

Riding the Knowledge Translation Roundabout:

Lessons learned from the Canadian Institutes of Health Research Summer Institute in
Knowledge Translation

¹Michelle E. Kho, BSc(PT), MSc, ²Elizabeth A. Estey, BA, MA ³Ryan T. DeForge, MSc,

⁴Leanne Mak, BA, MA, and ⁵Brandi L. Bell, BA, MA

¹Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton,
ON, Canada

²Centre for Aboriginal Health Research, University of Victoria, Victoria, BC, Canada

³Department of Health and Rehabilitation Sciences, The University of Western Ontario,
London, ON, Canada

⁴Department of Psychology, University of Manitoba, Winnipeg, MB, Canada

⁵Comprehensive School Health Research, University of Prince Edward Island,
Charlottetown, PEI, Canada

Running head: Riding the KT Roundabout

Number of Figures: 0

Number of Tables: 5

Word Count (manuscript): 1945

Word Count (abstract): 99

Corresponding author for the group:

Michelle E. Kho
McMaster University
1200 Main Street West
MDCL 3200
Hamilton, ON
L8N 3Z5
Canada
Phone: (905) 525-9140 x22012
Fax: (905) 526-6775
e-mail: khome@mcmaster.ca

Abstract

Funding education and training of the next generation of health researchers is a key mandate of the Canadian Institutes of Health Research (CIHR) knowledge translation (KT) portfolio. From June 22-25, 2008, the CIHR hosted the Innovation in Knowledge Translation Research and Knowledge Translation Summer Institute (KTSI) in Cornwall, Ontario, Canada. In this report, we outline the curriculum of the KTSI, document our experiences, and present key lessons learned. We suggest that this training model is helpful to KT organizations and funding agencies, as investment into KT personnel will foster the advancement of the field within and beyond local borders.

To the individual who devotes his/her life to science, nothing can give more happiness than when the results immediately find practical application. There are not two sciences. There is science and the application of science, and these two are linked as the fruit is to the tree.

- Louis Pasteur, 1871 (from presentation by Ian Graham, 2008 CIHR Knowledge Translation Summer Institute)

Introduction

Knowledge translation (KT) is a young field that is grappling with its definition, terminology, and methodologies [1, 2]. At the most basic level, however, KT is about putting knowledge into action. In this paper, we use the Canadian Institutes of Health Research definition of KT: *“a dynamic and iterative process that includes 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 health care system”*. With a legal mandate for KT, the CIHR has made significant contributions that are recognized both nationally and internationally [3]. Funding education and training of the next generation of Canadian health researchers in KT is an important part of the CIHR’s KT portfolio, as these opportunities ensure that a mandate for knowledge translation is sustained within the research and decision making communities[4].

One example of a training initiative is CIHR’s Innovation in Knowledge Translation Research and Knowledge Translation Summer Institute (KTSI), which occurred from June 22-25, 2008 in Cornwall, Ontario, Canada. This intensive, 4-day strategic capacity-building institute was funded by the CIHR’s Institutes of Health Services and Policy Research (IHSPR), Population and Public Health (IPPH), and the Knowledge Synthesis and Exchange Branch. Dr. Jeremy Grimshaw of the CIHR

funded KT-ICEBERG (Improving Clinical Effectiveness through Behavioural Research Group)[5] and the Clinical Epidemiology Program of the Ottawa Hospital Research Institute (OHRI) was the host. Through faculty engagement and a variety of different teaching methods, 30 Canadian trainees actively learned about the science of KT. As five of those participants (brought together through small group work during the KTSI), we offer this paper to share the curriculum of the KTSI, document our experiences, and present some of the key lessons learned.

