PROMISING PRACTICES IN KNOWLEDGE TRANSLATION
FOR RESEARCH USERS

A REVIEW OF THE LITERATURE

Prepared for the
ARCTIC HEALTH RESEARCH NETWORK – YUKON

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Executive Summary

The Arctic Health Research Network works towards building research capacity in the north. Ensuring that research findings are relevant to northerners is a part of this undertaking. To that end, this literature review summarizes the most promising practices of knowledge translation (KT) as they relate to key audiences in the north: Indigenous communities, the public at-large, health practitioners, and policy-makers and program planners.

Knowledge translation is a process that actively moves research information to those who use it, to help people make decisions about health and health care. KT practices are those that enable people to engage in research; access, contextualize, and adopt research evidence; help integrate it into practice and evaluate outcomes, as well as share lessons learned. Promising KT practices identified in this review include:

- **Indigenous knowledge** is a central element of Aboriginal approaches to health, wellness, and healing. KT practices must therefore be grounded in the knowledge system of a particular Indigenous community to be effective.
- **Upholding the principles of OCAP** is key for ensuring that people's rights are respected, for securing community benefits, and building research capacity.
- **Participatory and collaborative practices** (e.g. participatory research, professional networks, communities of practice, inter-professional collaborations) can help build lasting relationships, facilitate knowledge sharing, and tailor research to users' needs.
- **Systematic reviews and other decision aids** are tools that provide timely, relevant, and comprehensive research information to policy makers, health practitioners, and the public at-large.
- **Information technology** provides an important means to disseminate and access research, connect people with one another, and facilitate knowledge sharing.

- **Interaction with a change agent** (e.g. knowledge broker, opinion leader, expert, consultant) improves research utilization. These individuals can provide guidance or give support to the use of research evidence.

- **Training** decision-makers in knowledge translation can augment leadership skills and strengthen organizational or community capacity to use research more effectively.

KT science offers little direction in terms of 'gold standards' or evidence-based best practices leading to increased research use. Conversely, there is also little empirical evidence of the effectiveness of KT practices on the basis of their ability to inform and assist people in their decision-making. Effectively, determining which KT practices are most appropriate requires an understanding of a particular decision-maker's needs and decision-making environment.

The North needs particular attention in terms of identifying and developing KT practices to suit its particular geographical, organizational, cultural, and demographic characteristics. A few suggestions are offered at the end of this report on strategies to bring KT to northerners.

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Introduction

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It is estimated that 40% of patients are not receiving care compatible with the best available evidence and that 20% of care is not warranted or even potentially harmful (Grol and Grimshaw 2003). Such estimates reflect the lag and difficulty in incorporating research evidence into practice, also referred to as the *know-do gap*. Knowledge translation in a term developed by the Canadian Institutes of Health Research (CIHR). It refers to a process that actively moves the findings or evidence from health research from its creators to its users (whom are not necessarily mutually exclusive), with an aim to improve all levels of decision-making about health and health care. Ensuring that health studies result in meaningful and effective healthcare practices and healthy outcomes is a complex and challenging project requiring collaboration from all individuals and groups that have an interest in health.

Review methods

A literature search was conducted in biomedical science and social science abstract databases for articles published between 1994 and 2007 (University of Manitoba Libraries catalogue (BISON), Medline on PubMed, Scopus (Life Sciences, Health Sciences, Physical Sciences, Social Sciences), CSA Illumina (Education, ERIC, Health Sciences, Psychology, Sociological Abstracts, Social Services Abstracts, Sociology), Ebscohost (CINAHL, pre-CINAHL, Academic Search Elite, and GoogleScholar).

Combinations of the keywords: *knowledge, translation, transfer, uptake, exchange, communication, sharing, utilization, synthesis, policy-makers, researchers, clinicians* and *traditional knowledge* were used. This was also combined with various indigenous peoples wording (e.g. *Métis, Indigenous, First Nations, native peoples, Inuit, Alaskan,* and *American Indian*).

A similar keyword search was performed on the Internet search engine Google to capture the available grey literature on knowledge translation (e.g. reports, websites, and conference and workshop presentations and proceedings). The systematic reviews of the Cochrane Library (www.cochrane.org) were also searched.

When a lack of evidence prevented best KT practices from being identified (e.g. due to an inconclusive systematic review), it is through literature supporting a potential to overcome one or more communication barriers (see pages 11-12) that promising practices of knowledge translation were selected.

The extent of the findings are limited and bounded by 1) the source of the data (much of the information reviewed is of a published and often peer-reviewed nature); 2) the principal disciplinary area searched (i.e. KT-related research), 3) the broad scope of user groups and difficulty in classifying them (recognizing that there are varying levels and overlapping areas of decision-making within and across user groups, e.g. legislative vs. administrative policymakers, health planners within Indigenous communities), and 4) the lack of an evidence-base in inferring best practices.

What is knowledge translation?

For the purposes of this review, *knowledge* is discussed primarily in terms of the empirical knowledge generated through scientific health research. The *translation* of that knowledge is the process of making it useable or tailored to the specific requirements and understandings of the people who will use it.

The Canadian Institutes of Health Research (CIHR) has defined knowledge translation (KT) as "the exchange, synthesis and ethically-sound application of researcher

findings within a complex system of relationships among researchers and knowledge users. In other words, knowledge translation can be seen as an acceleration of the knowledge cycle; an acceleration of the natural transformation of knowledge into use." (CIHR, 2004). It is a broad, albeit researcher-centered, concept encompassing all stages between the creation of new knowledge and its application. It includes knowledge dissemination, access, communication, contextualization, uptake, management, exchange, implementation, and use. It also includes the ethical context in which KT occurs; the evaluation of the application of that knowledge and the technologies and consensus guidelines that aid it (CIHR 2004). It requires a high level of interactivity between people and an awareness and respect of the contexts in which people work and live (Landry et al. 2006).

