

# Knowledge to Action: The Development of Training Strategies

## Des connaissances à la pratique : la création de stratégies de formation

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## Abstract

This paper presents an overview of curriculum and program development activities at the four Canadian Regional Training Centres directed towards the goal of achieving increased knowledge to action. The RTCs have initiated learning opportunities to increase the skills of graduate students in conducting knowledge translation and exchange (KTE). The authors describe similar as well as unique approaches used at each centre to hone understanding and skills. RTC activities include the development of a new four-year residency program for doctoral students, new Web-based and real-time interactive theory courses and new linkages with departments of journalism. While formal evaluation is yet to be completed, interim feedback from participating graduate students has been encouraging.

## Résumé

Cet article présente un aperçu des activités d'élaboration de cours et de programmes d'études entreprises par les quatre Centres régionaux de formation (CRF) dans le but d'accroître le transfert des connaissances à la pratique. Les CRF ont initié des possibilités d'apprentissage visant à accroître les compétences des étudiants des cycles supérieurs dans le domaine de l'application et de l'échange des connaissances (AEC). Les auteurs décrivent les approches similaires et uniques utilisées par chaque centre pour perfectionner les connaissances et les compétences des étudiants. Les activités des CRF comprennent la création d'une résidence de recherche de quatre ans pour les étudiants au doctorat, de nouveaux cours théoriques interactifs sur le Web et en temps réel, et l'établissement de liens avec des départements de journalisme. Quoiqu'une évaluation officielle n'ait toujours pas été effectuée, la rétroaction provisoire des étudiants s'avère encourageante.

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## Key messages

- The need to address the gap between research and policy/practice has created a strong commitment to produce graduates with increased skills in KTE.
- Each RTC has promoted KTE with a view to regional needs and local expertise.
- KTE training strategies must be evaluated to identify those that are most effective.
- Healthcare decision-makers, national funding organizations and KTE experts have played a significant role in graduate student training at the RTCs.

A MAJOR CHALLENGE IN HEALTHCARE SERVICES IS THE ONGOING NEED TO make decisions based on up-to-date, credible research, so that Canadians receive high-quality and effective healthcare. The Canadian Health Services Research Foundation (CHSRF) and the Canadian Institutes of Health Research (CIHR) are leading national initiatives to achieve better knowledge translation and exchange (KTE) for evidence-informed decision-making. CHSRF defines knowledge exchange as:

collaborative problem-solving between researchers and decision-makers that happens through linkage and exchange ... and results in mutual learning through the process of planning, producing, disseminating, and applying existing or new research in decision-making. (CHSRF 2007a)

CIHR's Vice President of Knowledge Translation, Ian Graham, recently refined the CIHR definition to:

a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the healthcare system. (Tetroe 2007: 1)

While the application of knowledge to the business of healthcare is obviously of fundamental importance, the mechanisms are not straightforward. Recent publications present many models (Graham et al. 2006; Sudsawad 2007), strategies (Reardon et al. 2006; Tsui 2006) and anecdotes (CHSRF 2007b) of KTE. However, the use of multiple terms has produced confusion (Greenhalgh et al. 2004). For example, Graham et al. (2006) identified 29 related terms, including *knowledge translation*, *knowledge transfer*, *knowledge exchange*, *research utilization*, *dissemination* and *diffusion*. For the purposes of this paper, we combine the CHSRF and CIHR terms and describe our work related to knowledge translation and exchange, or KTE.

Lomas, in a legacy document (CHSRF 2007b), identified the opportunities and challenges in KTE. One main challenge is that even though we better understand the construct of "evidence-informed," the healthcare system continues to grow in its complexity of problems and issues. As well, the presence of many barriers (organizational, cultural, professional) impedes the application of evidence.

The Regional Training Centres (RTCs) across Canada were launched with the intent to build research capacity in a distinctive way. Researchers trained by these centres will generate new knowledge and have the capacity to work with decision-makers to conduct research. This paper focuses on the strategies for KTE training across these four Canadian training centres, each of which represents a consortium of univer-

sities: Centre de formation et d'expertise en recherche en administration des services infirmiers (Centre FERASI), Atlantic Regional Training Centre (ARTC), Ontario Training Centre (OTC) and Western Regional Training Centre (WRTC). For a detailed description of these centres, refer to the paper by Brachman et al. (2008).

In 2000, when the call for proposals for RTCs was launched, the movement towards KTE was gaining strength, yet few researchers who applied for the grants were experienced in KTE. CHSRF promoted KTE to be a mandate of the centres and facilitated the development of expertise in KTE among researchers and decision-makers (Lomas 2000) through multiple activities. To this end, CHSRF has regularly organized scientific activities to develop a common vision and vocabulary among RTC partners with respect to knowledge translation and exchange. CHSRF also publishes useful tools such as "Mythbusters" and "Evidence Boost", and organizes intensive Research Weeks in various locations. The Centre for Knowledge Transfer was also created at the University of Alberta. This RTC had a national mandate to develop research capacity in KTE (Conrad 2008).