What the KTSI Entailed

Over 150 trainees applied to fill the 30 spots available for the KTSI through a competitive process (Table 1 outlines the KTSI questions applicants completed). Almost all successful applicants were enrolled in doctoral studies or held post-doctoral fellowships focused on KT. Participants represented 16 different Canadian institutions, and a variety of faculties and departments, including communications, engineering, health promotion, and political science. Twelve faculty with KT expertise representing Canada, the United States, and the United Kingdom, shared their knowledge and experience with trainees (Table 2 outlines the KTSI faculty and Table 3 describes the daily program and curriculum). Among trainees, there was a sense that the mix of different learning forums informed by educational theories about adult learning factored greatly into the success of the KTSI. For example, didactic lectures from faculty, one-on-one meetings between trainees and faculty, and active learning sessions where we worked through a “real” KT problem in small groups enabled an effective learning environment.

From our perspective, the small group work provided the most useful opportunity to apply our new and existing knowledge of KT because it gave us time and space to interact with our peers and to learn by doing. Thus, we had the freedom to learn as we worked, the chance to turn to faculty mentors when we needed them, and the opportunity to see first-hand the complexity, confusion, and multiple stages required in developing a KT strategy (Table 4 outlines the small group project).

Key Lessons Learned

Because the KTSI provided us with many diverse opportunities to learn and share knowledge, we all continuously drew our own lessons and ideas. However, there were some key lessons that resonated within our small group. We share these lessons here because we think they highlight the essence of our experience and demonstrate how education and training can facilitate a deeper understanding and passion for KT (and potentially other areas of health research).

Throughout the KTSI, faculty constantly reinforced our first lesson: that KT is **interdisciplinary and collaborative**. Because the goal of KT is to use research in health care practice, it inherently involves partnership. Therefore, researchers from various disciplines (e.g., sociology, medicine, psychology, nursing, nutrition, engineering, etc.) engage in KT research and we need different people to fill many roles within the context of the research. The CIHR distinguishes between end of grant KT and integrated KT (IKT) [4,6]. In the former case, this partnership may extend beyond the core research team at the end of the project to include communications experts to help with the dissemination of findings.

In integrated KT, however, partnerships with community organizations, stakeholders, and other related parties occur throughout the research, from the development of the research question to its dissemination. Thus, IKT is often likened to participatory action research (PAR), which includes similar principles of engagement, partnership, and reciprocity in research. While IKT differs from traditional investigator-initiated research in that it is jointly initiated, developed, and implemented by the researcher and the knowledge user(s), its goals remain the same: to use scientific rigor to develop understanding and facilitate action. And while IKT research creates challenges for new researchers (e.g., takes more time, does not easily fit into a CV or traditional tenure and promotion processes, limits the control researchers have over the project), it brings the benefits of interdisciplinary learning and development (e.g., opportunities to build a shared understanding of barriers and facilitators to implementation) [7, 8].

Because KT is interactive and collaborative, **negotiation skills** are integral: good negotiation skills and an effective mediation strategy are necessary to keep a large-scale research project, including its multiple researchers, partners, and support staff, on track. Through our group work, we identified the importance of negotiation and found that even in this brief time, creating a safe space to allow team members to express ideas, and finding ways to manage our differences in opinions and perspectives were keys to our success. We appreciated our assigned faculty members who acted as facilitators and content experts.

Having negotiation strategies and supports are essential in the “real world” of KT, as the process is **complex, confusing, and multifaceted**. While this can make KT

research “messy” it also means that it is interesting, engaging, and can be an incredible learning experience for the research team. We certainly found this during our group work; the process was complex and frustrating at times. Ultimately, we connected as a team, learned a lot about ourselves and about each other, and learned about a new area of and approach to research.

Finally, we learned about the importance of using the **most rigorous methods of inquiry to answer different research questions**. Although most of the research presentations and plenaries at the KTSI focused on quantitative methods, participants expressed interest in hearing about research utilizing qualitative and/or mixed methods in understanding and evaluating KT. We were reminded at the KTSI to be cautious not to fall into an “us vs. them” (i.e., qualitative vs. quantitative methodologies) quagmire in doing KT research, but instead to foster interdisciplinary research and evaluation in addition to ensuring interdisciplinary care provision in health care. Table 5 summarizes our key lessons learned from the KTSI.