Why is it important to research users?

"Research, by itself, does little to affect change" (Lyons and Warner 2005:1).

There has been widespread acknowledgement within the public health research literature that the transfer of research findings into practice is often a slow and haphazard process (Graham et al. 2006). On the one hand, those who want and need scientific evidence have difficulty keeping up-to-date with the accumulating information and sifting through it for relevant, timely, and comprehensible information. On the other hand, health researchers are often unfamiliar with their target audience.

Knowledge translation was originally viewed as knowledge transfer: a one-way, passive and linear process. Findings were published, to be read and used. With today's massive amount of research, information cannot be simply diffused. The consequences of such unproductive knowledge transfers include findings ill-suited to the 'real world'; underutilized knowledge in decision-making; an inefficient use of already limited health care resources; and ultimately suboptimal health care (Graham et al. 2006).

From Aboriginal peoples' perspective of research use, preserving and maintaining Indigenous knowledge and practices of health and healing and ensuring that western

health research is community-based and conducted in accordance with the principles of OCAP are foremost concerns (IPHRC 2005; NAHO 2006).

From a practitioner's perspective, evidence-based medicine is a fundamental component of clinical decision-making. Knowledge about the best treatments available is vital for providing quality health care (Cook et al. 1997).

From a policy perspective, an ethical need to be more accountable in the allocation of publicly funded and limited resources has lead to a push for more evidence-based public health initiatives (Armstrong et al. 2006). The use of terms such as *evidence-based policy*, *informed choice*, *strategic research*, and *research-to-policy* are indicative of the valued alliance between research and policy (Almeida and Báscolo, 2006). To address the *know-do* gap, health researchers are now increasingly asked to produce policy and practice-relevant research findings. At the same time, policy-makers and program planners are encouraged to practice evidence-based management, which includes making the best use of health research knowledge.

Principles of effective knowledge translation

There are important principles that set the stage for effective knowledge translation to transpire regardless of the target audience:

- **Tailored information** – KT efforts will vary according to the type of research to be translated (e.g. medical, Aboriginal health, clinical practice, health services, and public health) and be tailored to the targeted users of that information (e.g. patients, Indigenous peoples, front-line practitioners, program planners, and policy-makers) (Lavis et al. 2003; Thompson et al. 2005);

- **Timeliness** – People lack the time to find, assess, synthesize, interpret, and incorporate research evidence into their decision-making. Attempts to make efficient the process of knowledge uptake translates into efforts for improving credibility, trust timeliness and relevancy, access and delivery, and training (Dobbins et al. 2004a).

- **Interactive process** – Passive dissemination strategies alone are relatively ineffective. KT can help solve real-world problems only when there exists an active exchange of information between knowledge producers and users (CIHR 2004);

- **Multiple strategies** – A combination of knowledge translation strategies reinforces messages, relationships, and reaches potential users at multiple levels, increasing the potential for knowledge uptake (Lavis 2006; Dobbins et al. 2007);

- **Continuous process** – Successful KT is a long-term process that requires sustained stakeholder collaborations (CIHR 2004);

- **Contextual** – Successful KT involves strategies that take into consideration the contextual variables in which KT takes place (e.g. culture, organizational priorities, geography, barriers and limitations) (CIHR 2004),

- **Capacity-building** – Enabling research use also involves building knowledge uptake capacity in the end user through the acquisition of new skills and training (Lavis 2003), and

- **Uncertain outcome** – The adoption of information is a behavioural change and therefore can never be assured, nor should it be expected. Information uptake is dependent on a complex set of situational and personal variables (McWilliam et al. 2003; Kerner 2006).

Barriers to effective knowledge translation

Landry et al. (2006) identify five types of communication problems in moving information between stakeholders.

1. **Knowledge access** - The basic ability to learn of and retrieve information in a timely and useable format can be hindered by vast amounts of information and difficulties in access (e.g. digital divide, intellectual property, cost) resulting in lost opportunities and the reinventing of wheels. Social networks, knowledge repositories, knowledge brokers, and search engines facilitate information access.

2. **Knowledge incompleteness** – When critical evidence-based information (i.e. proof that the evidence works in practice) is absent from research findings, the practical meaning of these findings looses its pertinence and value.

3. **Knowledge asymmetry** – When a cognitive distance exists between the producers and the users of knowledge a climate of misunderstanding and distrust is created that impedes knowledge translation strategies. Collaborative efforts that establish trust, such as regular face-to-face meetings can bridge this cognitive distance.

4. **Knowledge valuation** – The transfer and exchange of knowledge happens when the value gained from the knowledge exceeds the costs involved (in time, energy, and goodwill). Again, activities that help build social capital seem to ease knowledge transactions.

5. **Knowledge incompatibility** – KT activities and the ways information is delivered (e.g. via a trusted source or in a culturally appropriate way) need to be compatible with the needs, life or work contexts, values, skills, and resources of knowledge users to favour knowledge uptake.

Promising practices in knowledge translation

In the following section, the most promising KT practices identified are presented for Aboriginal communities, the public at-large, health practitioners, and policy-makers and program planners. Each audience seeks different things from research and has different preferences in terms of information format (Lomas 1997).

For Aboriginal peoples, research information is but one component of a broader conceptualization of health that needs to be considered within the context of Indigenous knowledge, culture, and realities (Smylie et al. 2006).

