Knowledge Translation in Health Care: Moving from Evidence to Practice

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CIHR IRSC
Canadian Institutes of   Instituts de recherche
Health Research   en santé du Canada

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Foreword

Improving research dissemination and uptake in the health sector: beyond the sound of one hand clapping

Jonathan Lomas

Introduction

Science is both a collection of ideological beliefs and an agency for liberation, it substitutes democracy for political and religious authority. Demanding evidence for statements of fact and providing criteria to test the evidence, it gives us a way to distinguish between what is true and what powerful people might wish to convince us is true [1].

The above quote provides a justification for concern about improving the link between research and decision making—good information is a tool in the maintenance of democracy and a bulwark against domination of the diffuse broad interests of the many by the concentrated narrow interests of the powerful few. Current concern with evidence-based decision making (EBDM) is about improving the quantity, quality, and breadth of evidence used by all participants in the health care system: legislators, administrators, practitioners, industry, and, increasingly, the public. Better dissemination and uptake of health research is integral to EBDM. Current failings in this area have more to do with unrealistic expectations between the various decision-maker audiences and researchers than they are with unavailability of research or an absent need for it in decision making. Understanding the roots of unrealistic expectations on both sides helps to point the way to improved dissemination and uptake of health research.

Understanding the roots of unrealistic expectations

There appear to be at least four areas of misunderstanding between researchers and decision makers:

1. *Research and decision making as processes not products*

There is a tendency for decision makers to treat the research community as a retail store. They interact only when they wish to acquire the product of many years of conceptualization and effort emerging from the research team's process of investigation. Thus, the research is often of limited relevance because the constraints, priorities, and concerns of the decision maker were neither communicated nor sought out early enough and often enough to be incorporated into the conduct of the research. Similarly, researchers tend to treat decision making as an event rather than a process. Thus, they often arrive too late with their findings and try to insert them into the decision-making process after the problem has been formulated, feasible options delineated, and causal models incompatible with their approach adopted. The multiple stages of the decision-making and research processes argue for far more ongoing communication of priorities, approaches, choice points, and constraints between the two communities.

2. *The political and institutional context of decision making*

Trained as rational scientists, most researchers confuse their desire for *rational* decision making with the reality of politically and institutionally constrained *sensible* decision making. Researchers therefore underestimate the importance of values in decision making and overestimate the role of their "facts." These facts are contestable in the decision-making environment, and vie with other sources of information and become transformed in the hands of various interested (stakeholders) and disinterested (media) purveyors of information for decision making. Receptivity to "facts" from research is based on system values as expressed through the preconceived notions of the participants, predilictions of those with the decision-making power, and the precedents of the institutions responsible for the decision process. Failure of researchers to understand this political and institutional environment leads to naive expectations regarding the adoption of their findings; over-commitment to *rational* decision making may even lead to wilful disregard of these political and institutional realities.

3. *Decision makers' views and expectations of research communities*

Researchers, especially those based in universities, organize around disciplines rather than issues. Integrated knowledge addressing a specific problem is therefore a rare commodity. The desire of decision makers for one-stop-shopping to acquire "trans-disciplinary" relevant knowledge is often frustrated by these disciplinary divisions. Furthermore, the historical incentive in

universities is to engage in discovery research (designed to serve future, often as yet unspecified, needs) more than applied research (designed to address current perceived needs). To the extent that most decision makers confront current problems, there is a mismatch between where researchers spend their time and where decision makers would wish them to spend their time.

Although some rebalancing of university effort is needed toward more applied research, there is a danger that decision makers, in their haste to acquire research for their decision making, may divert excessive resources away from discovery research. Not all research is (or should) be dedicated to serving today's decision makers. At least some capacity has to be dedicated to discovery research that produces the feedstock of methods, new approaches, and innovations for future applied research.

4. *Researchers' views and expectations of decision-making communities*

Researchers tend to treat decision makers as a homogeneous community. Many fail to discriminate between (and do not tailor dissemination of findings to) at least four audiences consisting of different types of individuals with different needs from research, different preferred formats for its dissemination, and different degrees of skill and motivation in extracting findings from the research community.

Legislative decision makers—politicians, bureaucrats, and various interest groups—are more likely to use research and analysis to form policy agendas (e.g., should health consequences be an integral part of debates on unemployment?) or to justify already chosen courses of action (e.g., how many deaths per year can we claim to have averted with gun controls?) than they are to engage in open-ended searches for the most scientifically valid solution to a problem. Health policy analysis is of most use to them. Decision making at this level is more about policy ideas, about ways of framing issues and defining manageable problems than it is about selecting solutions. Research information communicated via dense and jargon-laden publications is less appropriate for this busy audience than are person-to-person or brief memo formats.

Administrative decision makers—program managers, hospital executives, regional administrators, insurers, and board members—may use the more applied health services research and sometimes clinical research to make decisions, such as facility location, program design, human resource mix, budget allocations, and quality improvement strategies. Often specialists in some aspect of health care, they wish to make more instrumental use of health research and may establish ongoing contacts with particular researchers to reduce search time and assure reliability of information. Synthesized knowledge around a concrete issue, provided within the time

frame of the decision process, is of most use to them, either in written form or via workshops and seminars or their personal contacts.

Clinical decision makers—individual practitioners, specialty and professional society officials, and expert panel members—are concerned with specific questions of patient selection criteria, schedules for preventive regimens, safely delegable acts, effective monitoring, and disciplinary procedures. Clinical research is of most interest to them. With perhaps the most circumscribed needs of any audience, their clinical information needs are increasingly served by mediating organizations, such as the Cochrane Collaboration or by journals dedicated to the synthesis of clinically relevant knowledge. Nevertheless, the time constraints and informal communication channels of this audience still require attention to the use of innovations in dissemination, such as local opinion leaders and peer bench-marking.