The challenge and priority of the RTCs was to develop effective strategies to train students in KTE. Sparse evidence existed on how to provide effective training for graduate students in this field. Furthermore, there is little evidence of the impact of KTE on patient and health system outcomes, and the effectiveness of KTE strategies remains a methodological challenge (Tetroe et al. 2008).

It is in this complex context that the RTCs have striven to develop training strategies to ensure that students learn to create evidence through research and to exchange knowledge with decision-makers. The objectives of the training centres are well represented by the "knowledge-to-action model" developed by Graham et al. (2006), which encompasses the creation of knowledge as well as the utilization of that knowledge in action. Knowledge creation through conducting research has traditionally been the focus of academic training programs; however, the application of research to practice and policy has received less attention by academics.

In this paper, we describe KTE activities that focus on the application of knowledge to practice and policy for healthcare. The four centres commonly have requirements for practicum or residency placements, theory courses and participation in workshops, and are also increasing their linkages across a wider range of disciplines. The following discussion highlights two of these strategies per centre.

## Training Strategies

### Centre FERASI

Centre FERASI (Centre de formation et d'expertise en recherche en administration des services infirmiers/Training and Expertise in Nursing Administration Research) is a consortium of four universities in Quebec: Montreal, Laval, McGill and Sherbrooke.

The Centre FERASI is dedicated to building research capacity in nursing services administration and has invested in two main strategies that involve KTE.

First, an alliance with the Chaire GETOS (Gouverne et transformation des organisations de santé, directed by J.L. Denis) was created so that students can take the course "Connaissances et changement" (45 hours; J.L. Denis and P. Lehoux). The objectives of the course are (1) to define the interface between knowledge and practices according to different paradigms, (2) to develop an understanding of the issues in creating links between the scientific community and the practice community, (3) to define and analyze different modes of knowledge production and the links with communities of practice and (4) to understand the evolution of scientific policies in terms of knowledge application.

Parallel to this course, a second strategy focuses on linking doctoral students with a health organization through a research residency, whereby students are paired with decision-makers of that organization during the four years of their doctoral studies. The main objectives of the research residency are for the student (1) to develop an in-depth understanding of a problem related to the administration of nursing services in an organization and to develop an awareness of how the decision-makers use knowledge to take action, (2) to experiment in the methods for the creation of knowledge in a context where they are associated with decision-makers and (3) to put KTE strategies into practice. For the decision-maker in the organization, usually a director of nursing or a chief nursing officer, the objectives are two-fold: (1) to develop or reinforce a culture of research in the organization and (2) to advance KTE in the organization. The KTE experience is continuous across four years and is closely aligned with decision-makers' needs. Decision-makers invest material and financial resources by providing an office and a computer and half the funding to the student. The research residency is undergoing an evaluation, and preliminary analysis shows favourable results. Among 20 students who are undergoing this research residency, six have been interviewed. The added value, according to those respondents, is increased:

- understanding of the organizational challenges in research and KTE;
- level of awareness of their role as research partner;
- alignment of their research question with the context of the organization;
- acquisition of knowledge of applied research;
- networking within the organization and with the research community;
- feeling of belonging and less isolation during doctoral studies;
- methodological choices based on a better understanding of the organizational context.

There are also challenges:

- framing research results in a way that satisfies the tension between an independent external view and a view from within the organization; and
- being a gateway to evidence-based practice, which translates into many requests for a doctoral student to manage.

The research residency is considered an innovative strategy to train researchers in creating and transferring knowledge. Students recognize the value of communicating their research and working closely with decision-makers. One student commented:

The principal challenge for us is to find a balance between the fulfillment of the academic program in the time prescribed, the participation in the activities of the organization and the participation in the university life. During residency, it is necessary to become a producer of knowledge and, at the same time, an intermediary in the process of knowledge transfer. In a way, the residency makes the doctorate more complex, but at the same time one leaves with a great satisfaction from it. (2006)

### Atlantic Regional Training Centre

The Atlantic Regional Training Centre (ARTC) in Applied Health Services Research is a collaborative venture among four Atlantic Canadian universities: Dalhousie University in Nova Scotia, Memorial University of Newfoundland, the University of New Brunswick and the University of Prince Edward Island. As with the other training centres, the ARTC focuses on training researchers to bridge the gulf between research and practice. From the inception of the master's program in applied health services research, the curriculum planners ensured that knowledge translation and exchange was a core feature of the program. The ARTC approaches KTE in two main ways: a Web-based distance education course, and workshops.