Riding the KT Roundabout

For our group, Dr. Melissa Brouwers’s presentation and her metaphor of a traffic roundabout helped us make sense of the lessons we learned and experiences we had at the KTSI. A roundabout, or traffic circle, is a road junction where multiple roads feed into a one-way stream of traffic traveling around a central island. The one-way stream of traffic in the roundabout consists of diverse cars and drivers – different makes and models driven by different people from different backgrounds. In KT, the continuous traffic around the central island represents the core research team in a KT project: this

group has a constant presence and is engaged throughout the project. The cars, trucks and motorcycles that come in and out of the roundabout represent the various partners and stakeholders (e.g., community members, content experts, service delivery personnel, methodological experts, policy makers, users, evaluators, etc.) who provide input and expertise along the way. Ensuring that the mixing of these two streams of “traffic” happens at the right time and the right place is essential for ensuring that there are no KT accidents!

While the roundabout metaphor presented by Dr. Brouwers was useful for understanding the process of KT research, we also found that it spoke to our group’s experiences at the KTSI. In essence, we, the participants, are the next generation of KT “drivers” and the KTSI gave us our first driving lesson and glimpse at the field of KT. Further, the activities of the Institute helped us learn how to negotiate the complexities of the discipline and its own “rules of the road”. Both formal and informal opportunities for mentorship provided guidance through the rules and encouraged us to take the wheel. As trainees, faculty supported us to chart a path of our own, learn from our own mistakes, and reach our own conclusions. By way of modeling and actively engaging in mentorship, the KTSI faculty members helped trainees realize how and when to utilize each other’s strengths to overcome our individual and collective weaknesses. It is the lessons such as these and opportunities for engagement, such as at the KTSI, that was truly enriching and will have a long-lasting effect on the discipline of KT and its trainees.

Post-KTSI

The KTSI facilitated many invaluable opportunities for its participants, and we

suggest this model may be helpful to inform future training initiatives internationally. The KTSI formed an international network of participants with interests in KT and facilitated important interpersonal relationships between trainees and faculty. All attendees expressed interest in maintaining relationships, keeping abreast of each other's work, and participating in future KT training opportunities. Post-KTSI, faculty led the development of an electronic mailing list and website informing participants of upcoming international KT opportunities for training and funding. This paper is just one example of the many outcomes that have arisen from the KTSI's network and faculty-trainee mentorship relationships. In another example, electronic communication between KTSI participants and faculty helped inform the curriculum for a conference workshop on KT. The variety of outcomes from the KTSI (e.g., newly formed relationships, sharing of ideas and resources, active scholarship) are a testament to the success of the workshop. We encourage other national and international KT organizations and funding agencies to consider replicating the training model employed here, as investment into KT personnel will foster the advancement of the field within and beyond local borders.

Conclusion

We take away from our first traffic lesson provided at the KTSI insight about the importance of relationships, the complexity of interactions, the significance of timing, and the potential for ingenuity and innovation in the field of KT. These lessons are important for us as we strive to situate ourselves within the field of KT research, and for others interested in and/or already engaged in the field. We suggest that key strengths

of the KTSI included the interdisciplinary backgrounds of the participants, use of adult-centered educational learning techniques, and opportunities for active learning through small group projects. Suggestions for future institutes include providing more information on the complementary nature of qualitative and quantitative methods, ongoing communication between participants and faculty, and consistent ongoing opportunities for in-person interactions between participants and faculty. Because of our positive experiences at the KTSI and the proven benefits of mentorship and training, we advocate for a continued focus on the next generation of researchers, both in KT and in other areas of research.

Acknowledgements

The authors are grateful for the opportunity to participate in the 2008 CIHR Summer Institute. We thank Drs. Jeremy Grimshaw, Sharon Straus, Ian Graham, and Melissa Brouwers for thoughtful comments on the manuscript. We are grateful to the Canadian Institutes of Health Research for funding our travel and accommodation at the Summer Institute. Michelle Kho is funded by a Fellowship Award through the Canadian Institutes of Health Research (Clinical Research Initiative). Ryan DeForge is the recipient of an Ontario Graduate Scholarship. The Canadian Institutes of Health Research did not influence the design, conduct, or interpretation of this report.