More generally, the consumer of health information (e.g. patients and caregivers) requires research evidence and advice in plain language form, set in a relatable context for making conscientious decisions about their health, health care options, and quality of life.

Health practitioners (e.g. physicians, nurses, social workers) require research evidence and recommendations on the effectiveness of care, illness management, and treatment adoption, to keep practices and advice to patients and clients in line with the best available evidence. In their decision-making, practitioners balance this with their own clinical experience, the resources available to them, and the particular patient/client context (Almeida and Bascolo 2006).

Policy-makers and program planners generally view research as an instrument that can inform decisions about health and health care. Research evidence competes with organizational and political considerations. Actionable recommendations and ideas are more useful information formats than data. Timeliness and relevance are the most commonly reported facilitators to the use of research evidence by decision-makers (Dobbins et al. 2007).

1. Indigenous communities

1.1 Indigenous knowledge translation

"The worldviews that guide the western and Indigenous knowledge traditions are sufficiently different that we not only have to understand and interpret the respective views of life, but we have to also translate the language that is the description of that world" (IPHRC 2005:5). It is only when we acknowledge and respect these knowledge differences that appropriate KT practices can ensue (Ranford and Warry 2006).

For Indigenous peoples, **"knowledge translation is indigenously led sharing of culturally relevant and useful health information and practices to improve health status, policy, services, and programs"** (Dr. Janet Smylie, Indigenous Peoples' Health Research Center 2005: 19).

This implies that KT activities must be developed within the context of Aboriginal communities, grounded to the knowledge system of a particular community. If the

mainstream objective of KT is improving health and health services, for Aboriginal peoples perpetuating Indigenous knowledge, culture, and healing practices are equally important health objectives.

Indigenous peoples' vision of health should be reflected in KT methods to be effective (Smylie et al. 2004; IPHRC 2005). The most appropriate practices of knowledge translation reflect a wholistic conceptualisation of health, with activities and messages oriented towards wellness rather than illness (Julia and Knodrat 2005). Thus, programs and dissemination efforts should be attentive to the determinants of wellness: the historical, social, and economic realities of people's lives (Wexler 2006;), the patterns of living and communicating (Strickland et al. 1999), and the importance of spirituality in health and healing (Smylie et al. 2006).

1.2 Modes of communication and dissemination

Dr. Smylie suggests the following insights into the nature of communication and knowledge sharing within Aboriginal communities. Taking these features into account may be key in successful KT strategies (IPHRC 2005):

- Valuing experiential knowledge

- Influence of community structure on information flow

- Oral spread of information through family and community networks

- Preference for 'within community" messages

- Influence of colonization on message and medium

- Valuing of community leadership and participation

Specifically, message can comprise Indigenous (locally-derived) knowledge and indigenized (adapted) biomedical knowledge to make messages more meaningful and relatable (Julia and Kondrat 2005).

Vignette 1. An example of Indigenous health information

> On the Warm Springs Indian Reserve in Oregon, public health nurses and elders work collaboratively to educate mothers about placing babies on their backs to sleep to prevent SIDS. This modern health care practice is predated by the traditional custom of carrying babies upright in cradleboards. In the "Back to the Boards" class, new mothers are taught how to make a cradleboard, a cultural practice that makes the health message more relatable (McLean 1997).

Vignette 2. Examples of Indigenized health knowledge

> The Talking Circle is a cultural technique used by many Aboriginal peoples for collective decision-making and developing group processes. It is also a culturally appropriate way to convey health education information through the oral tradition alongside other group activities such as storytelling, prayer, and the sharing of experiences (Struthers et al. 2003).

1.3 Participatory research

Participatory research (PR) is a collaborative approach that promotes a partnership between researchers and Aboriginal communities. The process should "result in shared power, equitable resourcing and mutual understanding, and help the research proceed in a manner that is culturally sensitive, relevant, respectful, responsive, equitable and reciprocal with regard to the benefits shared between the research parties and the Aboriginal community" (CIHR, 2007: 19).

More specifically, PR enables the researcher to gain contextual understandings and provides valuable for often-inaccessible knowledge from the people who will benefit from the research. For the community members involved, PR allows for genuine input into the research purpose, design, direction, and analysis and it ensures that knowledge is constructed appropriately. Both parties work collaboratively towards the common goal of improving health.

Through PR, the community also broadens its knowledge of the particular health issue and develops the capacities to address it and other health concerns. As such, PR can be a tool for community capacity-building allowing for knowledge uptake through learning opportunities and skills training in research, health promotion, and service

delivery (Salsberg et al. 2008); accessing external sources of funding, and increasing social capital through community participation and ownership, community structures (organized groups and committees), and by linking with others (in partnerships, coalitions, and networks) (Fletcher et al. 2008).

Vignette 3. Capacity-building through research partnerships

During a 2-year PR study on Inupiat youth suicide and culture loss in Northwest Alaska, community members requested suicide prevention services and education from the researcher. This in turn strengthened credibility and trust and allowed for more relevant research findings to emerge (Wexler 2006).

A 3-year program evaluation was undertaken of a mental health service for American Indian and Alaskan Native families using a participatory approach. The process was facilitated by training community stakeholders in evaluation procedures and involving them as co-investigators; thus building capacity for future community program evaluations (Jumper Thurman et al. 2004).

