

Commentary

Knowledge Transfer within the Canadian Chiropractic Community. Part 2: Narrowing the Evidence-Practice Gap

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Introduction

This two-part commentary aims to provide clinicians with a basic understanding of knowledge translation (KT), a term that is often used interchangeably with phrases such as knowledge transfer, translational research, knowledge mobilization, and knowledge exchange.¹ Knowledge translation, also known as the science of implementation, is increasingly recognized as a critical element in improving healthcare delivery and aligning the use of research knowledge with clinical practice.² The focus of our com-

mentary relates to how these KT processes link with evidence-based chiropractic care.

In Part 1 of this series,³ we presented an overview of the barriers that impede successful KT in the chiropractic profession. Now in Part 2, we provide an overview of KT strategies followed by a discussion of relevant KT efforts in the Canadian chiropractic community. This discussion will lead to a long-term vision of KT for Canadian chiropractic with suggestions to where KT can be applied or where current efforts can be augmented. The overall goal

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of this article is to present potential strategies for successful KT implementation in order to reduce the gap between current best evidence and its application in chiropractic practice.

KT Strategies

A broad lexicon of terminology is used to describe various strategies to KT application.¹ In this section, we will present the most commonly used designations which include active and passive strategies, push/pull strategies, and exchange strategies. As well, we will consider several targeted strategies aimed at improving clinical practice outcomes. In all instances, proposed KT activities should be consistent with ethical principles and norms, social values, as well as legal and other regulatory framework. (More at: <http://www.cihir-irsc.gc.ca/e/39033.html>.)

Passive and Active Strategies

Passive strategies are those that do not require personal interaction with the end user,⁴ and include publication of peer-reviewed articles and distribution of clinical practice guidelines (CPGs). Although there are several peer-reviewed journals that publish research evidence relevant to chiropractic, quality can be highly variable and publication in high impact journals does not guarantee high quality.⁵ One result of this circumstance is that clinicians can locate journal publications to support almost any type of practice or challenge evidence that conflicts with their personal beliefs. Also, depending on the journal, there may be a long period of time between when knowledge is submitted versus published. Similarly, textbook content can rapidly become out-dated. These points emphasize that passive strategies may be insufficient at creating effective transfer of appropriate knowledge.

In contrast to passive strategies, active strategies are those that involve personal interaction with the end user.⁴ Conferences and workshops are examples that can provide opportunities for personal interaction, although these opportunities may be limited and depend on the motivation of the participant. Other opportunities for face-to-face interactions include educational outreach visits, local working groups, and interventions that combine approaches such as audit and feedback.⁶ Active strategies that include interaction between researchers and the end users of knowledge are thought to be more likely to yield positive results than passive strategies.⁶

Push / Pull Strategies

Knowledge translation strategies can also be characterized by whether they ‘push’ or ‘pull’ knowledge in the direction of the end user and by whether there is an exchange of knowledge between the end user and the researcher. ‘Push’ strategies (also known as ‘research-push’) include those in which knowledge generation is driven by the researcher toward end users. In contrast, strategies that ‘pull’ research (also known as ‘user-pull’) include those in which end users plan and implement strategies to pull knowledge from sources they identify as helpful in making clinical decisions.⁷

Exchange Strategies

Exchange strategies are those in which the process of knowledge generation includes interaction between the researchers and end users.⁷ These strategies are most consistent with the knowledge-to-action cycle described by Graham and colleagues⁸ which was presented in Part 1 of this commentary. In the KT cycle, interactions are critical, particularly in the early stages of intervention design which should take into account barriers against adoption of knowledge.

