responsibility for cancer services from the NCTRF (and the NCTRF would no longer exist as a separate health board). Such an uncertain political climate would naturally motivate any administrator to demonstrate the value of their organization, as well as their administrative and political skills, to government decision makers.

Although organizations may be interested in realizing similar goals, there may be, nonetheless, an unwillingness to sacrifice other interests to do so.

The relationship between the CCS and the NCTRF had been difficult prior to this study: both organizations wanted to position themselves as the leader in cancer advocacy issues in the province. The pressure brought upon the NCTRF by the CCS's advocacy activities only heightened this tension. Although organizations may be interested in realizing similar goals, there may be, nonetheless, an unwillingness to sacrifice other interests to do so.

Our experience also highlights the potential vulnerability that KT can create for researchers, particularly junior academics. KT demands a substantial amount of time that could otherwise be used in activities that are more highly rewarded by promotion and tenure committees. Moreover, no researcher, particularly those early in their careers, can afford to have their professional credibility publicly questioned.

Conclusions and implications

Despite these challenges, we were able to develop and sustain a positive, mutually beneficial relationship with the CCS. A key element to this achievement has been the appreciation of each other's needs and cultures. The clear division and understanding of roles during the research and dissemination phases of the study allowed researchers to focus on academic activities and the CCS to strengthen its position as an advocate for cancer care. This linkage was further formalized when the principal investigator (Maria Mathews) was appointed to the CCS board of directors, providing an ongoing forum for us to learn about CCS's research needs, and for the CCS to learn about the potential use of research in its activities.

We thank Peter Dawe and Dr. John McGuire for their feedback on earlier drafts of this case.

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EXPLORING CULTURALLY RESPECTFUL CARE IN ABORIGINAL COMMUNITIES

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This project established a research and knowledge translation (KT) network between two Aboriginal communities, a health region and three tertiary educational institutions in Saskatchewan. The resulting coalition aimed to identify aspects of culturally respectful care that could ultimately be used to develop appropriate health care delivery systems and health professions educational programs for Aboriginal peoples. Relationship building between the coalition members took longer than originally anticipated, but resulted in important mutual learnings about Aboriginal ways of knowing, healing, and culture and has prepared the coalition to embark on a new phase of collaborative research.

Background

Indigenous peoples in Canada generally experience significantly lower health status than the rest of the Canadian population. They have differentially and increasingly been impacted by non-medical factors, such as socioeconomic status, education level, geography and cultural identity, leading to significant inequities in, and barriers to, achieving the health of individuals and communities.[1] Although the issue of health and health care for Aboriginal groups has been increasingly present on the national stage, these inequities persist.

This project, which established a research and KT network between non-traditional partners, was based on the belief that all people entering the health care system deserve to receive equitable and effective treatment in a culturally appropriate and respectful manner. For Indigenous peoples, culturally respectful environments acknowledge and, as appropriate, incorporate Indigenous knowledge. Examples of culturally respectful care include being inclusive of cultural health beliefs and practices in negotiating treatment options, and promoting a truly collaborative and mutual involvement of the health system and the community.

Our goal was to determine whether we could identify aspects of culturally respectful care that could ultimately be used to develop appropriate health care delivery systems and health professions educational programs for Aboriginal peoples. The project involved a coalition between two Aboriginal communities, the Regina Qu'Appelle Health Region (RQHR) in Saskatchewan, and three tertiary educational institutions. One Aboriginal community was a rural, non-treaty environment; the other, an urban, Métis community. Both were located within the RQHR. The three educational institutions, the First Nations University of Canada, the Saskatchewan Institute of Applied Science and Technology and the University of Saskatchewan, are all directly involved in the delivery of the Nursing Education Program of Saskatchewan, as well as a variety of other health services education programs which have involved the two Aboriginal communities.

The KT initiative

From its inception, the coalition emphasized the importance of relationship building for research, dissemination, and knowledge translation. We viewed KT according to the CIHR definition,[2] with an extra layer of understanding that recognized and adopted culturally appropriate and competent approaches.[3-5] We selected a community-based research method to build links between theory, practice, and policy.[6,7] We continually sought to relate research learnings to practice and policy applications and, of greatest importance, strove to be equally responsive to empirical and non-empirical evidence.

The coalition was initiated in late 2002, when three members of the research team recruited other colleagues and community members to formalize and submit a proposal to the Prairie Women's Health Centre of Excellence, which was supporting teams to prepare future funding proposals through seed grants.

The initial project phase aimed to identify appropriate ways to undertake research with Aboriginal communities. This preliminary relationship building and research planning allowed for team members to recognize and respect the equality of all voices in the process. Through the involvement of elders and Aboriginal community members, the group grew in its openness to the diversity of Aboriginal communities and knowledge. Awareness and agreement building strategies included community newsletters, stories/storytelling, workshops and sharing circles.

Early attempts to gain entry into the communities resulted in poorly constructed research strategies and general resistance from participants.

It was during this phase that the need for an Aboriginal advisory committee was identified. Early attempts to gain entry into the communities resulted in poorly constructed research strategies and general resistance from participants, who indicated that we were not including them or embracing Aboriginal knowledge in a respectful and meaningful way. This committee included individuals of varying educational, occupational, and community backgrounds (including both Métis and First Nations representatives), and provided direction and advice on general matters, such as potential partnering communities and strategies for building relationships. The committee also offered direction on specifics such as research methodology and appropriate KT strategies.

Each stage of involvement in the project was based on a negotiated and transparent approach to create a research environment that acknowledged and, as appropriate, incorporated Indigenous knowledge.

For the Aboriginal community partners, each stage of involvement in the project was based on a negotiated and transparent approach to create a research environment that acknowledged and, as appropriate, incorporated Indigenous knowledge. The inclusion of Aboriginal elders in advisory, facilitative, and interpretative roles was critical to achieving such an approach. Undergraduate and graduate Aboriginal students were also involved at all stages of the research process.

Results of the KT experience

The KT experience resulted in mutual learnings, the development of trust-based relationships, and new research directions. Although the team initially expected to be embarking directly on the main research questions—identifying aspects of culturally respectful care that could be used to develop appropriate health care service delivery systems and health professions education programs—we encountered many unanticipated issues associated with seeking information from the Aboriginal community about Aboriginal ways of knowing, healing and culture. We decided we needed more time for exploration and development in this critical area and pursued additional funding support. In the spring of 2003, the coalition received funding from an Indigenous Peoples Health Research Centre Partnership/Network Developmental Grant.

To date, the project has allowed us to draw out the preferred approaches of each Aboriginal community on the future directions for culturally respectful care and its relationship to health professions educational programs. While there were considerable differences between the two Aboriginal communities, the analysis of data from workshops and sharing circles revealed common themes relating to health, knowledge and spirituality in a holistic framework.

We have also measured the success of our KT activities by the intent of both Aboriginal communities to maintain and expand their relationships with the coalition. The coalition has also moved forward with research proposals on different areas of interest—one considering community building, the other articulating Aboriginal pathways to healthy living to inform how health services can be delivered in a culturally competent way.

Lessons learned

Gaining community trust

At the early stages of the project, Aboriginal community buy-in and trust were extremely low and these relationships required a large investment in time and commitment to affirm and build. Initially, the academic arm of the coalition entered the communities with research questions and approaches that were rooted in theory and experience in non-Aboriginal contexts. This yielded resounding criticism and rejection by the communities, which expressed feelings of under-involvement and disrespect. Rather than continuing with the researchers' agenda, the coalition had to reframe the project to adopt a more appropriate community agenda. The process also challenged the research team to be more inclusive of non-traditional partners at all stages of the project, and resulted in the formation of the Aboriginal advisory committee.