1.4 Ownership and control of research

"Research users must not only participate in the research process from the beginning, but must exercise a degree of control or ownership over the research process if results are to be seen as meaningful and useful" (Elias and O'Neil 2006: 46). First Nations in Canada have established a set of principles known as OCAP (ownership, control, access and possession of research data) that frames researcher-community relations and ensures self-governance of information and that people's rights are respected (AFN 2007). Elias and O'Neil (2006) note that reaching consensus around OCAP principles in a research partnership can be onerous, particularly over issues of data stewardship and confidentiality. Conflict can impede research and KT activities. Building mutual respect and understanding and detailing the mechanisms for conflict resolution should form an integral part of research agreements (Ranford and Warry 2006).

Vignette 4. Research grounded in the OCAP principles

An OCAP success story: The Regional Health Survey (RHS)
The RHS was a completely First Nations' controlled survey. Possession of the survey data was a catalyst for the training of First Nations decision-makers in population health research tools, skills, and approaches. Policymakers and planners were presented with the learning opportunity to work with the survey data to answer policy-related questions specific to their communities, effectively building in-house capacities. Federal government access to the First Nations data was governed by specific RHS license to use agreements (Elias and O'Neil 2006).

A growing number of communities (e.g. Kwanlin Dün First Nation in Yukon, Kahnawake Schools Diabetes Prevention Project) and organizations (e.g. Indigenous People's Health Research Center, CIHR) have developed research and ethics guidelines and policy and review processes to ensure that research projects uphold the principles of OCAP, protect individuals, their values, knowledge, and traditions, secure community benefits, and build capacity.

Vignette 5. An academic and community peer-reviewed journal

Pimatisiwin is a web-based international, but largely Canadian, journal of Indigenous and Aboriginal community health, accessible free of charge at www.pimatisiwin.com. It offers a forum for the sharing of knowledge and research experience between researchers, health professionals, and Aboriginal leaders and community members. Its peer-reviewed process includes an academic and a community-based reviewer for each submission.

2. The public at-large

"The people have the right and duty to participate individually and collectively in the planning and implementation of their health care" (WHO 1978).

2.1 Systematic reviews

Cochrane reviews are designed to help a range of audiences, including health information consumers (e.g. patients, family members, caregivers, patient advocacy

organizations), make informed decisions about health and healthcare issues. Plain language summaries are often included in each review for the non-academic reader. Reviews are available electronically at www.cochrane.org.

Vignette 6. Consumer-oriented systematic reviews.

A unique participatory approach is employed by the Cochrane Musculoskeletal group (www.cochranemsk.org) where the input and guidance of consumers and patient groups (e.g. the Arthritis Foundation of Canada) ensure that the systematic reviews created are timely, relevant, intelligible, and accessible to lay audiences (Shea et al. 2005).

2.2 Other decision-making aids

Some practical components facilitating information transfer between clinicians and patients have been suggested. These include devising plain language summaries of medical advice of different lengths and various levels of detail; illustrating risk information graphically, and providing written decision aids to patients. These user-friendly tools are designed to help patients prepare to discuss with their physician the treatment options available (Santesso et al. 2006).

A systematic review found that sending out reminders increased all types of vaccinations. Reminding people over the telephone, sending a letter or postcard, or speaking to them in person were all effective methods, whether reminders originated from a medical office or public health clinic (Jacobson and Szilagyi 2005).

In another systematic review, evidence of the effectiveness of mass media interventions showed a potential for these popular communication channels to influence the use of health care interventions (Grilli et al. 2002).

Vignette 7. A source of plain language summaries of scientific consensus reports

Greenfacts.org is a web-based resource that brings complex scientific reports on timely environment and health issues to the reach of ordinary consumers. Peer-reviewed summaries of consensus reports are published in three increasing levels of detail. Health-related topics range from asthma and AIDS to second-hand smoke and genetically modified crops. Source documents are from reputed organizations such as the World Health Organization and the International Agency for Research on Cancer (www.greenfacts.org).

3. Health practitioners

3.1 Change agents

Even when research evidence is sound and applicable, it may still be incompatible in nature to the practitioner's experiential and intuitive knowledge and fails to be considered. The research literature on which processes are best at transferring research evidence suggests that a hallmark of KT interventions, invariable of the audience, is interaction with a change agent. That is, an expert, a knowledge broker, a credible leader, or simply a trusted source of information that can provide guidance (Lavis et al. 2003; McWilliam et al. 2003; van Kammen et al. 2006). In a systematic review evaluating the effectiveness of using opinion leaders in healthcare settings, Doumit et al. (2007) found that such people can promote evidence-based practice through for instance small group teaching, formal lecturing, and face-to-face visits with frontline workers.

Vignette 8. Using ambassadors to promote evidence-based practice.

An ambassador program focusing on improving the quality of pain management was introduced in Alberta. Using a workshop format, a well-known healthcare education leader and a researcher presented the best available evidence on chronic pain interventions to local healthcare providers (e.g. nurses, physicians, therapists, administrator, pharmacists). Workshop participants found the ambassadors highly credible, appreciated the evidence-in-brief summaries, and found the workshop format effective. More importantly, they reported a significant improvement in their knowledge of key treatments for chronic pain management (Taenzer et al. 2006).

3.2 Inter-professional collaborations

The spread of knowledge is a function of the ease of communication and collaboration between and within disciplines. This takes an investment of time, mutual respect, and shared understandings and goals (Robinson and Cottrell 2005). Some evidence suggests that effective inter-professional collaboration, communication, and training can be conducive to the diffusion of evidence-based practice and can lead to excellence in health care (Zwarenstein and Reeves 2006; Reeves et al. 2008). Some inter-professional mechanisms that could lead to evidence-based practice have been proposed. Namely, that in a climate of good inter-professional communication and collaboration: 1) the reporting of patient information and its uptake is expected; 2) that people feel at ease reporting to others potential gaps in their decision-making and 3) an awareness of the value of evidence-based decision-making among the different professional groups is shared (Zwarenstein and Reeves 2006).