A core course, "Knowledge Transfer and Research Uptake," is offered in the second year of the program after students have completed 10 courses and a residency. This Web-based distance education course combines peer-reviewed and grey literature, websites, online discussions and written and oral assignments to explore the facilitators and barriers to the use of research evidence in decision-making in the healthcare system. The course introduces students to research transfer methods such as working with decision-makers at all stages of the research in order to enhance the dissemination and implementation of research findings in clinical, management and policy decisions.

A unique aspect of the ARTC approach is that the Knowledge Transfer and Research Uptake course is entirely online. Students are placed into heterogeneous groups based on their experience with knowledge translation. They select a group

name, such as “Trendy Translators and Research Tools”. They have weekly readings, quizzes and online discussions. Students, in their groups, interact with one another based on a knowledge translation topic. A typical discussion challenge is: Think about the organization where you did your internship. What was its relationship with academic researchers? What could they do to improve the awareness of research done in their community? And on the flip side, what could researchers do to increase the organization’s awareness of research evidence?

Students must post an answer, and then respond to and question their group members, seeking more detail and analysis. This interactive forum allows the students to question, probe, challenge and affirm one another. It is exciting to see the progression in their knowledge and thinking vis-à-vis knowledge translation issues.

Supplementing this course work, students have the opportunity to meet personally and connect with decision-makers in two three-day workshops. These workshops give students an opportunity to network, take sessions that enhance their programming and listen to academics regarding healthcare challenges. The workshops highlight knowledge translation issues and some have focused on knowledge brokering as a career. Each student is also required to develop a knowledge translation plan for his or her thesis, and evaluate knowledge translation initiatives of an organization.

One student, in her online discussion, wrote:

Programs like the ARTC allow students to gain insight and knowledge about the “real world.” With courses in KT and policy, we learn the importance of networking, collaboration and relationship building with the partners who are involved in the research (i.e., researchers, communities/populations and policy makers). (November 23, 2007)

Another student wrote:

... There seems to be a general interest from the organization side as well – health organizations are respectful and interested in working with students from the ARTC because they have a desire to contribute to current knowledge utilization in the respective fields. Centres like ARTC contribute to knowledge utilization in their very existence – by teaching, sharing and having intellectual dialogue surrounding current research (another form, really, of active knowledge exchange!). (November 26, 2007)

The students recognize the importance and challenges of knowledge translation and how research must connect with policy development as it is infused throughout their program. In any training program, the theories and strategies of knowledge translation need to be incorporated to ensure that the students see the value and acquire the

knowledge to facilitate knowledge translation of research into decision-making. This notion of infusing applicable KTE approaches coincides with the RTCs' purpose.

### Ontario Training Centre

The Ontario Training Centre (OTC) for Health Services and Policy Research graduate diploma program involves students from six participating universities (Lakehead, Laurentian, McMaster, York, Ottawa and Toronto). The OTC is a competency-based program, with one of the core competencies defined as the "ability to effectively exchange knowledge and develop research partnerships (e.g., citizens, health care providers, decision-makers at all levels)" (OTC 2007).

One of the early activities of the OTC was to review available courses related to KTE at the participating universities. In 2003, only one course was available at the University of Toronto that addressed the KTE core competency, but this course was not accessible to students at the other participating universities. Thus, the OTC initiated a call for proposals for the development of a new KTE distance course accessible to all OTC students.

The new course was developed in 2004 by a sociologist, Ian Graham, and by a nurse, Barbara Davies, experienced in research about intervention strategies for KTE. The course includes critical appraisal of clinical practice guidelines, systematic reviews and patient decision aids, as well as theoretical models, attributes of innovations and knowledge transfer strategies for professionals. A course pack of selected readings is available at all sites for easy access to key references. Assignments require participants to identify a potential solution to a practice or policy gap, assess the evidence and stakeholders' perspectives and design a pragmatic implementation intervention. The topics selected by students are diverse, such as lay dietary trans-fat policy, physical activity for bone health and involving lay health workers to enhance adherence to treatments in disadvantaged populations.

A hybrid teaching approach is used with a combination of traditional weekly interactive seminar discussions by teleconference, as well as Web-based course materials. Participants at multiple sites are connected by special software to see the same presentation simultaneously.