Targeted Strategies

Strategies also vary in terms of their targeted end user. For example, some interventions are targeted at clinicians while others target patients or health organizations (e.g., professional associations). Here, we offer an overview of 12 strategies (or interventions) that target professionals with the aim of improving clinical practice outcomes. Definitions for these strategies were adapted from the Rx For Change database maintained by the Canadian Agency for Drugs and Technologies in Health.⁹

1. *Distribution of educational materials*: This passive form of disseminating information is well known to clinicians. It refers to published or printed evidence-based recommendations for Clinical Practice Guidelines (CPGs), audio-visual materials, and electronic publications. Given the high prevalence and significant costs associated with back and neck pain, evidence-based CPGs and best evidence synthesis CPGs can be particularly useful where overuse and/or misuse of services exist. These CPGs aim to direct appropriate care based on the best available scientific evidence and broad consensus while promoting efficient use of resources.^{10,11} Guideline dissemination and

implementation strategies can encourage practitioners to conform to best practices and lead to improvements in care,¹²⁻¹⁵ but their impact is generally small.¹⁶

Pros: Generally available; can be accessed electronically or be printed; systematic reviews and CPGs are regularly updated; generally affordable to end users.

Cons: High volume of information; identifying credible sources can be challenging; sometimes difficult to appraise quality; not always applicable to own practice setting; small impact on practice.

2. *Mass media:* Mass media is sometimes used by our national or provincial associations and by the Canadian Chiropractic Protective Association (CCPA) to communicate with their members through newspapers, posters, leaflets, booklets, and the internet via official websites and other online outlets. The goal of these efforts is to inform clinicians of best practice options. As this information tends to also be accessible to the general public, there is evidence that media campaigns can improve practice outcomes (e.g., patients who stand to benefit are more likely to pursue appropriate care).¹⁷ The chiropractic profession also uses mass media to target patients using strategies such as television advertisements and segments.

Pros: Possible to reach a large number of people at once; may send powerful target messages.

Cons: Audience is constantly solicited (information overload); can choose to ignore messages; very resource intensive/high cost strategy; variable effect on practice.

3. *Educational meetings:* Another frequently used strategy involves attending conferences or lectures. More active strategies however involve participating in workshops or traineeships. Many conferences, such as the semi-annual Congress of the World Federation of Chiropractic (WFC) combine both lectures and hands-on workshops. The annual Association of Chiropractic Colleges Research Agenda Conference (ACC/RAC) may be attended by practising clinicians. Clinicians can earn continuing education credits. Content is geared toward academic and research focused conference delegates through posters, presentations and didactic workshops. The effect of educational meetings with respect to improving practice outcomes or congruence between

practice and evidence is uncertain,¹⁸ but probably results in small improvements.

Pros: Commonly used; a form of social gathering; hands-on workshops can be fun for participants; can be a source of revenue for organizers.

Cons: Educational meetings alone are not likely to be effective for changing complex behaviours;¹⁹ direct costs such as airfare and accommodation, and indirect costs such as lost clinic revenue can limit the reach of this strategy.

4. *Audit and feedback:* Audits are summaries of the clinician's performance over a set period of time. The information can be obtained from clinical records, computerised databases, or observations from patients. Clinical performance or what one does in practice (e.g., number of imaging studies ordered for a particular problem) can be compared with that of other colleagues. Feedback consists of recommendations for clinical action. At present, this approach is being used in several jurisdictions to improve surgical performance and to reduce adverse events.

Pros: An audit and feedback approach can be effective in improving professional practice; when it is effective, the impact is generally small but potentially important; the absolute effects of audit and feedback are more likely to be larger when baseline adherence to recommended practice is low.²⁰

Cons: Resource intensive; clinical databases collecting the same good quality information across practices is not widely available; need reliable methods for providing timely feedback.

5. *Educational outreach visits:* Educational outreach visits focus on the use of a trained person who meets with clinicians in their own clinic to provide information with the intent of helping improve their practice. The information given may include feedback on the performance of the clinician. The impact of such visits on practice outcomes is small, but potentially important.²¹

Pros: Can provide/receive immediate feedback that can be readily applied in practice; can establish trusting relationship; high satisfaction.

Cons: Resource intensive (e.g., requires trained individuals, takes time).