References

1. Eccles M, Grimshaw J, Walker A, Johnston M, Pitts N. Changing the behavior of healthcare professionals: the use of theory in promoting the uptake of research findings. *J Clin Epidemiol*. 2005 Feb;58(2):107-12.
2. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, et al. Lost in knowledge translation: time for a map? *J Contin Educ Health Prof*. 2006 Winter;26(1):13-24.
3. Pablos-Mendez A, Shademani R. Knowledge translation in global health. *J Contin Educ Health Prof*. 2006 Winter;26(1):81-6.
4. Canadian Institutes of Health Research. About knowledge translation - the KT portfolio at CIHR. [cited 2008 Last accessed November 29, 2008]; Available from: <http://www.cihr-irsc.gc.ca/e/29418.html>
5. KT-ICEBERG (Improving Clinical Effectiveness through Behavioural Research Group). [cited 2008 Last accessed November 29, 2008]; Available from: <http://www.iceberg-grebeci.ohri.ca>
6. Graham ID, Tetroe J. How to translate health research knowledge into effective healthcare action. *Healthc Q*. 2007;10(3):20-2.
7. Cargo M, Mercer SL. The value and challenges of participatory research: strengthening its practice. *Annu Rev Public Health*. 2008;29:325-50.
8. Salsberg J, Louttit, S., McComber, A.M., Fiddle, R., Naqshbandi, M., Receveur, O., Harris, S.B., Macaulay, A.C. Knowledge, Capacity and Readiness: Translating Successful Experiences in CBPR for Health Promotion. *Pimatisiwin: A Journal of Indigenous and Aboriginal Community Health*. 2008;5(2):125-50.
9. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Qual Saf Health Care*. 2005 Feb;14(1):26-33.
10. Abraham C, Michie S. A taxonomy of behavior change techniques used in interventions. *Health Psychol*. 2008 May;27(3):379-87.
11. Sackett DL. On the determinants of academic success as a clinician-scientist. *Clin Invest Med*. 2001 Apr;24(2):94-100.
12. Manuel DG, Tanuseputro P, Mustard CA, Schultz SE, Anderson GM, Ardal S, et al. The 2003 Canadian recommendations for dyslipidemia management: revisions are needed. *CMAJ*. 2005 Apr 12;172(8):1027-31.

Table 1: Applicant questions

1. Write a brief description describing your current research project or plans, and how KT and/or KT research is embedded within them (maximum 300 words).
 2. Write a brief description of your expectations of the Summer Institute on Knowledge Translation and Knowledge Translation Research and how the Summer Institute experience fits with the direction of your studies or career path (maximum 500 words).
 3. Please outline here any voluntary, work or practice experience that you have that would be relevant for understanding why you wish to attend our Summer Institute and the experience that you bring with you (maximum of 500 words).
-

Table 2: Faculty members at the 2008 Canadian Institutes of Health Research Summer Institute

Name	Title(s)	Affiliation(s)
Laurie M. Anderson, PhD	Health Scientist	US Centres for Disease Control and Prevention
Richard Baker, MD	Professor of Quality Health Care Head, Department of Health Sciences	University of Leicester, United Kingdom
Melissa C. Brouwers, PhD	Associate Professor Provincial Director, Program in Evidence-based Care Project Lead, Capacity Enhancement Project	Department of Clinical Epidemiology and Biostatistics, McMaster University, Canada Cancer Care Ontario Canadian Partnership Against Cancer Corporation
Donna Ciliska, RN, PhD	Professor, School of Nursing Scientific Director	McMaster University, Canada National Collaborating Centre for Methods and Tools
Jill J. Francis, PhD	Health Psychology Lead, Health Services Research Unit	University of Aberdeen, United Kingdom
Ian D. Graham, PhD	Vice-President of Knowledge Translation	Canadian Institutes of Health Research
Jeremy M. Grimshaw, MD, PhD	Director, Clinical Epidemiology Program Canada Research Chair in Knowledge Transfer and Uptake	Ottawa Health Research Institute, Canada University of Ottawa, Canada
John N. Lavis, MD, PhD	Director and Investigator Canada Research Chair in Knowledge Transfer and Exchange	Program in Policy Decision-Making McMaster University, Canada
Doug G. Manuel	Senior Scientist Associate Professor	Institute of Clinical Evaluative Sciences, University of Toronto, Canada Department of Public Health Sciences, University of Toronto,