The advisory committee also helped us address the highly sensitive issue of consent—both at the community and individual level. They advised us of the sensitivities in Aboriginal communities around consent as "giving something away," and through their guidance, we were able to reconstruct consent as "having control over what happens to their knowledge."

Relevance

The partnering Aboriginal communities identified the development of research understanding and capacity as a priority. This focus was critical to informing and influencing policy processes by these communities, leading to buy-in and sustainability. For KT to be successful, the community of interest must see its relevance and utility.

Recognizing the diversity of Aboriginal communities

The two partnering communities had different needs and expectations of the projects. The urban community was more intent on community building and participation; the rural community on cultural competence in health care. However, as the project progressed, we were also able to share mutual findings between the two communities and identify areas of similarity.

Community champions

We quickly identified the need for a community champion as a link for knowledge translation in the Aboriginal communities. The elders, particularly through the Aboriginal advisory committee, were critical in mediating between the researchers and the communities and establishing credibility for the process.

Time constraints

Time and time constraints were major barriers in this process. The cycle for research funding creates an often unrealistic timeline for building trust, understanding, and mutuality in learnings and sharing in Aboriginal communities. A significant investment in time is required to be considered credible and collaborative in these environments: our coalition required at least two years to establish this foundation before we could consider entering the collaborative research phase.

Conclusions and implications

This is a continuing project, with the coalition now focusing on the learnings from the first phase of the project. The project has also expanded, bringing on new partners and collaborators outside of health care and post-secondary education, with new perspectives and contributions.

Our experience strongly indicates that there must be a cognizance of the cultural aspects to KT, which extend beyond just the Aboriginal context. In the current health care, health education, and health research environments, research teams cannot neglect or under-value multicultural aspects. This has major implications for the time frame for KT activities, the preferred KT strategies and appropriate dissemination of KT learnings. There are currently only limited tools for developing culturally appropriate KT strategies, and this creates a need for skills development, additional time and negotiation in the KT process.

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GUIDELINE DISSEMINATION THROUGH INTEGRATED CARE NETWORKS: LESSONS FROM ONTARIO'S BEST PRACTICE GUIDELINES FOR STROKE CARE

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As part of the Ontario Stroke Strategy, regional stroke coordinators were employed to disseminate best practice guidelines for stroke care to a province-wide network of service delivery organizations. In an evaluation of the effectiveness of the guideline dissemination strategy, researchers from the University of Toronto's Knowledge Translation Program identified a number of critical factors for success, including sufficient personnel, financial support for clinicians, local stroke champions and a supportive organizational climate. These and other lessons may guide provincial and national efforts to develop and promote best practice guidelines for integrated care.

Background

The Ontario Stroke Strategy (OSS) aims to decrease the number of strokes and improve the care of people with strokes, through the creation of a province-wide, integrated, and comprehensive system of stroke care. The OSS led to the creation of regional and district stroke centres across the province as sites of expertise and leadership, the hiring of regional and district stroke coordinators to support and implement the OSS and the development and dissemination of nineteen best practice guidelines for stroke care.

The guidelines, published in 2003, were developed through a partnership between the Heart and Stroke Foundation of Ontario (HSFO) and the regional stroke centres. They address all levels of stroke care including: stroke prevention and recognition; pre-hospital, emergency, and acute care; transition management; rehabilitation; and community re-engagement. Stroke coordinators, including education coordinators, became champions of the best practice guidelines and were responsible for their dissemination to all health care providers and stakeholders engaged in the continuum of stroke care in their jurisdictions.

While research findings were used to both develop the guidelines and design strategies for their dissemination, the effectiveness of guideline dissemination across integrated networks of care has not previously been studied. In June 2004, HSFO contracted us, as researchers from the Knowledge Translation Program at the University of Toronto, to examine the process of guideline dissemination and, in particular, the stroke coordinators' experiences and their perceptions of the effectiveness of the HSFO guideline dissemination strategy.

The KT initiative

The guidelines were formally launched by the HSFO through a dissemination workshop in Toronto in June 2004. The workshop was designed to facilitate understanding of the guidelines and to model dissemination methods for stroke coordinators, who would tailor them to particular needs in their jurisdictions. To assist local dissemination and uptake, HSFO developed printed and electronic versions of the guidelines, a video, a slide presentation, posters, pamphlets, evidence-based summaries, and other materials.

We distributed surveys to the stroke coordinators who participated in the workshop, and conducted follow-up in-depth telephone interviews approximately one month after dissemination of the guidelines into their local jurisdictions. The interviews focused on the stroke coordinators' local dissemination strategies, their perceptions of the effectiveness of the dissemination of the guidelines in influencing the practices of health care professionals in their jurisdictions and their overall perspectives on HSFO's dissemination process.

Results of the KT initiative

Half of the 38 workshop participants returned surveys and 18 telephone interviews were conducted. Some coordinators had been involved in the development of the guidelines, while others were new in their positions and first learned about the guidelines at the workshop.

We identified a number of goals and processes that were common across the stroke coordinators' local dissemination strategies. These included:

- **Investing time in developing relationships** with administrators, managers, and front line practitioners to secure their buy-in and set the stage for future changes;
- **Conducting needs assessments**, both formal and informal, to identify the gaps and needs of various stakeholders;
- **Increasing awareness and knowledge of the guidelines** by organizing lectures, workshops, and promoting HSFO educational resources such as pamphlets, posters and online learning modules; and
- **Promoting practice changes** through strengthening collaborations, supporting progress, and providing tools, such as assessments and checklists, to carry out the guidelines.

The coordinators also identified factors that they perceived to be critical to the promotion and implementation of the guidelines:

- **Funded personnel**, including their own positions as regional and district stroke coordinators and regional education coordinators, and administrative support and education facilitators, were instrumental to guideline dissemination given the extensive time and effort required to plan, organize, implement, and follow-up. Staffing levels of stroke programs must also be sufficient for front line practitioners to implement the guidelines.
- **Local stroke champions** were seen as strategically placed people with a concern about stroke care and decision-making capabilities that could generate buy-in from their organizations and provide venues for changes. Local stroke champions were valuable members of stroke committees.
- **A critical mass of human and administrative resources** supported optimal stroke care. Those organizations perceived to have the least difficulty implementing the guidelines were those with a broad range of stroke services, strong administrative and physician support, clinicians who were already committed to best practice, and dedicated and effective stroke champions. Coordinators located in rural areas or smaller community hospitals faced the challenge of applying the guidelines in contexts where there are not large concentrations of stroke patients or professionals with expertise in stroke care.
- **The Ontario Stroke Network**, or more specifically, the formal and informal communication between the stroke network and education coordinators across the province, was seen as instrumental to guideline dissemination activities. Members of the network shared resources and frequently consulted each other.

The formal and informal communication between the stroke network and education coordinators across the province, was instrumental to guideline dissemination activities.