3.3 Communities of practice

Communities of practice (CoP) are often self-organized groups of professionals in the same field who work together on a common issue or topic in order to improve individual and organizational performance. Knowledge sharing and sustained professional collaboration form the cornerstones of a CoP. Time needs to be invested in social interactions to develop trust and common understandings between members (Robinson and Cottrell 2005; Barwick et al. 2006). A community of practice can be an important resource for the practitioner overloaded with information. Persons with expertise can be identified and consulted. Face-to-face meetings can ease the discussion of common issues and new ideas can be created and tested in a safe environment (CHSRF 2006).

Vignette 9. Examples of Communities of Practice

Virtual CoPs are a promising tool for networking and information sharing.

- **Safer Healthcare Now!** has developed CoPs of healthcare professionals dedicated to implementing patient safety interventions (www.saferhealthcarenow.ca).

- McMaster University is currently developing a **virtual CoP for street nursing** to better inform nursing practices related to homelessness and poverty (http://streetnursing.mcmaster.ca).

3.4 Systematic reviews

"Utilization of research evidence in practice is inhibited by skills and knowledge gaps, unhelpful information formats, and limited time for decision-making and information consumption" (Thompson et al. 2005: 440). Likewise, Formoso et al. (2007) contend that while peer-reviewed literature is a relevant source of information for health practitioners, much of it is targeted at researchers rather than practitioners. The evidence often lacks practical relevance or an explanation as to its substantive contribution to existing knowledge. The authors add that research information needs to be translated into a useable and tailored form; one that emphasizes clarity and comprehensiveness, provides synthesis, and allows the reader to evaluate the validity, biases, quality, and practical relevance of scientific information. Currently however, tools that tailor single-study research evidence to practitioners are lacking.

Alternatively, systematic reviews on the effectiveness of health care interventions are considered to be the best available tool for understanding and applying evidence-based medicine. Systematic reviews rigorously summarize and critique, concisely and transparently, the evidence from all relevant studies on a topic of interest (Cook et al. 1997). For this, they must however be comprehensive, of high quality, and updated regularly (Grimshaw et al. 2006). For the health professional, they reduce reading time and the need for critical appraisal skills. Practitioners can thus focus on assessing the applicability of the evidence to their clinical context (Lavis et al. 2006). Despite their promising attributes for moving research evidence to practice, systematic reviews appear to be under-used by practicing medical leaders (Grimes et al. 2008).

Vignette 10. Cochrane systematic reviews

The **Cochrane Collaboration** is a world-wide organization that aims to assist policymakers, practitioners, and health consumers in making well-informed decisions about health and healthcare by producing high-quality systematic reviews and developing review methodology. The Cochrane Library (www.cochrane.org) compiles, synthesizes, reviews, and disseminates thousands of health care intervention reviews for practitioners. Comments and critiques of the reviews are encouraged and posted. A subscription is required to access full-text reviews but the abstracts and plain language summaries, when available, are free and available online (Grimshaw et al. 2006).

3.5 Information & communication technology

Information and communication technologies provide a range of knowledge translation opportunities that hold a potential to strategically benefit health professionals by accelerating knowledge transfer (e.g. by delivering reminders, transmitting electronic medical records, accessing web resources, videoconferencing, enabling discussion forums, feedback mechanisms, and learning programs, and evaluating competences). Online networks can also provide linkages between health practitioners in isolated communities in the form of health information, organizational updates, support, and collaborative interactions (Starling et al. 2005). There is still however, a lack of evidence on how best to effectively use technology-enabled KT to ensure a fit with the particular needs and contexts of practitioners (Ho et al. 2004).

Vignette 11. A clearinghouse for informing policy and practice about Indigenous health

Health Infonet is an Australian clearinghouse for published and unpublished information on Indigenous health. It also provides a place for people from across the country, from different sectors, and different organizations to network and share information and experience (www.healthinfonet.ecu.edu.au).

4. Policymakers and program planners

4.1 Networks

A long-standing knowledge translation difficulty is the perception of *two communities*: that researchers and policymakers are separate groups with their own working cultures and perspectives about research and knowledge (Lavis 2006). The challenge is to bridge the *know-do* divide by encouraging interactions and exchanges between and within the two cultures to ensure that the knowledge generated by research is contextually relevant, timely, and applicable for these decision-makers (Lomas 1997; Graham et al. 2006).

While it is difficult to measure the impact on policy change, evidence suggests that interactions in the form of partnerships and networks can be useful for increasing knowledge uptake (Landry et al. 2003; McWilliam et al 2003; Lavis 2006). "Networks work to facilitate knowledge sharing, creation and dissemination, build relationships to link and involve researchers and policy makers in the research and policy process and train people in research and policy making skills, as well as knowledge translation skills" (IDRC 2003). Whether formal or loosely organized, networks bring together health professionals from different fields: researchers, policymakers, program managers, and knowledge brokers, around a common goal or issue. Opportunities for live exchanges are vital to dissolve epistemological boundaries and develop common understanding and inter-professional collaborations. Information technology is not a replacement for face-to-face meetings but it can be useful for sustaining networks (McWilliam et al. 2003; CHSRF 2005a). Website clearinghouses, databases, newsletters, and listserves may be useful electronic networking tools (Dobbins et al. 2004b).