Name	Title(s)	Affiliation(s)
		Canada
Craig R. Ramsay	Programme Director Senior Statistician	Health Care Assessment Program of the Health Services Research Unit, Aberdeen, United Kingdom
Jon Salsberg, MA	Research Manager	Department of Family Medicine McGill University, Canada
Sharon E. Straus, MD, FRCPC, MSc	Associate Professor Canada Research Chair in Knowledge Translation	Department of Medicine, University of Calgary, Canada Department of Medicine, University of Toronto, Canada Li Ka Shing Knowledge Institute, University of Toronto, Canada
Charles Weijer, MD, PhD	Canada Research Chair in Bioethics	University of Western Ontario, Canada

Table 3: Curriculum at the 2008 Canadian Institutes of Health Research Summer Institute

Activity	Presenter	Topic
Day 1		
Welcome	Jeremy Grimshaw	
Plenary	Ian D. Graham	Knowledge translation at CIHR <ul style="list-style-type: none"> • CIHR's conceptualization of KT • Presentation of CIHR's definition of KT (integrated and end of grant) and CIHR's KT strategy[4] • Overview of CIHR's KT funding opportunities
	Laurie M. Anderson	Knowledge for knowledge translation <ul style="list-style-type: none"> • Overview of the challenges faced in utilizing systematic reviews for policy-making purposes
Plenary	John N. Lavis	Knowledge translation for policy makers <ul style="list-style-type: none"> • Presentation on KT in policy contexts, and the similarities and differences between policy and clinical KT practices
In the spotlight	Ian D. Graham	Overview of his academic and career path from graduate school to current professional position.
Day 2		
Plenary	Jon Salsberg	Integrated knowledge translation (IKT) <ul style="list-style-type: none"> • Overview of IKT in contrast to end-of-grant KT: Emphasis of IKT on researcher-participant collaboration throughout the entire research

Activity	Presenter	Topic
		process[8]
Introduction to group work	Jeremy Grimshaw	
Group work		
KT in Action	Melissa C. Brouwers	<p>Advancing the quality of cancer care: An intersection between KT/KTE research, a Health Service, and a Health Care System</p> <ul style="list-style-type: none"> • Knowledge translation described as a traffic roundabout and the need to carefully engage different stakeholders at the right time, optimizing their expertise. • Discussion of the role of knowledge transfer techniques in helping health care providers, administrators, and government make better decisions. • Description of Cancer Care Ontario's Program in Evidence-Based Care evidence-based advice incorporating stakeholders' perspectives in evidence production and review.
Plenary	Sharon E. Straus	<p>Knowledge translation targeting health care professionals</p> <ul style="list-style-type: none"> • Outline of different means of assessing practitioner needs, emphasizing the importance of local context • Discussion of barriers to knowledge-to-action (e.g., time, skepticism, accessibility of evidence, etc.) • Overview of strategies for assessing and evaluating KT interventions
Plenary	Jill Francis	<p>Behavioural approaches to knowledge translation</p> <ul style="list-style-type: none"> • Consideration of the usefulness and application of theories (i.e., theory of planned behaviour) in shaping a KT strategy.[9]

Activity	Presenter	Topic
		<ul style="list-style-type: none"> • Discussion of some factors involved in behaviour change when considering the effects of a KT intervention.
Group work		
Plenary	Jill Francis and Jeremy Grimshaw	Developing knowledge translation interventions <ul style="list-style-type: none"> • Discussion of behaviourally-focused approach to informing knowledge translation interventions • Use of intervention mapping and matching intervention techniques to theoretical constructs to strategically design studies[10]
Discussion / Group task	Sharon E. Straus	Mentorship[11]
Day 3		
Plenary	Jeremy Grimshaw	Knowledge translation research <ul style="list-style-type: none"> • Overview of the inherently interdisciplinary nature of KT research as a relatively new and broad field • Current evidence base provides little practical guidance for health care systems about which interventions are best • An emerging body of evidence shows that it is possible to change stakeholder decisions and behaviours
Group work		
KT in Action	Doug Manuel	KT in action: Population benefit of Canadian Lipid Guidelines <ul style="list-style-type: none"> • Overview of a data-driven approach to estimate the population impact of