While the coordinators felt that there were positive outcomes from their dissemination and promotion of the uptake of the guidelines, the following issues were identified as impeding their efforts:

> *Our findings also highlighted the incapacity of health service providers to comply with the guidelines when working within organizations that did not support their learning and practice changes.*

- **Organizational barriers** included insufficient commitment from senior administration, staff turnover and shortages, work overload, lack of financial support for employee training and lack of dedicated time to make and sustain practice changes. These were particular concerns of coordinators who worked in jurisdictions with few or widely dispersed stroke patients and experts, and in rehabilitation programs, long-term care, and Community Care Access Centres.
- **Geographical and organizational reach**. The coordinators described significant challenges in reaching all stakeholders, due to large geographical areas and the number of stakeholders involved.
- **Evaluation processes and tools**. Many coordinators were concerned there had been insufficient emphasis placed on the measurement of outcomes resulting from the dissemination of the guidelines. Some indicated that patient outcome data would promote stakeholder buy-in, particularly by physicians and administration, and provide direction for future interventions.
- **Resistance to change**. Some coordinators saw the lack of a mandated organizational commitment to the overall OSS as a barrier to the promotion of the guidelines. There were also instances of resistance to change because of disagreements about the evidence. Some viewed strained relations between provider organizations and employed professionals, and general feelings of being overwhelmed by changes in health care, as underlying causes of resistance to uptake and implementation of the guidelines.

> *The strengths and weaknesses of the guideline dissemination strategy provide insight into methods for translating clinical evidence into practice with different targets, settings and organizational structures, as well as across inter-organizational management structures.*

Our evaluation suggests that the methods used to disseminate the guidelines were consistent with available research evidence in knowledge translation (KT). The coordinators met face-to-face with key stakeholders to introduce the guidelines, negotiate their meaning and implications for particular professions and organizations, and to encourage buy-in and support.[1] They then adapted dissemination strategies and educational interventions to identified needs and contexts.[2] The coordinators also cultivated local champions and opinion leaders to optimize guideline uptake and practice change, although questions about the roles of opinions leaders in KT are unresolved in the research literature.[3,4] Our findings also highlighted the incapacity of health service providers to comply with the guidelines when working within organizations that did not support their learning and practice changes, as well as the challenges of overcoming conflicting opinions about the evidence and a general resistance to change.[5,6]

Lessons learned

The strengths and weaknesses of the guideline dissemination strategy provide insight into methods for translating clinical evidence into practice with different targets, settings and organizational structures, as well as across inter-organizational management structures. We hope that they may guide other provincial and national efforts to develop and promote best practice guidelines for integrated care.

Greater emphasis should be placed on engaging organizational decision makers in guideline development, dissemination, implementation and evaluation.

- Sufficient complements of clinical, educational and administrative personnel, as well as financial support for clinicians' continued education, are necessary for guidelines to be learned, adopted and implemented into health care providers' clinical practices.
- Comprehensive strategies to evaluate the effectiveness of guideline dissemination are needed. While this study focused on participants' evaluations of the effectiveness of the dissemination process, objective measures of changes in provider behaviours and patient outcomes are also required.
- Alternative methods may be needed to promote guidelines for continuing care and to engage Community Care Access Centres and long-term care facilities in guideline adoption and implementation.
- Additional supports may be needed to reach rural and remote regions, and community hospitals.
- Greater emphasis should be placed on engaging organizational decision makers in guideline development, dissemination, implementation and evaluation to ensure that sufficient human and material resources are in place to support positive practice changes and improved patient outcomes.

Conclusions and implications

HSFO is involved in ongoing guideline implementation and evaluation initiatives, building upon the findings from this and other studies. For example, the guidelines have been integrated into the Multidisciplinary Learning Objectives for Stroke, which identify knowledge, skills, and values for health professionals working with stroke survivors across the continuum. A pilot project is underway to develop a guide on proven strategies for implementing the objectives across varied clinical settings. Recent developments for a Canadian Stroke Strategy (CSS) have prompted a National Best Practices, Standards and Guidelines Working Group, as well as a National Evaluation Strategy. Evaluations of the OSS and CSS will involve ongoing measuring and monitoring of performance indicators that reflect quality of care provided and/or patient outcomes identified in best practice guidelines.

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CANCHILD CENTRE FOR CHILDHOOD DISABILITY RESEARCH

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CanChild Centre for Childhood Disability Research works in close partnership with policy makers, service providers, parents and youth to identify emerging issues in childhood disability, and translate research knowledge into practice improvements. With an emphasis on involving partners throughout the research and knowledge translation (KT) process, CanChild's activities have resulted in significant improvements to the services provided to, and the outcomes of, children with disabilities and their families. CanChild's success can be attributed in part to its long-term relationships with diverse target audiences, which allow for ongoing development, evaluation and refinement of effective KT approaches.

Background

One Canadian family in five is raising a child with a significant emotional, behavioural, or developmental disability. These disabilities present special challenges for children and families, and for virtually every community in this country. *CanChild* Centre for Childhood Disability Research* at McMaster University is dedicated to the study of these issues and takes a leadership role in identifying questions for research, practice, policy and education, and effectively translating knowledge into practice at clinical and health system levels.

The Ontario Ministry of Health and Long-Term Care has funded *CanChild* as a health system-linked research unit since 1989. We work in close partnership with the Ontario Ministry of Children and Youth Services, the Ontario Association of Children's Rehabilitation Services (OACRS), and several parent organizations. Partnerships with parents and families are the driving force of much of our work, and parents of children with disabilities have been co-investigators on *CanChild* research studies.

The KT initiative

CanChild has a KT committee that is responsible for the development and implementation of our KT strategy, and employs a full-time KT coordinator to oversee KT activities. Our advisory board, which is comprised of representatives from community agencies, families, McMaster University, and OACRS, provides advice on *CanChild's* research, KT, educational and fund-raising activities. *CanChild's* KT and research activities are also informed by parents and service providers who have initiated specific research projects in partnership with *CanChild* investigators, and who read and provide input on our materials to ensure their relevance to our target audiences.

The production and dissemination of written materials is one of *CanChild's* primary KT strategies. In the early 1990s, we recognized that traditional academic methods of dissemination were largely ineffective for making research accessible to busy service providers, parents and policy makers. At that point, our KT committee sought new ways to share information and we began to develop concise and targeted written materials, such as fact sheets and plain language summaries of research findings.

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* For more information, visit www.fhs.mcmaster.ca/canchild.

Our award-winning website, developed in the mid-1990s, is one avenue through which we have increased the accessibility and impact of our evidence-based written materials. More recently, we developed an intranet that enables service providers and researchers across Canada with common interests in childhood disability to share ideas and resources.

Our early KT activities included face-to-face visits with each children's centre to learn about their burning issues first-hand and to identify a local research champion to help broker our information to the relevant audiences. We also instituted a "clinical relief program" that targeted two barriers to research involvement identified by service providers—lack of time and research expertise. This program provided seed money to clinicians to give them protected time to pursue research with methodological consultation from *CanChild*. Evaluation of this program showed that a small investment of time, money and expertise can have a significant impact on research involvement, productivity and practice change.

Small investment of time, money and expertise can have a significant impact on research involvement, productivity and practice change.

Results of the KT experience

The following are examples of *CanChild's* research partnerships and KT activities.

1. Defining and building awareness of family-centred service

Family-centred service (FCS) is both a philosophy and an approach to providing services to children with disabilities and their families that puts the family at the centre of decision making. *CanChild* has been instrumental in facilitating the use of this approach in children's rehabilitation services across Ontario.

Our work in this area was prompted by a request from our OACRS partners in the early 1990s, when FCS was an emerging and somewhat ill-defined concept unfamiliar to most service providers. We began by creating a framework and, in collaboration with parents, developed and validated a measure to explore their perceptions and experiences of FCS. Companion measures were also developed to assess service providers' reports of FCS behaviours, and parent and service provider beliefs.

We have been able to document the significant relationships between FCS and parent satisfaction, stress and mental health, and have provided feedback to each OACRS program about their progress in creating a family-centred environment. In further collaboration with parents, we developed and evaluated consumer-friendly fact sheets about FCS which have been posted on *CanChild's* website to enhance national and international access to this knowledge.