Vignette 12. Examples of inter-professional knowledge networks

> The **Need to Know Team** is a CIHR-funded collaboration between the Manitoba Centre for Health Policy, rural and northern regional health authorities, and Manitoba Health, helping decision-makers learn how to use research findings at all levels of planning. Researcher-user partnerships help create new knowledge relevant to the needs and priorities of health authorities and help improve organizational capacity, effectiveness and service delivery (CHSRF 2005c).

4.2 Systematic reviews

In their study of 833 Canadian policy-makers, Landry et al. (2003) found that the efforts that promoted research use where the ones that tailored research to users' needs and built capacity among decision-makers. Systematic reviews are one such tool that can address a broad array of questions asked by public health professionals. They are meant to be efficient and concise, more substantive than single studies, and adapted to the knowledge culture of decision-makers. Dobbins et al. (2001, 2007a) have identified a strong demand from Canadian public health decision-makers for policy-relevant systematic reviews. While still not as rigorously developed and evaluated as clinical systematic reviews (Lavis 2006), they have been shown to influence the development of public health policy (McWilliam et al. 2003; Dobbins et al. 2004b).

Vignette 13. Systematic reviews for policy

> **Health-evidence.ca** is a website providing quality research evidence to public health decision makers through a searchable registry of systematic reviews and meta-analyses. Reviews are screened for relevance to public health and health promotion, appraised for quality, and the evidence and implications are clearly spelled out. Topics range from addiction and substance use to healthy communities and social determinants of health.
>
> The **Cochrane Effective Practice and Organisation of Care Group** (www.epoc.cochrane.org) makes available reviews of interventions designed to improve professional practice and the delivery of effective health services (e.g. continuing education, quality assurance, informatics, financial, and organisational and regulatory interventions).

4.3 Change agents

On its own, increasing the availability of information appears to do little to promote knowledge utilization. Passive dissemination methods such as journal publications place the responsibility for behavioural change on the reader (Formoso et al. 2007).

The use of change agents (i.e. influential people and experts) can provide "education, champion a cause or product, or give support to staff around the diffusion and implementation of a clinical practice guideline, protocol or research evidence" (Thompson et al. 2004: 692). The idea is that change agents are able to actively, skillfully, and influentially bring relevant knowledge to the attention of their clients, thereby disseminating, facilitating and influencing uptake, demonstrating commitment, and ultimately affecting behaviours and practices.

Consultancy has been suggested by Jacobson et al. (2005) as another effective tool for knowledge uptake. Consulting is broadly defined as a process of transferring expertise, knowledge or skills with an aim to providing help or solving problems. Three main factors appear to motivate decision-makers to using consultant-derived knowledge: the urgency of the problem, the expertise and credibility of the consultant, and the degree of client involvement or "buy-in" in the project. As in community-based participatory research, the greater the engagement by end users, the more useful, relevant and acceptable the information.

Vignette 14. Using knowledge brokers to improve policy

Knowledge brokers were used to create a partnership between the four Atlantic provinces and the Heart and Stroke Foundation leading to improvement in patient care. The brokers were able to increase policy maker support for a new stroke care program by helping the partnership along, getting past obstacles (e.g. a slow start, political change, and trust issues), maintaining momentum, facilitating communication, and inciting participation (Lyons et al. 2006).

4.4 Success stories

Success stories have been used extensively in business and education as a means to promote discussion and document results. However in public health and health

promotion, success stories are seldom published, perhaps because this requires time and production skills or it may be that appropriate venues for this type of anecdotal evidence are scarce. Nevertheless, valuable lessons can be taken from practice to help other planners and managers improve programs, gain organizational support, and inform the public about program benefits (Lewis et al. 2004). While evidence supporting success stories as an effective KT practice is currently lacking, the transfer of applied knowledge ensures that knowledge is translated to the end user in a compatible form. It is noteworthy that the Canadian Health Services Research Foundation has adopted success stories as a KT strategy for managers (see vignette 15).

Vignette 15. Sharing success stories

Promising Practices in Research Use is an electronic series from the Canadian Health Services Research Foundation (CHSRF) (www.chsrf.ca/promising) targeting health professionals. It highlights organizations that have invested time, effort, and resources in order to successfully increase their capacity to use research.

Insight and Action is a digest that provides summaries of evidence-based KT studies for end users on KT concepts such as networks, brokering, dissemination and research use (www.chsrf.ca/other_documents/insights_action/index_e.php).

4.5 Training

For an organizational culture to be receptive to research use, decision-makers need to create staffing environments, infrastructure, and processes conducive to knowledge uptake and implementation. 'Receptor capacity' or the capacity an organization has to translate research evidence into practice has only begun to receive attention as a KT component, yet it is a vital element for enabling evidence-informed management of health systems (Denis et al. 2008).

Modifying an organization's ways of doing requires decision-makers capable of guiding such changes and leading collaborative and networking practices. Such leadership and capacity-building skills can be successfully developed through training programs that lead to tangible improvements in health services delivery (see Umble et al. 2005; Denis et al. 2008).

Vignette 16. A training program in evidence-informed decision-making

The **Executive Training for Research Application (EXTRA)** is a 2-year fellowship program for health services professionals in senior leadership positions interested in evidence-based decision-making for improving healthcare services. Its curriculum includes health research literacy, leadership training, collaborative skills, understanding the linkages between research and practice, and learning how to create, manage, and sustain an organizational culture that promotes research use. Internships help policy-makers apply their newly acquired skills to intervention projects within their own organization.