6. *Local consensus processes*: Another active strategy involves participating in a group discussion where clinicians meet with the aim to discuss a particular clinical problem and determine solutions together.

Pros: Provides for a safe learning environment; topics are highly relevant to practitioners; engaging.

Cons: Group may seek to involve those who think alike to avoid conflicting views; may not have access to content expert.

7. *Local opinion leaders*: Opinion leaders (OLs) are people who are seen as likeable, trustworthy, and influential by their peers. Because of their influence, it is thought that they may be able to persuade clinicians to use up-to-date evidence when managing patients.^{22,23} Towards this, the current Guideline Initiative in Canada has launched a survey that asks decision-makers within Canadian chiropractic to identify OLs who could help deliver key messages on best practices and CPGs to their peers across Canada.

Pros: Gaining recognition as useful strategy; OLs may be nominated by peers who already trust this individual; possible to use the same OLs for a number of strategies over a long period of time.

Cons: Resource intensive (e.g., identifying and training opinion leaders).

8. *Multifaceted*: Multifaceted interventions are any combination of two or more professional, organisational, financial, or regulatory interventions designed to improve patient care. Several examples of this strategy, which aim to create multidisciplinary or interdisciplinary triage and care, are underway in many provinces.

Pros: Can target end users in multiple ways or several end users at once (e.g., practitioners, patients, decision-makers).

Cons: Unclear which combination of interventions (e.g. number, order, dosage) is most effective.

9. *Patient-mediated*: Patient-mediated strategies involve collecting new clinical information (not previously available) directly from patients and providing these data to clinicians (e.g. Oswestry Disability Index). It also includes strategies aimed at favouring a shared decision making process.

Pros: Patient feedback can positively influence clinician decisions; engaging patients in their care aligns with the 'patient-centred' model of care; this strategy is useful when grey zones exist in the clinical decision making process as it is often the case for musculoskeletal conditions.

Cons: Clinicians with a paternalistic approach may feel threatened by patient knowledge; acquiring additional information from patients requires more time.

10. *Reminders*: This strategy aims to prompt clinicians to recall information, ideally at the time they make a decision about patient care. There is moderate quality evidence that computer generated printed reminders result in significant improvement to professional practices, with a median improvement of processes of care of 7.0% (interquartile range = 3.9% to 16.4%).²⁴

Pros: Provides timely information to clinicians during clinical care (i.e., helps one reflect on habitual practice).

Cons: Requires electronic patient health records programmed to deliver timely reminders; resource intensive.

11. *Tailored interventions*: Interventions are developed (tailored) based on previously identified barriers and facilitators toward adopting best practices. Interventions are guided by the findings from interviews or surveys conducted among clinicians (sometime patients or decision-makers as well).

Pros: Chances of overcoming important barriers are increased (e.g., practitioner, patient, practice, system level); better rationale for the recommended strategy; theory-based interventions help understand why the strategy worked (or not) in a particular context.

Cons: Time intensive to develop; resource intensive.

12. *Knowledge brokering*: A knowledge broker is an individual whose job is to mobilize relevant knowledge to the appropriate users and to facilitate the translation of that knowledge into practice.²⁵ According to a paper in the journal *Science*,²⁶ knowledge brokering is an emerging career option with a knowledge broker described as some-

one who “...sits in between those who create knowledge (i.e. the researchers) and those who use knowledge, such as policy-makers, the general public, or people working in the health domain”. Knowledge brokers try to bridge the gap that can exist between those two worlds and build connections.²⁶ Although there are no knowledge brokers currently in chiropractic, they are becoming increasingly prevalent in the rehabilitation sciences. For example, at the University of British Columbia, there is a knowledge broker in the Department of Physical Therapy, whose job is to promote and facilitate evidence-based practice, to increase awareness of activities and opportunities in physical therapy, to communicate with relevant stakeholders, and to bridge the gap between research and practice (<http://physicaltherapy.med.ubc.ca/physical-therapy-knowledge-broker/>).