2. Developing gold-standard motor skills measurement materials

The documentation and evaluation of interventions for children with cerebral palsy has been severely hampered by the lack of reliable, valid, and responsive measures of outcomes. Our partnerships with service providers enabled us to develop and validate outcome measures that are now the gold standard among clinicians and researchers worldwide. These tools provide rehabilitation professionals with the means to systematically evaluate interventions. The tools also provide the information they need to talk knowledgeably with families about children's motor skills, appropriate goal setting and prognosis for motor development. *CanChild's* clinical partners were actively involved in this process by identifying important clinical questions, participating in the development and validation of the measures, engaging children and families to enable the systematic collection of data, and working with us to interpret the findings.

Clinical partners have also challenged us to develop materials that are useful to them in everyday practice. In response, we have developed resources in a variety of user-friendly formats, including videotapes, self-instructional CD-ROMs, computerized tutorials and scoring systems, face-to-face workshops, focus groups, and a variety of web-based resources. We are currently working with our partners to evaluate the effectiveness of knowledge brokers to facilitate change in clinical practice, using our motor skills measurement materials as specific examples.

3. Collaboration with target audiences enhances research and KT
CanChild responded to parents of children with Developmental Coordination Disorder (DCD) who were frustrated about seeking help from many different health service providers. A series of research studies resulted, focusing on the early identification of the disorder, education for service providers, modification of existing clinical practices, health promotion, and models of KT designed to empower parents to be advocates for their children.

In each instance, research evidence was summarized and then translated into flyers, booklets and websites specific to, and developed with, each target audience, including parents, therapists, physicians and educators. The first information booklet about DCD was requested by over 8,000 families worldwide before being posted on our website in four languages. Workshops developed with parents will soon be available to parents anywhere in North America through web-conferencing, and academic detailing is being used to transmit knowledge about DCD to physicians. KT to such varied audiences has contributed to increased recognition, and earlier identification and intervention for children with DCD.

In addition to listening to parents, we value the perspective of the clients themselves. In response to feedback from adolescents, we developed web-based questionnaires to allow youth to participate in our research projects independently, using their own computer-adapted technology. In addition, the new Youth KIT (a tool for giving, getting, and organizing information) has been developed with youth with disabilities and uses varied media to accommodate different user styles. The Youth KIT is revolutionizing the way youth prepare for transition to adult health care and social services.

Lessons learned

Develop strong partnerships and involve target audiences

We have recognized the value of partnerships between people with technical skills in research and people with experience of the issues being studied. By involving service providers and families in research studies we have been able to provide training and education, and foster interest and enthusiasm for the results. In turn, our partners provide input that facilitates interpretation of findings and implications for practice.

Express knowledge and ideas using plain language

CanChild documents are typically written using plain language that is easily understood by a range of target audiences. This allows for the development of one version of a report that includes specific recommendations for multiple target audiences, informing each group about how the research relates to them and to other groups with whom they work.

Evaluate KT approaches

We have systematically evaluated our KT activities using Buxton and Haney's payback model, which provides a framework to document research outputs, applications, and outcomes,[1] and through impact surveys completed by our partners. These findings have been used to refine our KT methods and have demonstrated that *CanChild's* activities are significantly improving the content and style of services to, and outcomes of, children with disabilities and their families.

Secure infrastructure funding

CanChild's original multi-year funding enabled the development of strong, mutually beneficial partnerships and a systematic program of research. We continue to receive infrastructure funding that promotes the development of new ideas and provides support for our KT activities, but our current single-year funding makes long-term planning more challenging than in the past.

Conclusions and implications

CanChild is seen as a model of research partnerships around the world and has spawned a similar centre in the Netherlands. The long-term relationships between our partners have fostered our research and KT, and have allowed us to tailor both to meet the evolving needs of our target audiences. These activities go beyond "just doing the research" and have been essential to the impact that our research has on the lives of children with disabilities and their families.

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EXPANDING ESTABLISHED KNOWLEDGE TRANSLATION NETWORKS TO RESPOND TO A COMMUNITY IN DISTRESS

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In the wake of the devastating 2004 tsunami, a group of concerned scientists, physicians and community leaders formed a local distress relief network to provide information, referral, and care to the affected Toronto Tamil community. This initiative was made possible by a previous community-based survey of Tamil mental health needs, which produced both valuable findings and, more importantly, resulted in a respectful and enduring university-community partnership. In a time of crisis, these established knowledge translation (KT) networks enabled the rapid development of activities to promote knowledge exchange on culturally appropriate service provision, provider-community networking, and mutual aid among service providers.

Background

The tsunami of December 26, 2004 was a catastrophe for countries rimming the Indian Ocean. It also had a devastating impact on people from affected communities living elsewhere in the world. Not one of the 160,000 Sri Lankan Tamils living in Toronto, watching and listening to the news and worrying about friends and family in their home country, was left untouched.

Over the last few decades, Toronto has become home to the largest Tamil diaspora in the world. Toronto Tamils form a well-educated and civic-minded newcomer community. Often arriving as asylum seekers, most have become Canadian citizens and are enjoying some degree of economic well-being in Canada. However, as is often the case with immigrants and refugees, many Tamils are separated from immediate and extended family for long periods of time, face under-employment and lower than average household incomes, and experience language barriers that hinder their employment prospects and access to public services. Members of the community are also still dealing with the effects of displacement and exposure to traumatic events in Sri Lanka during the country's twenty-year civil war.

This case describes a joint academic-community effort to provide psychosocial support to Toronto's Tamil community in the wake of the tsunami. Our initiative was made possible by a recently completed mental health study with the community. The findings from the study, and the existing university-community research partnership, provided the foundation for effective knowledge exchange, sharing of respective expertise and resources and increased public awareness of local mental health needs at a time of heightened need. The initiative, the Local Distress Relief Network (LDRN), provides an example of effective KT and community empowerment, and contributes to the development of policy and practice guidelines for culturally appropriate health-related interventions with ethnocultural communities in Canada.

The KT initiative

The original mental health study, entitled "A Community in Distress," was initiated when Tamil community leaders, concerned about mental health in their community, approached Dr. Morton Beiser to join with them in an effort to document mental health problems, associated risks, protective factors, help-seeking patterns and perceptions of health care. The epidemiological survey of 1,600 adult Tamils between 2000 and 2004 was planned and overseen by an executive group that included university researchers and Tamil community leaders, and supported by CIHR funding.

The findings from this study meant that when the tsunami hit, we already knew that 12% of the Tamil population was suffering from post-traumatic stress disorder (PTSD)—a rate not unusual for refugees, but considerably higher than for the general population. We also knew that mental health services in Toronto were insufficient and rarely culturally appropriate. Only one-in-ten Tamils with PTSD had received any form of support.[1] How could people who had already experienced so much trauma cope with this new tragedy? Could anything be done to prevent re-traumatization?

Jointly initiated and led by Drs. Anneke Rummens and Laura Simich, a group of concerned scientists, physicians, Tamil community leaders, scholars, and service providers formed an informal network of individuals to focus collective efforts on what we called local “distress relief.” The network aimed to offer a much-needed forum for information exchange on culturally appropriate service provision, provider-community networking, professional referrals, and mutual aid among service providers in Toronto. The foundation of the network was the partnership between university-based academics and representatives from the many Tamil service organizations that formed the core of the mental health study’s community advisory group.