Gaps in research

1.   A lack of evidence-based best practices

The current state of KT science offers little direction in terms of 'gold standards' or best practices leading to increased research use. To date, evidence-based KT, irrespective of its targeted audience, lacks a solid empirical base in supporting or refuting the effectiveness of KT practices. Systematic reviews of the effectiveness of KT practices (e.g. in an Aboriginal context, multifaceted interventions, audits and feedback, tailored interventions, organizational capacity-building initiatives, education and training, systematic reviews for policymakers, multidisciplinary collaborations, and the use of change agents) are either non-existent or lack strength as individual studies are often conflicting, of poor design quality, or too few (Grimshaw et al. 2004; Lavis 2006; Sudsawad 2007; Thompson et al. 2007). Moreover, given that KT should be regarded as a long-term, continuous endeavour, longitudinal studies are also lacking.

2.   Exploring the decision-maker's needs

A popular yardstick by which many KT studies have measured the 'effectiveness' of KT practices is through evidence of their capacity, persuasion, and predictability to change behaviour in order to promote the use of research findings (see Sudsawad 2007). Thompson et al. (2007) however suggest that this objective and search for generalizability may be unattainable: "Drawing conclusions about the effectiveness of research utilization interventions based on changes in provider behaviour alone is probably an unreliable approach, because it is not clear how much of a behaviour change can be ascribed to research use and how much to other factors." (par. 7). Certainly, decision-making relies on experience and situational contexts as much as, if not more so than research evidence (Chunharas 2006) and it can shift and evolve over time. Accordingly, a broader framing of 'best' practices is proposed by Green and Kreuter (2005): "The notion of best practices should be viewed as a process…that enables planners to tailor strategies and methods to the unique circumstances of a given place or

population" (p.21). In other terms, in may be preferable to assess KT practices, not so much by their capacity to influence behaviour change and increase research use, as to understand how they can inform and assist people in their decision-making.

KT science is relatively new and evolving. Effectively, little is known about policy-makers, health professionals, and publics in terms of 1) their research-related information needs, 2) their level of awareness of information sources, 3) their access to information, 4) their preferences for format and content, 5) the impact of information on decision-making and on health outcomes, and 6) their capacity to use information. In fact, few publications are written or co-authored by research users or at the very least make a methodological point to consult with them.

In this light, the field could benefit from future research endeavours that include:

1. Participatory two-way research approaches involving those who use research evidence;

2. Long-term research partnerships to build understanding for different ways of knowing,

3. Comprehensive case studies that help trace the contours of how, when, and why health research is utilized,

4. Qualitative research approaches that can explore context and meaning in decision-making,

5. Social scientific evaluation criteria for assessing KT practices, and

6. Capacity building components (e.g. training, expertise) that give stakeholders added value in the research enterprise.

3. What of the North?

If the situational context of decision-making is vital to developing KT practices, then the North needs particular research attention. The unique geographical, organizational, cultural, and demographic characteristics of northern communities create distinctive knowledge translation challenges and opportunities. Such challenges include:

*   High professional turnover rates,
*   Community remoteness,

- Lack of financial and human resources,

- Limited internet connectivity,

- Difficult and costly travel logistics,

- Reliance on out-of-province specialized care,

- Duplication of services and programs,

- Language translation

- Limited capacity in rural and Aboriginal communities, and

- Differences between Western and Indigenous knowledge and culture

Opportunities include:

- Interdisciplinary networking opportunities due to a small population base,

- High public health and health promotion services to population ratio,

- A culture of community consultation and participation,

- General recognition of the wholistic nature of health and the importance of quality of life, and

- First Nations governance.

Conclusions and recommendations

The framework below represents one way to conceptualize research use (Figure 1). It begins with a research process (participatory or not) and follows with the access to research findings, the contextualization of this information for/by the decision-maker, its adoption and application, the evaluation of the impacts of this application, and ends (provisionally) with a potential for sharing information about the lessons learned. The cycle is applicable to any type of decision-maker. Examples for KT practices that help move research information along are listed at each stage in the cycle.
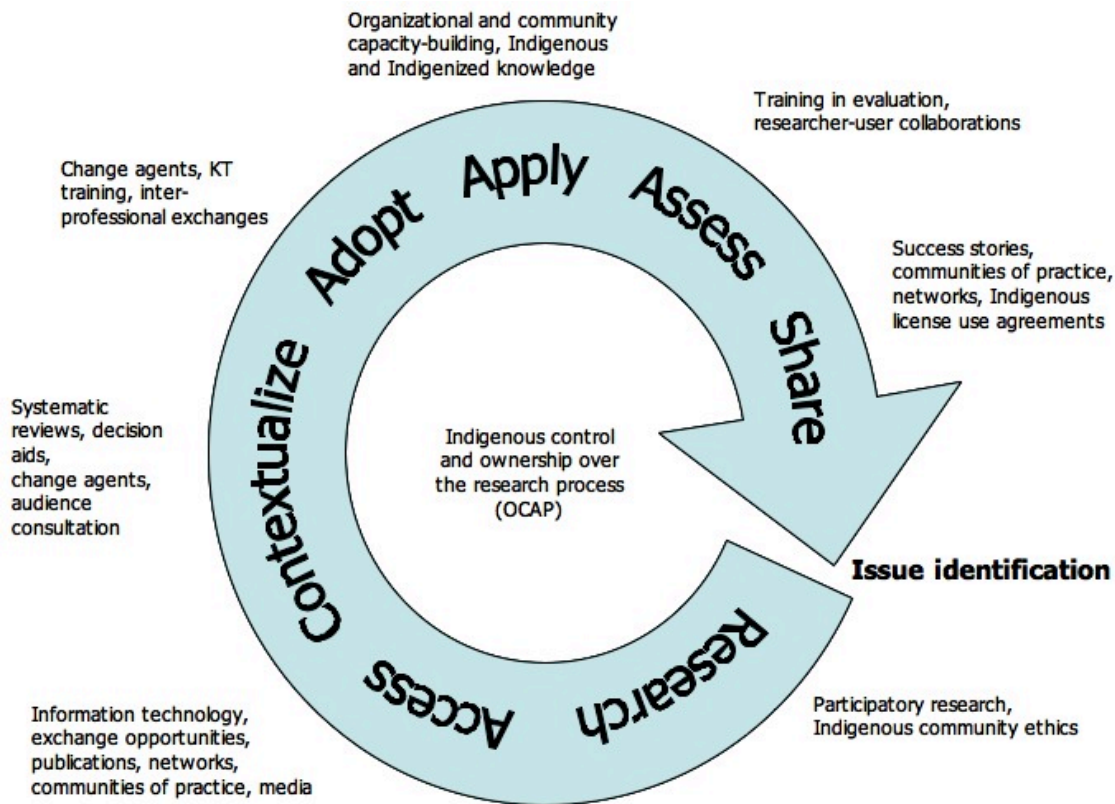