Pros: Content expert can coordinate a range of relevant KT strategies, create learning opportunities, and help narrow the gap between researchers, practitioners and stakeholders.

Cons: Requires individuals with specialized training who are cognizant of the particularities of the health discipline; type of training is currently ill-defined; costly.

Evaluating the success of KT Strategies

While choosing the correct KT strategy is important, equally critical is measuring its effect. Early steps to evaluating any KT strategy include identifying stakeholders in the process and determining specific objectives and appropriate outcome measures. In evaluating any KT strategy, the following questions should be asked and answered:

- 1) Can the KT interventions be delivered as planned?
- 2) Do the proposed interventions change clinical practice (e.g., increase compliance with recommended care)?
- 3) Do the interventions improve outcomes important to patients' health (e.g., level of pain, mobility, disability)?
- 4) Do the interventions result in cost saving?

These outcomes should be closely aligned with the objectives of the KT strategy. For example, increased implementation of clinical care pathways can be measured by

reviewing patient charts or a quality assurance database. Similarly, substitute measures may also be used but are limited by their association with the actual outcome(s) of interest such as behavioural simulation (e.g., solving clinical vignettes), a change in process of care (e.g., improved level of knowledge, capability or intention to perform the desired behaviour), tracking the number of attendees at conferences or quantifying the number of professional development courses held and attendees. In addition, it may be relevant to focus on economic outcomes such as tracking income relating to patents, technology transfer (licenses) and/or commercialization of chiropractic initiatives in industry. These and other unique metrics could be devised to directly reflect the priorities of the profession and the nature of the information/knowledge being translated. Stakeholders within the profession have an important role in determining the most appropriate metrics that best reflect these goals.

Current KT efforts and opportunities in Canada

There are currently several ongoing KT efforts within the chiropractic profession at various stages of implementation. Most of these efforts focus on advancing best practices within the profession. Like any KT effort, the success of translating new knowledge into practice not only depends on choosing the correct KT strategy, but also on ‘buy in’ from all levels of the chiropractic profession, including clinicians, researchers, policy-makers, educational institutions, and professional associations. With that in mind, the following examples of KT efforts need your help and are ready for your involvement.

1. *The E-BASE study:* Launched in late 2013, over 7000 Canadian chiropractors have received an invitation from the Canadian Chiropractic Association (CCA) and the Canadian Federation of Chiropractic Regulatory and Educational Accrediting Boards (CFCREAB) to complete an online survey regarding their knowledge and beliefs towards evidence-based clinical practice (EBCP). This survey of Canadian chiropractors aims to: 1) assess current level of knowledge and attitudes toward evidence-based clinical practice, and 2) assess the ‘impact’ of previous CPGs created by the CCA and CFCREAB. This survey is important for helping members of the profession better understand what clinicians think of EBCP in general and if they are familiar with existing CPGs. Ultimately, information gathered regarding attitudes towards evidence

based chiropractic practice and familiarity with existing CCA guidelines will help determine how best to convey information on best practices to clinicians.

2. *The CCA-CFCREAB Guideline on Adult Neck Pain:* An update of the CCA Guideline for management of Adult Neck Pain was recently published.²⁷ The Guideline Initiative (see below) interviewed chiropractors and decision makers in the profession to help understand barriers and facilitators to adopting this new guideline. A number of KT strategies are being developed to help clinicians make informed decisions regarding the management of patients with neck pain.

3. *The Guideline Initiative:* The new website of the CCA Guideline Initiative, housed under the CCA, will be up and running in August 2014. Please visit: <http://chiropractic.ca/guidelines-best-practice/>. This website is an important tool to bridge the gap between knowledge and practice. Target audiences are clinicians, their patients, and leaders/decision-makers in the chiropractic profession. Each section will include up-to-date information to help make informed decisions about patient care. Types of information and activities being considered for the new website include:

- a repository of evidence-based chiropractic CPGs, associated tools, job aids, and shared decision making tools.
- links to credible sources of information on topics of interest to practitioners, patients, and leaders/decision-makers.
- a ‘virtual clinic’ (i.e., case-based learning online) and webinars to ease understanding of new CPGs and related tools.
- short videos on new and existing research conducted by chiropractic researchers; these will be delivered in a format and in a style that is accessible to the target audience.