Once launched, the LDRN expanded rapidly. The first face-to-face meeting drew nearly 50 people from diverse sectors, including community health centres, hospitals, public schools, Tamil and multi-ethnic community-based organizations, municipal public health offices, and academia. Bracketing these collective relief efforts, the research team sponsored forums for community members and service providers during which they presented initial findings from the survey of Tamil mental health.

KT was effective because it was community-based and driven by the articulated needs of the community itself, with health researchers and professionals playing a supporting role.

In its first five months, LDRN activities included several collaborative efforts that reached across different sectors. First, we prepared, translated and distributed culturally appropriate mental health promotion materials at an important community vigil, through local service organizations and via the Internet. In collaboration with the Settlement Workers in Schools program, a carefully-prepared letter was directly distributed to teachers in elementary schools with large Tamil student bodies to inform them about the community’s concerns and responses to the disaster. Citizenship and Immigration Canada provided $50,000 for Tamil translation and distribution of 5,000 photo-novellas on PTSD and depression previously available only in Canada’s two official languages.

In addition, the CIHR Institute of Health Services and Policy Research provided workshop funding to bring together international trauma and mental health experts, Toronto Tamil health and settlement service providers and physicians, and public health agency officials. This group of experts discussed the current international mental health debate over the role of trauma counselling in community-based, culturally appropriate distress relief, and reached consensus on its implications for health policy and practice in Canada. Workshop participant Dr. Jack Saul, founding director of the International Trauma Studies Program at New York University, remarked that the LDRN workshop was one of the most outstanding examples of community-based response to trauma he has ever witnessed.

Results of the KT experience

The network significantly increased the level of information exchange and mutual support among its members. KT was effective because it was community-based and driven by the articulated needs of the community itself, with health researchers and professionals playing a supporting role. The mandate and activities of the network also informed the tsunami response of several other organizations, including university departments and municipal emergency response units.

The LDRN's school-based initiatives were particularly critical and appreciated. The new photonovellas have not yet been evaluated, but they are likely to be a welcome resource because so little mental health literature is available in translation. Proceedings of the expert workshop, containing policy, practice and research recommendations, are currently being prepared for dissemination.

It is too early to tell if there will be systemic infrastructural changes in terms of hospital services or government policies. We recognize that it will take more time to engage wider institutional support in order to ensure that mainstream institutions become more responsive to diverse communities during crisis situations, and also more generally.

Looking ahead, a small working group of mental health professionals from the network have begun to find ways to support Tamil community-based service providers in the long term. They are hoping to develop collaborative funding proposals for more sustained mental health services for Tamils in Toronto. Other members are focused on community and/or institutional capacity building. Several have also become involved in information exchanges and planning for increased mental health worker training in Sri Lanka.

Lessons learned

Our original mental health study had, from the outset, created mechanisms to ensure the translation of research knowledge to community members and service providers. The LDRN accomplished its objectives because we were able to rely on those established working relationships.

We did not, however, expect to be taking part in responding to an emergency and there were some disadvantages to a lack of advance planning. As is the case for much KT work, there was very little institutional infrastructure to draw upon. Without dedicated administrative or substantial institutional support, we relied extensively on volunteered personal time and virtual networking and were profoundly grateful for the moral and practical support provided from the departments of Psychiatry and Public Health Sciences at the University of Toronto.

A key challenge faced by the network was identifying community-based Tamil service providers who had the resources to respond to public inquiries that might result from distribution of health promotion leaflets. This again speaks directly to the need for infrastructural support mechanisms—including skilled personnel—for such outreach initiatives.

Conclusions and implications

This case study demonstrates the importance of making the relationships underlying KT a regular part of research, and shows their power to enhance health system responsiveness and to meet both identified and unanticipated health needs. The LDRN helped shape an effective and rapid response to the tragedy, may have helped alleviate individual psychological suffering and created new possibilities for ongoing KT to address public health needs.

According to Raymond Chung, executive director of Hong Fook Mental Health Services, “There is no one formula for working with all immigrant communities, but there is a need to grow alongside the community.” The development of the LDRN demonstrates the potential of partnerships with transnational immigrant communities in healing, rebuilding, and providing sustainable health care for under-serviced ethnocultural communities. Increasingly, learning to put research to good use requires increased awareness of the importance of global ties both for diaspora communities and for Canada itself.

However, one KT barrier remains: identifying additional partners in the public policy sector. Despite Canada’s much-vaunted commitment to multiculturalism, there are few places in government where health and cultural diversity intersect. In this particular case, the researchers’ connections with community members and service providers were much stronger than that with policy makers. For systemic changes to occur, decision makers from other sectors will need to be involved in future initiatives.

The LDRN helped shape an effective and rapid response to the tragedy, may have helped alleviate individual psychological suffering and created new possibilities for ongoing KT.

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A MULTIDISCIPLINARY, MULTI-SECTORAL ALLIANCE TO IMPROVE DRUG USE IN NOVA SCOTIA

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The Drug Evaluation Alliance of Nova Scotia (DEANS) is a multi-sector initiative designed to encourage appropriate drug use by influencing behaviour change. DEANS involves researchers, students, adult educators, health care professionals, decision makers and program administrators in developing multi-faceted, evidence-based educational interventions. The initiative delivers cost effective and cost-saving research: one project played a key role in policy changes worth millions of dollars in savings to the province. DEANS attributes its success to the multi-sector synergy created through the partnerships, and involving researchers who have protected time for rigorous evaluations.

Background

Publicly funded drug programs frequently use policy levers, such as selection of drugs for public reimbursement and payment rules, to encourage or discourage drug utilization.[1] While such levers incorporate available evidence and generally manage costs, they have a limited effect on changing attitudes and behaviours among health professionals and patients.

In 1998, the Nova Scotia Department of Health established the Drug Evaluation Alliance of Nova Scotia (DEANS),[*] with a mission to contribute to the health of Nova Scotians by encouraging appropriate drug use. DEANS was funded to identify critical drug care issues; obtain and analyze information and data relevant to these issues; develop interventions to provide targeted, evidence-based information to health care providers and patients; and to evaluate the impact of initiatives on drug utilization, health professional behaviour and patient outcomes. The Pharmacare Formulary Management Committee reviews drugs for listing in the Pharmacare benefit list, with DEANS operating in concert to provide educational interventions to strengthen policy initiatives.

The KT initiative

DEANS is coordinated by a management committee which includes individuals with expertise in continuing education, family medicine, clinical pharmacy practice, epidemiology, and drug utilization and evaluation. The committee meets monthly to discuss knowledge synthesis and intervention projects, learn of relevant education programs, facilitate information sharing and to build trust among participants.

DEANS develops multi-faceted interventions based on the research literature and local data as well as the knowledge and experience of committee members. The interventions, which include web-based and didactic educational programs, academic detailing, prescribing profiles and pharmacist reflection and feedback, facilitate uptake of evidence by health professionals and patients. Educational initiatives for practicing clinicians are provided

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[*] For more information about DEANS, visit http://www.gov.ns.ca/health/pharmacare/deans.htm.

through education programs at Dalhousie University or through professional groups, which are viewed as independent, credible sources (in contrast to initiatives provided by government, which can be perceived as mere cost-cutting measures).

At a typical committee meeting, there are academic researchers, drug evaluation experts, health professional adult educators, health care professionals, decision makers and program administrators. Dalhousie University trainees, drug use management and policy residents, undergraduate and graduate students and research fellows also work closely with DEANS.

Results of the KT experience

Three examples of knowledge translation (KT) activities developed by DEANS are provided.