Figure 1. Promising KT practices in a cycle of research use

The Yukon's Arctic Health Research Network aims to build research capacity in the North. Knowledge translation can support this project. KT helps move research evidence into practice but more importantly, from a decision-making perspective, it can promote more meaningful decision-making and empower people through building capacity at the individual, community, and organizational levels. The prospect of more meaningful and useful decision-making through research use makes KT efforts worthwhile. But to be promising, practices must take into account the particular decision-making needs and situational context of northern groups. We invite those with an interest in Northern health issues to a dialogue on the ways by which research could be moved into practice in the North. We begin it by offering a few suggestions:

1.   KT nested in Indigenous knowledge

Certainly knowledge translation holds a different meaning in the context of Aboriginal cultures. If research knowledge is the central focus of western KT, from an Aboriginal peoples' perspective, research is understood as only one form of knowledge that helps bring on healthy outcomes. Developing a KT framework that is nested in Indigenous knowledge and the principles of OCAP would be valuable. Community-based work would be useful to identify and develop the most appropriate Indigenous KT practices.

2.   A call for more user-centered KT research

There is a lack of practice-focused participatory KT research exploring the particular decision-making contexts of Northerners. Geographic isolation, a lack of resources, and high staff turnover are some of the factors that influence health and healthcare systems in the North. Applied research on the ways to overcome these and other KT challenges would be particularly useful.

3.   Promoting a KT culture

In the last few years, knowledge translation has gained national and international momentum. Northerners should also benefit from learning of ways to improve health and healthcare outcomes through research use. The promotion of a KT culture among northern audiences begins by creating awareness and proficiency in (Indigenous) knowledge translation and understanding KT needs. Facilitated workshops promoting dialogue and learning would help towards this.

4.   Building capacity

Knowledge translation is a long-term endeavour. Developing and maintaining partnerships, in and outside the North, could help support this. Also, the possibility of building in-house capacity in terms of leadership and research skills has stimulated much interest from Aboriginal groups, health practitioners, and policymakers and planners alike. Again, facilitated workshops and training programs for Northern audiences could help develop these highly desired competencies.

5.   Promoting knowledge sharing

Three projects are suggested to promote knowledge sharing among northern groups. A first involves developing a northern-focused and publicly accessible online clearinghouse for KT information, tools, and communiqués. Such a website could also provide a forum to access and exchange information. A second involves facilitating writing opportunities for health professionals to document and share in published form their experiences and success stories. And a third consists of promoting networking events to encourage more productive face-to-face inter- and intra-professional interactions.

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Appendix 1. Selected KT resources

Canadian Health Services Research Foundation: Knowledge Transfer and Exchange
http://www.chsrf.ca/knowledge_transfer/index_e.php

Canadian Institute for Health Information
http://www.cihi.ca

Canadian Institutes of Health Research
http://www.cihr-irsc.gc.ca

Centre for Aboriginal Health Research
http://www.umanitoba.ca/centres/centre_aboriginal_health_research/

Centre for Health Services and Policy Research, University of British Columbia
http://www.chspr.ubc.ca/index.htm

Centre for Knowledge Transfer: Putting Research to Work
http://www.ckt-ctc.ca/English/home.htm

Chair on Knowledge Transfer and Innovation, Laval University
http://kuuc.chair.ulaval.ca/english/index.php

Cochrane Collaboration
http://cochrane.org

Cochrane Effective Practice and Organisation of Care Group
http://www.epoc.cochrane.org/en/index.html

Cochrane Musculoskeletal Group- Communicating the Evidence
http://www.cochranemsk.org/evidence/default.asp?s=1

Health-Evidence.ca
http://health-evidence.ca/

Health Research Transfer Network of Alberta
http://www.ahfmr.ab.ca/rtna/

Indigenous Health Research Knowledge Transfer Network
http://socserv.mcmaster.ca/ihrktn/

Indigenous Peoples Health Research Centre
http://www.iphrc.ca/

Institute of Aboriginal Peoples Health
http://www.cihr-irsc.gc.ca/e/8668.html

Joint Program in Knowledge Translation, University of Toronto
http://www.stmichaelshospital.com/research/kt.php

Knowledge Utilization Studies Program, University of Alberta
http://www.nursing.ualberta.ca/kusp/index.htm

National Aboriginal Health Organization
http://www.naho.ca/english/

National Collaborating Centre for Aboriginal Health
http://www.unbc.ca/nccah/

SEARCH Canada
http://www.searchca.net/users/folder.asp

The Need to Know Project, University of Manitoba
http://www.rha.cpe.umanitoba.ca/info.shtml