4. *University-Based Working Groups:* University-based chiropractic working groups involve scientists, graduate students, clinicians, and representatives from provincial and national chiropractic organizations. The mandate of such groups is to promote awareness of each other’s activities and maximize collaborative potential for chiropractors with university affiliations. The first group began meeting quarterly at McMaster University in 2009, and is supported by the CCA and Ontario Chiropractic Association.²⁸ Since the inception of the initial group,

new groups have formed with the support of the CCA that are affiliated with the University of Manitoba, the University of Regina, and universities in the Toronto region. Group meetings facilitate the assessment of the general capacity for chiropractic research at specific institutions. The diverse backgrounds of working group members also allow meetings to serve as KT forums, and opportunities to brainstorm future collaborative initiatives. For institutions with a limited chiropractic faculty presence, these groups also serve as a vehicle to engage with local and regional chiropractors with no direct institutional affiliation and perhaps a limited research background. Such “grassroots” participation is vital to the development of clinically-driven research questions that are of particular importance and relevance to everyday practice. Including representatives from provincial and national chiropractic organizations in group meetings and activities also facilitates activities aimed at disseminating the research knowledge to organizational members, as well as local and regional policy-makers. Employing common video conferencing tools can provide access to a broader scope of members to increase the impact of this initiative. For a list of existing working groups and their respective contact information, please contact Dr. Frances LeBlanc: fleblanc@chiropracticcanada.ca.

5. *The Practice-based Research Network:* The Practice-Based Research Network (PBRN) evolved from the efforts of members of the Guideline Initiative to help bridge the gap between practicing chiropractors, consumers, researchers, and decision-makers. The aim of the PBRN is to engage these groups to improve the uptake of best practices to improve the quality and safety of patient care, primarily in the management of musculoskeletal conditions, and to standardize reporting of patient outcomes in Canada.²⁹ A planning meeting will be held at the end of 2014 to facilitate a partnership between practicing chiropractors, patient representatives, researchers, and decision-makers to discuss the formation and development of the first Canadian chiropractic PBRN. The aim of this meeting is to provide expertise and strategies that can be applied in the creation of an organizational infrastructure to facilitate the conduct of practice-based research within a network of clinics. Practicing chiropractors are encouraged to contact Heather Owens at howens@chiropractic.ca.

6. *Regional Chiropractic Groups:* There are groups

of chiropractors from specific geographic regions across Canada that host regular or semi-regular meetings. The meetings may feature a guest speaker or have a theme to guide discussions. Meetings frequently occur over meals creating an informal environment and increased sense of camaraderie. Some of the groups have an informal invitation or announcement of meetings through an e-mail list. Other groups have a formal hierarchy with executive, clearly defined member lists, websites, newsletters, membership dues, and mission statements. Examples of components from mission statements include: serve as a representative membership organization to the chiropractic profession in the region; provide local leadership within the profession; create local educational opportunities for the region's chiropractors; facilitate fellowship within the local profession. Regardless of how or when they formed, these groups are an opportunity for chiropractors who may feel isolated in private outpatient clinical practice to engage with other members of the profession.

For a list of regional chiropractic groups known to exist and their respective contact information, or if your region has a local chiropractic society or group that you would like others to be made aware of to engage fellow chiropractors in informal or formal KT experiences, please contact Dr. Frances LeBlanc: fleblanc@chiropracticcanada.ca. You may also use this contact information if your region does not have a group and you wish to retrieve a template for how to create a group.