1. Preceding policy change with educational interventions
In 1999, over 700 Nova Scotia seniors were receiving chlorpropamide to treat diabetes, a drug which carries an increased risk of hypoglycaemia in elderly diabetes patients, and which has been widely identified as inappropriate for seniors.[2] In late 2000, the Nova Scotia Seniors' Pharmacare Program and the local teaching hospital advised health care professionals and patients that they would remove chlorpropamide as a formulary benefit by June 2001.

DEANS preceded this change by coordinating a broad-based educational intervention to help patients and prescribers convert to different drugs. Adult educators, endocrinologists, family physicians, pharmacists, and educators with the Diabetes Care Program of Nova Scotia were involved. A patient brochure was developed to explain the reasons for change. Physicians were sent a personalized list of their Pharmacare patients receiving chlorpropamide, chart reminders, patient instruction sheets, information on continuing medical education programs, and a one-page recommended approach to selecting drug alternatives. An endocrinologist was also available to discuss difficult switches with physicians.

All Nova Scotia Pharmacare seniors were successfully switched to more appropriate therapy within 12 months.[3]

2. Partnering across the continuum of care to aid a significant policy change
In 1999, over 5,000 beneficiaries of the Nova Scotia Seniors' Pharmacare Program were receiving respiratory medications to treat lung disease (e.g. asthma, emphysema) by nebulization (by mask). A drug evaluation completed by the Formulary Management Committee concluded that portable inhalers have comparable efficacy, less chance of contamination, and are more convenient and less costly than nebulization.

In 2000, the Nova Scotia Seniors' Pharmacare Program announced that they would limit payment of respiratory medications delivered by wet nebulization to specific patients in six months time, and would immediately add a spacer device to help patients use portable inhalers better. The program also established a professional fee to reimburse pharmacists for providing education on the proper use of the spacer device.

To accompany the policy change, DEANS coordinated multi-faceted educational interventions targeting physicians, hospital and continuing care staff, pharmacists, respiratory technologists and patients to help them manage the transition. Interventions included continuing education programs and support from other provincial partners such as the Nova Scotia Lung Association, which provided a toll-free, 24-hour support line for patients and health professionals.

Many patients were able to switch to portable inhalers, resulting in an estimated drug cost saving of $1 million per year. In October and November 1999, 12% of patients used only wet nebulization; this dropped to 4% in

October and November, 2000. This change was not associated with any untoward effects, such as increases in physician visits or hospitalizations.[4-9]

3. Physician profiling to effect practice change
Physician profiling—providing information on a physician's past patient care activities to influence future decisions—is one tool used to promote change in physician behaviour, but evidence of its effectiveness is conflicting. In 2001, DEANS initiated a project to determine if physician profiling could alter prescribing patterns for topical corticosteroids for skin diseases. A therapeutic class review completed by the Formulary Management Committee had previously identified that mild to moderate topical corticosteroids are preferred in the elderly, and that prices vary greatly between products in the same potency category.

DEANS developed individual-level physician profiles that aimed to convey two main messages to prescribers: the potency of the products being prescribed, and the different costs of the products being prescribed within potency classes. These profiles, and an accompanying cost comparison chart, were mailed to prescribing physicians. The physicians were re-profiled and new profiles were sent the following year. However, the project did not result in any significant difference in prescribing patterns.[10]

Lessons learned

Preceding such a policy change with multi-faceted educational interventions provided both health care professionals and patients with sufficient knowledge to adapt to the change.

These examples offer a number of important lessons for future KT initiatives.

First, a policy change such as delisting a formulary drug will impact prescribing patterns. But preceding such a policy change with multi-faceted educational interventions provided both health care professionals and patients with sufficient knowledge to adapt to the change, which generally occurred before the new policy came into effect. We attribute part of our success to utilizing practitioners' usual sources of information as vehicles for KT such as newsletters from Doctors Nova Scotia, the Pharmacy Association of Nova Scotia, and the Capital District Health Authority.

In our second example, participation across the continuum of care, with direct involvement of several types of health care professionals and a health charity, helped to implement a significant policy change with no evident ill effects. The incorporation of a financial incentive for pharmacists to provide an educational service was viewed as important. A qualitative evaluation noted:

> *"Paying attention to questions at both the broadest possible level (the provincial Pharmacare system) and narrow levels (individual attitudes and behaviours in practice) strengthened this initiative. Policy initiatives that incorporate and reflect research evidence address an important barrier to change, but evidence alone is unlikely to promote change."*[11]

In our third example, mailing physicians unsolicited profiles and prescribing recommendations was ineffective in changing their prescribing behaviour. Other evidence suggests that providing this kind of information in isolation does not typically motivate physicians to change, and that multiple strategies may be required. Physician profiling may be more effective if it is incorporated into educational outreach programs where individual approaches could help to effect change.[10,12] We also identified other contributing factors, such as the high safety profiles and low prescribing rates for these drugs, meaning that they are not necessarily recognized as a high priority for practice change.

Physician profiling may be more effective if it is incorporated into educational outreach programs where individual approaches could help to effect change.

As a general lesson, we have found that trainees play a key role in DEANS. As part of their academic programs, they produce various knowledge products, such as reviews of theory, systematic literature reviews, methods development, surveys of other jurisdictions, identification of "smart practices," and qualitative and quantitative evaluations of interventions. By nature, trainees are focused on theories and strengthening methodology, activities that are not necessarily funded with high priority in policy making. Yet a student can spend a year developing a rigorous evaluation method of great value to the Pharmacare programs, at a cost borne entirely by the university or granting agencies. As well, the trainees benefit enormously from their involvement in DEANS by participating in the KT process, experiencing real life challenges of knowledge dissemination and uptake, and learning the language of decision makers.

Conclusions and implications

In DEANS, decision makers, practitioners and researchers are working together to improve drug prescribing and use. Each partner brings resources, knowledge, skills and experience, creating a multi-sectoral synergy that we believe forms the basis for our success. Researchers and students are funded through CIHR, the Canadian Health Services Research Foundation, other granting agencies, and the university, which allows for the time, resources, and skills to do rigorous evaluations. This work is valued by the policy maker community, and as evidenced by the nebulization policy change, can save the government millions of dollars.

Trainees benefit enormously from their involvement in DEANS by participating in the KT process, experiencing real life challenges of knowledge dissemination and uptake, and learning the language of decision makers.

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USING AN AMBASSADOR PROGRAM TO IMPROVE THE MANAGEMENT OF CHRONIC PAIN

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An ambassador program focusing on improving the quality of pain management was introduced in Alberta. In a partnership between researchers, senior clinicians and government officials, research and clinical leaders presented evidence on chronic pain interventions to local clinicians through community workshops. Participants reported an increase in knowledge, knowledge sharing and practice changes as a result. The ambassador program holds promise as a knowledge translation (KT) approach, but would best serve the needs of clinicians as an ongoing professional education service.

Background

As early as the 1970s, leading pain management researchers remarked that if we used currently available knowledge to guide clinical practice, more than 90% of uncontrolled pain would be managed successfully. Thirty years later, surveys of patients hospitalized for surgery, cancer patients, and those with chronic pain continue to indicate that we are far from achieving that goal.

The slow progress in improving the quality of pain management contrasts sharply with the explosion of relevant research and the publication of practice guidelines for numerous clinical pain dilemmas. Challenges remain in the consistent and comprehensive assessment of pain; the use of validated treatments; the availability of adequately trained health care professionals; and budget provisions for space, equipment, personnel, medications, and pain treatment facilities.