Activity	Presenter	Topic
		implementing Canadian lipid guidelines[12] <ul style="list-style-type: none"> • Describes <i>synthesis, partnerships, & evaluation</i> as three fundamentally important components of successful KT
Plenary	Craig Ramsay	Evaluating knowledge translation interventions <ul style="list-style-type: none"> • Cluster Randomized Trials (RCT) as the 'gold standard' for evaluating KT • Advantages of using RCT: evidence that the effects of the KT intervention are attributable to the intervention, i.e., higher internal validity. Challenges of using RCT: must be cautious of inter-cluster effects; need large sample sizes • Interrupted Time Series design an alternative if a RCT is not possible; this mitigates some of the error inherent in simple pre-post designs
Group work		
Plenary	Donna Ciliska	Knowledge translation in public health <ul style="list-style-type: none"> • Overview of the National Collaborating Centre for Methods and Tools, which focuses on methods and tools for knowledge synthesis, translation, and exchange • The Center conducts KT in public health, evaluation studies, and capacity development and provides tools such as PublicHealth+, health-evidence.ca, etc. • Outlined one particular study on the use of a knowledge broker in moving evidence into practice for obesity prevention
Plenary	Richard Baker	United Kingdom perspectives <ul style="list-style-type: none"> • Provided an overview of the national improvement program and pay for performance scheme in the UK

Activity	Presenter	Topic
		<ul style="list-style-type: none"> Described the impact of the 1997 election of the New Labour Party in the UK, thus providing a historical context to the progress of KT in the UK
Faculty and student interaction		Trainees had opportunities to book 15-minute one-on-one meetings with faculty members of their choice to discuss career plans or research.
Day 4		
Plenary	Charles Weijer	Ethics of knowledge translation and knowledge translation research <ul style="list-style-type: none"> Provided an overview of research ethics and implications for knowledge translation research Initiated a healthy discussion of differences between quality assurance initiatives and research using a current exemplar
Group presentations	Trainees	

Table 4: Small Group Task

1. Tasks

1. Design a knowledge translation strategy for CHSRF *Evidence Boost* – Allow midwives to participate as full members of the healthcare team.
 2. Design a knowledge translation strategy for CHSRF *Mythbusters* – The risks of immunizing children often outweigh the benefits.
 3. Design a knowledge translation strategy for CHSRF *Mythbusters* – Direct-to-consumer advertising is educational for patients.
 4. Design a knowledge translation strategy for the Capacity Enhancement Program of the Cancer Guidelines Action Group of the Canadian Partnership Against Cancer Corporation.
 5. Design a knowledge translation strategy to reduce inappropriate use of antibiotics for upper respiratory tract infections in primary care settings.
-

2. Design and evaluation considerations

1. What should be transferred? To whom should research knowledge be transferred? With what effect should research knowledge be transferred?
 2. What are the likely determinants (barriers and facilitators) of knowledge translation?
 3. By whom should research knowledge be transferred? How should research knowledge be transferred?
 4. How will you know whether the KT strategy was effective? How will you know why your KT strategy was/ was not effective?
-

Legend for Table 4: In this table, we outline the 5 different KT challenges taken on in the small group work as well as the design and evaluation considerations for the small group tasks. Acronyms: CHSRF – Canadian Health Services Research Foundation.

Table 5: Summary of our key lessons learned from the KTSI

1. KT is interdisciplinary and collaborative
 2. Negotiation skills between team members are integral to success
 3. KT is complex, confusing and multifaceted
 4. Use of the most rigorous methods of inquiry to answer different research questions is important
-