7. Local Opinion Leaders: The Guideline Initiative has recently surveyed chiropractic organizations in Canada and members of the chiropractic specialty colleges to recommend up to three OLs. From time to time, OLs may be asked to present material developed by the Guideline Initiative in continuing education activities within respective jurisdictions (e.g., conferences, workshops, seminars, webinars, online educational modules) to promote evidence based practice. OLs may be used along with other strategies, such as reminders, audit and feedback, and distributing educational materials. A 10-member selection committee will recommend a small group of individuals from the list of potential OLs who will be invited to participate in a training session to help them become more effective communicators and leaders when interacting with colleagues and other healthcare professionals. Readers of this journal may contact Heather Owens to inquire about OLs in their province: howens@chiropractic.ca.

Long-term KT vision for the Canadian Chiropractic community

In this section, we present some specific suggestions for new initiatives that may help to enhance evidence-based chiropractic care through the mobilization of relevant knowledge.

1. *Continuing Education:* Continuing Education (CE) intends to update knowledge and help maintain/develop professional competencies of clinicians. While attendance of educational meetings such as conferences, workshops, and interactive meetings is generally effective for improving both appropriateness of care and patient-important health outcomes, its effect size tends to be small.³⁰ As previously discussed, this may be due in part to the fact that educational strategies are often limited by a unidirectional flow of knowledge. We suggest that CE should not be simply a transfer of information; it should aim to improve overall management of chronic conditions and increase focus on health care outcomes and performance.³¹ Long-term goals should involve the maintenance of licensure/certification by focusing on demonstration of improved practice; multiple media, multiple techniques of instruction, and multiple exposures to content are suggested to meet instructional objectives intended to improve clinical outcomes.^{32,33}

To help address the clinical care gap, we propose the creation of a national CE program. We suggest establishing a working group composed of representatives from academic institutions (e.g., CMCC, UQTR), the CF-CREAB, the Education Council (CCEC), the Education Board (CCEB), the CCA, the CCPA, Chiropractic Specialties, and the Canadian Chiropractic Research Foundation (CCRF). The aim of this working group would be to explore challenges related to the delivery and the quality of CE in chiropractic in Canada. Developing consistency in CE standards could be eased by the adoption of a common framework similar to the one used by the Federation of Chiropractic Licensing Boards in the US (i.e., PACE: Providers of Approved Continuing Education). A centralized CE approval process exists in many other health professions. Ultimately, this could lead to the creation of a National CE program whereby jurisdictions and teaching institutions would collaborate to provide high quality postgraduate CE training. Such a strategy aligns with recent recommendations to create a supportive environment, redesign educational delivery systems, provide a

robust body of evidence-based knowledge, and engage clinician-learners.³⁴

2. *Knowledge Brokering*: To facilitate interactions between researchers and clinicians and other relevant stakeholders (leaders, opinion-makers, policy-makers), we propose that a knowledge broker position be established. The knowledge broker would be involved with ongoing KT efforts in Canada and would help in the organization and implementation of additional efforts. As well, they would evaluate and synthesize knowledge related to evidence-based practice and ensure open and effective two-way communication of knowledge with end users. At present, these activities are currently dispersed among many parties. While a network of people with related interests is critical to KT success, a dedicated knowledge broker would undoubtedly improve co-ordination of these activities.

Final thoughts

The increased adoption of EBCP by the chiropractic profession is foundational to the goal of mainstream integration of chiropractic services into Canada's health delivery system.³⁵ This is reflected by the vision of the CCA: '*Chiropractors will be an integral part of every Canadian's healthcare team by 2023.*' In order to realize this goal, the chiropractic profession must demonstrate its unwavering commitment to leadership within the evolving Canadian health care system by fostering a strong knowledge creation initiative.

One of the greatest challenges to improving health care is the translation of high quality evidence into clinical practice.³⁶ Without strategies in place to facilitate this goal, the chiropractic profession will be challenged to become further integrated into the Canadian healthcare system.

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.

Alvin Toffler

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