Our KT strategy was inspired by the work of the Swedish Council on Technology Assessment in Health Care (SBU). SBU conducts scientific assessments in health care to identify the interventions that offer the greatest benefit for patients and the most efficient utilization of resources. In the mid-1990s, SBU developed an ambassador program, where senior clinicians were hired to be liaisons between SBU and the decision makers and clinicians in each health district. The senior clinicians conducted workshops, clinical rounds, and conferences, and met with clinicians and policy makers to inform them of the latest results from SBU health technology assessments (HTAs). The ambassadors also informed SBU of local priorities that could be considered for future HTAs.

We adapted the Swedish ambassador program to the Alberta context with an initial focus on management of chronic, non-cancer pain.

The KT initiative

Our project built on established relationships among researchers from the Health Technology Assessment Unit of the Alberta Heritage Foundation for Medical Research (AHFMR), senior clinicians from the University of Calgary and University of Alberta and senior government officials from Alberta Health and Wellness. As a group, we have been involved in developing priorities for HTAs related to chronic pain for the past several years.

The primary objectives of the project were to develop and test an ambassador model that would serve as a successful prototype for KT, increase clinician knowledge about best evidence in chronic pain management, and encourage clinicians to incorporate research evidence into the management of chronic pain patients. In order to develop, implement and test the model, an advisory committee was established with representatives from all of the relevant stakeholder groups in the province, including the authors, the Alberta College of Physicians and Surgeons, the Alberta Medical Association and a representative from one of the rural Alberta health regions. Consultants with expertise in dissemination of clinical practice guidelines, continuing medical education and adult learning complemented the advisory committee.

We developed a workshop format for the program to present research evidence on specific chronic pain interventions to local clinicians. A team that included a clinical ambassador who was a well-recognized provincial leader in continuing education related to pain management, and a research ambassador who was available to explain how the evidence presented was derived from the research literature, conducted each workshop. For each intervention, a comprehensive search and selection process for the best research evidence was undertaken. Systematic reviews and HTA reports were rated by the HTA researchers, and one-page, "evidence-in-brief" summaries of the research evidence were generated. The clinical ambassadors also produced one-paragraph statements of how the research evidence could be incorporated into clinical practice.

We focused on making participation at the workshops appealing, convenient and not too time-consuming. Workshops were held in local communities, at a convenient time of day, with participants (family physicians and pharmacists) able to claim continuing education credits. Strategies for enhancing learning included minimizing didactic material, using a case-based interactive format for KT, inviting a multidisciplinary group of participants and keeping the workshop format flexible so that participants could direct the content to their areas of need. The session was wrapped up by having participants focus on what they learned, on how they might apply it in their practices, and on changes they would like to see in their health region's policies and practices.

Results of the KT experience

Eleven workshops were conducted in eight of the nine Alberta health regions in the fall of 2004. The evidence presented at the workshops covered 18 specific interventions, most of which were related to chronic low back pain. One hundred and thirty health care providers participated, including nurses (27%), physicians (21%), physical and occupational therapists (18%), administrators (17%), pharmacists (9%), and psychologists, mental health, or social workers (7%).

An independent evaluation of the program six weeks after each workshop indicated that the workshop participants found the ambassadors highly credible, appreciated the evidence-in-brief summaries, found the workshop format effective and reported a significant increase in their knowledge of key treatments for chronic pain management. They had begun sharing the evidence and evidence-in-brief summaries with colleagues and with patients. One third of the participants indicated they had made changes to their practice based on what they learned at the workshop.

The case-based, flexible, interactive workshop format engaged multidisciplinary participants who frequently had not previously worked together. Participant post-interviews and anecdotal observations suggested that, in a number of cases, the multidisciplinary group assembled for the workshops continued to communicate and in some cases meet, in order to facilitate the management of patients with chronic pain in their region.

The participants also suggested a variety of topics in pain management and other areas in which they thought the ambassador program could be a good mechanism for KT. These include domains where there is great variability in clinical practice which reflects either a lack of generally recognized effective management plans, or a lack of wide adoption of recent scientific advances.

Lessons learned

A project such as the ambassador program would best serve the needs of practising clinicians if it were an ongoing professional education service.

As a research team, one of the more important lessons we learned from this project arose from the challenge we encountered to our fundamental approach to our professional work. The research ambassadors thrive on precision and are wary of generalizations that "go beyond the data." The clinical ambassadors, however, are sensitive to the needs of clinicians in busy practices who are seeking simple solutions for what they should do in a given case. The tension between the drive for precision and the need for operational simplicity led to active debates on how to present the evidence-in-brief summaries. It also highlighted the need for all team members to appreciate and honour the professional foundations of their colleagues and to recognize the importance of judicious compromise.

After the workshops were completed, participants continued to download the evidence-in-brief summaries from the project website and made periodic requests for additional workshops and other services from the project team. Clearly a project such as the ambassador program would best serve the needs of practising clinicians if it were an ongoing professional education service. A strategy for sustainability is a clear requirement.

A related issue is the "shelf life" of research evidence. Since launching the project, the HTA researchers have updated the literature reviews at four-month intervals. Not surprisingly, at each of these junctures, new systematic reviews were identified which required several of the evidence-in-brief summaries to be substantially updated. This clearly indicates the need for ongoing infrastructure to ensure the latest research evidence is being considered.

The workshops conducted through the ambassador program have provided support for efforts to create a regional, multidisciplinary chronic pain management program.

Conclusions and implications

We are aware of several examples of how the learnings and experiences from the ambassador program have been incorporated into regional action. The Calgary Health Region, which has an ongoing process for developing care pathways and supports for the care of patients with chronic diseases, has incorporated our evidence-in-brief summaries into the low back pain clinical pathway. In another health region, the workshops conducted through the ambassador program have provided support for efforts to create a regional, multidisciplinary chronic pain management program. In a third health region, the clinicians who were initially brought together for the ambassador workshop are continuing to meet on a regular basis to further their professional education and to develop more integrated clinical services.

While the ambassador program appears to hold significant promise as a KT approach, a number of questions remain unanswered. Chief among these are hard data on whether the participants permanently changed their clinical practices, and, if so, the impacts of these practice changes on tangible patient outcomes. Another question relates to the generalizability of the approach. It could be argued that our team was ideal to conduct such a project since we had both the required breadth of skills and a long history of colleagueship. If the ambassador model is to be adopted in other jurisdictions and to other clinical foci, other teams of researchers and senior clinicians will be needed. These teams will face the challenges of resolving scientific and clinical gaps to develop consensus on how best to communicate practice-relevant research evidence and adopt a successful interactive, flexible teaching style. A longer-term commitment will also be required in order to maintain ongoing educational and support services to community-based clinicians.

A COLLABORATIVE EVIDENCE-BASED APPROACH TO IMPROVING WORKPLACE HEALTH AND SAFETY

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The Occupational Health and Safety Agency for Healthcare (OHSAH) was established in British Columbia with joint union and employer governance to develop evidence-based programs to promote better workplace health and safety. A five-year Community Alliances for Health Research (CAHR) partnership resulted in several research-to-practice projects and over $108 million in savings between 2002 and 2005. The involvement of multiple stakeholders from the beginning of the research process, concrete senior management commitment, front line worker involvement and union advocacy for the implementation of research findings were critical factors in the success of these knowledge translation (KT) initiatives.

Background

Community involvement in health research has become increasingly recognized as an effective way of addressing health disparities.[1,2] In the workplace setting, key stakeholders must be involved if research on improving health is to be successfully translated into policy and practice. This case study illustrates how collaboration among unions, employers, government, insurers and an interdisciplinary team of researchers can lead to research that produces high-quality results in practice.