A unique feature of the course is the involvement of CIHR and CHSRF staff in the teaching of some of the weekly topics, such as policy makers' perspectives, and knowledge brokers as change agents. Student feedback about how their knowledge is expanded by this course is illustrated in the following two examples:

Learning about skilled ways to apply research to practice has been extremely valuable. My other graduate classes in the health sciences have addressed many aspects of quality research, but have remained vague on relevant ways to increase effective use of research. (2007)



I was unaware of knowledge translation models prior to this course. I likely could have located them in the literature, but participating in this course, where students have developed ideas for translation projects, and listening to feedback from our tutor experts, has really strengthened my understanding of how, when and why I might use specific models. (2008)

When asked what specifically works, participants report that they appreciate access to the course from various locations (i.e., home, office). In addition, they report that they value a pragmatic approach:

What worked for me was the stepwise practical example of developing the basis for an innovation and going out and doing fieldwork. Conducting interviews was very enlightening for me in terms of understanding the barriers and facilitators to the adoption of innovation. The one I chose to look at was advanced access, and I am now taking what I have learned to try to move it forward in my day job. (2007)

OTC students are also required to complete a 200-hour policy practicum with a decision-maker partner. Thus, all students gain experience developing research partnerships with healthcare organizations. OTC graduates have reported that the policy practicum is a highlight of the program in terms of attaining hands-on experience to generate evidence-informed policy. The OTC program values KTE as a core required element in this policy practicum.

### **Western Regional Training Centre**

Western Regional Training Centre for Health Services Research is a partnership between three universities: University of British Columbia (UBC), University of Alberta (UA) and University of Manitoba (UM). The WRTC program focuses on and develops student competency in the communication of research outcomes and implications to enhance evidence-informed decision-making through two main strategies: alliance with a school of journalism and field placement.

First, given that KTE involves communication, the WRTC developed a close working relationship with the UBC School of Journalism. Videoconference linkages between the two sites have presented both didactic and participatory sessions, engaging students in press release and news writing. The journalism students provide critiques on structure, writing style and use of language. These sessions have had a powerful effect on students' understanding of how to tell a story that is factually complete, compelling and concise.

Secondly, KTE is a central activity of the WRTC field placement experience.

Students spend approximately four months working full-time for a decision-maker organization on a project identified by the decision-maker. They have the opportunity to see how KTE and communication are carried out in decision-maker organizations. Also, students are responsible for presenting their field placement project work to the healthcare organization in a concise and meaningful way, thus emphasizing the importance of both the translation (making the content relevant and understandable) as well as the transfer (targeting the right communication skills) to the specific audience – for example, front-line staff or management—of their own work. These experiences are powerful precisely because the students' own work is the primary focus and students' KTE knowledge and competency are tested on a daily basis. One decision-maker commented after hosting a WRTC field placement:

... because of the academic focus these students bring, you can be assured that the evidence brought to inform planning and decision-making is current, reliable and relevant.

One student commented:

... [the field placement was] an opportunity to practise adapting the formal writing style of academia to a more informal style for practitioners and policy makers.

## Common Features Across the Centres

To date there has been no formal evaluation of the impact of including KTE in graduate training programs. We do not know the most effective methods for increasing knowledge and skills in KTE. While decision-makers have been remarkably positive participants, we do not know the optimum intensity and duration of practicum or residency placements. A systematic evaluation of our activities, from the perspective of the participating students, faculty, decision-makers and funding agencies, is an important consideration for the future. However, in the meantime, for others interested in enhancing their KTE activities or developing new graduate learning opportunities, we observe several common elements in our programs:

- collaboration across universities within a region to share knowledge and experiences;
- active interprofessional approach across different disciplines;
- development of new KTE theory course requirements;
- development of concentrated KTE practicum course requirements with decision-makers; and

- initiation of required KTE seminars, workshops or both.

The development of training activities in the RTCs to facilitate knowledge to action has some innovative features. These include:

- sustained exposure to decision-makers in a policy practicum or residency, and not simply brief episodic encounters;
- course content about the application and evaluation of knowledge translation theoretical models;
- opportunities for practical experience in KTE;
- seminars and workshops with professionals from different disciplines who are skilled in communication.

## Conclusion

As is evident from the preceding discussion, each RTC values and incorporates KTE learning opportunities for students. These include focused courses and networking opportunities with decision-makers. We note that the discussion of our own program requirements provided an opportunity for us to learn from one another and to share strategies.

Students who participate in the RTC programs value the expertise they acquire in knowledge translation and exchange. They recognize their role in promoting evidence-informed decision-making, whether as a researcher, knowledge broker or decision-maker. Upon completion of their training program, graduates have increased knowledge and skills to contribute to enhanced knowledge translation that links research results with actions to improve healthcare.

The RTCs recognize that KTE is a relatively emerging field of research. Research and evaluation are needed to identify best practices in both training in knowledge translation and in knowledge exchange strategies that work to improve policy and practice. As we provide graduate students with a foundation in KTE, the impact of their work in the field of health and nursing services research ought to be documented and evaluated.

Presently, many students in the graduate programs of the RTCs have conducted master's and doctoral research in the field of KTE. They are creating a base of research that is needed to understand and critique models, strategies and tools of knowledge translation and exchange.

The KTE focus has made the RTCs a distinctive training model and added value to applied health and nursing services research and practice. The RTCs have provided applicable ways for students to be trained, and approaches that involve decision-makers in students' experience and education.

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