The Occupational Health and Safety Agency for Healthcare (OHSAH) was established in British Columbia with joint union and employer governance to develop evidence-based programs to promote better health and safety and effective early return-to-work practices.[3] In 1999, CIHR established the Community Alliances for Health Research funding program, with objectives that dovetailed very well with OHSAH's mission. OHSAH thus became a vehicle for researchers in B.C. to join forces with health care unions and employers. A five-year research program, *Making Healthcare a Healthier Place to Work: A Partnership of Partnerships*, was established, governed by a research council composed of union leaders, employer representatives, researchers and representatives from both the Workers' Compensation Board of B.C. (WCB) and the insurance carrier for long-term disability.

The KT initiative

The OHSAH-CAHR partnership incorporated a joint labour-management problem solving approach that was crucial to success in addressing the sector's challenges.[4,5] The research program consisted of numerous practice-to-research-to-practice initiatives developed with extensive input from stakeholders, especially health care employers (via the Health Employers Association of British Columbia, as well as specific health region representatives) and the four major health care unions in B.C. The initial research program included the creation of a cohort of health care workers for longitudinal study; a series of studies exploring work-organizational factors and their influences on injury rates in acute, extended and long-term care settings; an intervention study to address risks faced by home care workers; a study of decision making regarding substitution of toxic chemical substances; implementation of a regional occupational health and safety program; and two linked initiatives (discussed below) focused on decreasing injuries and disability from patient handling.

Results of the KT experience

1. The ceiling lift story

Systematic reviews have consistently found that health care workers are at high risk of musculoskeletal injuries (MSIs), with patient handling, lifting, and transfers posing particular problems.[6,7] We conducted a rigorous evaluation of an overhead lift system at an extended care facility in B.C. to determine its effectiveness in reducing staff injuries and decreasing both staff and patient risk and discomfort. The payback period for direct costs associated with this ceiling lift program had been estimated at nearly four years, but our evaluation determined that, when the trend of rising compensation costs was considered, the payback period was almost half the time previously estimated.[8] A follow-up evaluation using three years of additional data revealed a 40% reduction in total claims costs, an 82% reduction in lift and transfer claims costs, and an 83% reduction in lost hours due to lift and transfer injuries.[9] Front line workers reported less pain and discomfort and there was general satisfaction from patients and their families.

> *The combination of quantitative and qualitative results, allowed the audience to see both the bottom-line results as well as the positive impact the lifts had on the workplace safety climate.*

The results were actively shared with decision makers, and a special meeting was held with senior managers, including health authority CEOs and senior WCB, Ministry of Health, and union personnel. Quantitative results, including a cost-benefit analysis, were presented, along with “testimonials” from front line workers and managers. The combination of quantitative and qualitative results, presented in formats ranging from PowerPoint presentations to fact sheets, allowed the audience to see both the bottom-line results as well as the positive impact the lifts had on the workplace safety climate. A CEO of one of the health regions, in hearing the results and recommendations, commented, “This is a no-brainer; let’s do it!”

The B.C. Ministry of Health and the WCB decided to allot over $20 million to the widespread implementation of lifts throughout the province, and also signed an agreement to implement appropriate no-unsafe-lift policies. Additional studies were conducted to address specific scenarios, training materials were developed on how to implement the program and install lifts and a system of ongoing evaluation was introduced.

2. Linking primary and secondary prevention

Injury rates for B.C. health care workers were very high by 1998, with the health care sector accounting for more time-loss claims than any other industries in B.C.[10] The Prevention and Early Active Return-to-Work Safely (PEARS) program was developed with goals of decreasing the incidence of MSIs in health care workers, and decreasing the average duration of time lost to MSIs by returning injured employees to their regular duties more rapidly. It also aimed to identify and evaluate the critical success factors of a safe prevention and early return-to-work program and a culture of safety within the workplace. Joint union and employer steering committees provided guidance to the overall initiative.

> *Due to the savings realized at VGH, the goodwill generated and the knowledge translated to decision makers at the health authorities, PEARS was subsequently expanded to all of B.C.’s health authorities.*

The PEARS program combines three components—primary prevention, early intervention (prompt follow-up of injured workers, targeted workplace modifications and clinical treatment when required) and extensive evaluation. Initially, PEARS was implemented as a pilot program at Vancouver General Hospital (VGH), a large urban acute and tertiary care teaching hospital with over 6,000 employees. Injured employees were offered a range of on-site services such as physiotherapy; review of work tasks with advice and training; work environment assessment with modification and purchase of equipment as necessary; a graduated return-to-work program, consisting of modified duties and/or hours; and access to an on-site physician.

Evaluation of the first year of PEARS revealed that the time taken to return to work after an MSI was significantly less than the previous two years,[11] and the average time-loss-per-person per year for registered nurses was reduced to 3.6 from 4.9 days. This resulted in associated total savings in compensation payments of $176,534, a 33% reduction from the previous year. Due to the savings realized at VGH, the goodwill generated and the knowledge translated to decision makers at the health authorities, PEARS was subsequently expanded to all of B.C.'s health authorities. PEARS programs are currently running in eleven sites across the province and serve over 37,000 health care workers.

Lessons learned

These two examples offer a number of important lessons for KT, as well as the successful implementation of workplace interventions.

The involvement of multiple stakeholders created trust and a shared commitment to the objective of promoting a healthy workplace, as well as raising awareness and support for the initiative itself.

We attribute the success of the ceiling lift intervention to concrete senior management commitment to the health and safety of the workforce, illustrated by their willingness to make the required capital investment, and also to strong front line worker involvement in determining the details of the intervention. It is noteworthy that the study had initially been requested by the health facility that implemented the overhead lift program: the audience was therefore eager to receive the study results. There was also union advocacy for implementation of the findings, combined with solid bipartite support based on the evidence. The involvement of the range of stakeholders from the beginning, and the gathering of top decision makers together to interact with the researchers directly to discuss the findings were key to the success of this KT. Both the quantitative elements of the research, such as the cost-benefit analysis, and the use of qualitative research to collect local stories from various stakeholders, including front line workers and patients, played important roles.

The PEARS program marked a departure from previous injury and disability prevention programs in combining primary and secondary prevention. Preventive activities happen within the workplace where all stakeholders can observe improvement in the work setting, thus generating further confidence in the program. The program also had strong union support, attempted to get all stakeholders on side and had a mandatory ongoing evaluation component. The involvement of multiple stakeholders created trust and a shared commitment to the objective of promoting a healthy workplace, as well as raising awareness and support for the initiative itself.

Conclusions and implications

These and other OHSAH-CAHR initiatives across the health care sector in B.C. have resulted in useful training materials, as well as numerous peer-reviewed articles,[12-14] book chapters,[15] and fact sheets. More importantly, these initiatives led to dramatic decreases in injuries and time loss, producing over $108 million in savings in WCB premiums between 2002 and 2005. The partnership has also resulted in a strong commitment between the partners to continue to work together in conducting high quality research into how best to address both the physical and psychological dimensions of disability in the health care workplace, adopting the same principles of collaboration and excellence in science—or what has been dubbed "good science and good will."

These initiatives led to dramatic decreases in injuries and time loss, producing over $108 million in savings in WCB premiums between 2002 and 2005.

As we go to press, the key stakeholders—the unions, the employers, and the Ministry of Health—have all confirmed their ongoing support for the partnership. Core funding for the KT activity of OHSAH will be continued, and it is hoped that the CAHR program, or its equivalent through other CIHR programs, will continue to fund important research partnerships to support the scientifically rigorous knowledge acquisition that is needed for KT to be effective.

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