Industrial decision makers—pharmaceutical companies, software and device manufacturers, and venture capitalists—are interested in potentially profitable products and can be distinguished from the other audiences by their high degree of motivation to "pull" marketable findings from researchers. Consequently, this audience most obviously raises the ethical and allocational question of proprietary-oriented versus publicly oriented (or profit-oriented versus need-oriented) objectives for health research. Although clinical and biomedical research has historically been of most interest to them, health services research with software or other system implications is of increasing importance to this audience. Because of their high degree of motivation in finding marketable products, the formats for dissemination can be closer to "raw" research findings than for other audiences.

The failure of many researchers to distinguish between the needs and preferred dissemination formats of these audiences has led them to an inappropriate "one-size-fits-all" journal publication approach to dissemination of research findings.

Conclusion

Achieving improved dissemination and uptake of health research will depend on interested applied researchers, committed decision makers, and both research sponsors and universities willing to consider new ways of doing business. This discussion document identifies four elements in a campaign to achieve this improvement:

1. An umbrella message from a national level that communicates a cultural change toward more conduct of relevant, good quality research and

greater attention to the application of findings from such research to decision making.

2. New structures to improve the opportunities for ongoing fruitful communication between researchers and decision makers, and to concentrate both applied research production and research receptor skills as a critical mass in universities and decision-making organizations, respectively.

3. New activities and processes:
    i. By researchers to synthesize and disseminate their work in a way that is more sensitive to the needs of their target audiences,
    ii. By decision makers to both receive and apply research findings, as well as to communicate audience-specific priorities,
    iii. By universities to reward instead of penalize employees interested in applied research, and
    iv. By research sponsors to both encourage greater relevance in funded research and to recognize issue-specific bodies of knowledge as an important unit of research production and transfer.

4. New human resource approaches to give both decision makers and researchers a better understanding of each others' environments and to produce new categories of personnel (e.g., knowledge brokers) skilled in bridging the not insignificant cultural gap between the two communities.

August, 1997

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1 Tesh SN. *Hidden Arguments: Political Ideology and Disease Prevention Policy.* London: Rutgers University Press; 1989, p. 167.

Preface

In 1997, Jonathan Lomas wrote a commentary describing the gap between research and decision making and postulated why this may occur. He described areas of misunderstanding between researchers and decision makers that may contribute to this gap and suggested that improved communication across these groups was necessary to enhance knowledge uptake. We reproduced part of his analysis as Foreword to outline challenges in knowledge implementation that were identified at that time. He went on to implement many of the ideas emerging from his work during his 1998–2007 tenure as the inaugural Chief Executive Officer of the Canadian Health Services Research Foundation.

This book attempts to demonstrate the progress that has been made in implementing knowledge in health care and describes strategies to bridge the gap between knowledge and action. We believe that both the science and practice of knowledge implementation have advanced in the last decade, and efforts in these areas are growing exponentially. This book highlights some of these efforts, provides a framework for implementation activities, and demonstrates future areas of research, where gaps still exist.

Section 1
Introduction

1.1 **Knowledge to action: what it is and what it isn't**

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KEY LEARNING POINTS

- Gaps between evidence and decision making occur across decision makers including patients, health care professionals, and policy makers.
- Knowledge translation (KT) is the synthesis, dissemination, exchange, and ethically sound application of knowledge to improve health, provide more effective health services and products, and strengthen the health care system.

Health care systems are faced with the challenge of improving the quality of care and decreasing the risk of adverse events [1]. Globally, health systems fail to optimally use evidence, resulting in inefficiencies and reduced quantity and quality of life [2,3]. The science and practice of knowledge translation (KT) can answer these challenges. The finding that providing evidence from clinical research is necessary but not sufficient for providing optimal care delivery has created interest in KT, which we define as the methods for closing the knowledge-to-action gaps.

What is knowledge translation?

Many terms are used to describe the process of putting knowledge into action [4]. In the United Kingdom and Europe, the terms *implementation science* and *research utilization* are commonly used in this context. In the United States, the terms *dissemination* and *diffusion, research use, knowledge transfer,* and *uptake* are often used. Canada commonly uses the terms *knowledge transfer* and *exchange.* In this book, we use the terms *knowledge translation* (KT) and *knowledge to action* interchangeably. For those who want a formal definition of KT, the Canadian Institutes of Health Research (CIHR) defines

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KT as "a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products and strengthen the healthcare system." This definition has been adapted by the U.S. National Center for Dissemination of Disability Research and the World Health Organization (WHO). The move beyond simple dissemination of knowledge to actual use of knowledge is the common element to these different terms. It is clear that knowledge creation, distillation, and dissemination are not sufficient on their own to ensure implementation in decision making.

Some organizations may use the term *knowledge translation* synonymously with *commercialization* or *technology transfer*. However, this narrow view does not consider the various stakeholders involved or the actual process of using knowledge in decision making. Similarly, some confusion arises around continuing education versus KT. Certainly, educational interventions are a strategy for knowledge implementation, but it must be kept in mind that the KT audience is larger than the number of health care professionals who are the target for continuing medical education or continuing professional development. KT strategies may vary according to the targeted user audience (e.g., researchers, clinicians, policy makers, public) and the type of knowledge being translated (e.g., clinical, biomedical, policy) [2].

Why is KT important?

Failure to use research evidence to inform decision making is apparent across all key decision-maker groups, including health care providers, patients, informal carers, managers, and policy makers, in developed and developing countries, in primary and specialty care, and in care provided by all disciplines. Practice audits performed in a variety of settings have revealed that high-quality evidence is not consistently applied in practice [5]. For example, although several randomized trials have shown that statins can decrease the risk of mortality and morbidity in poststroke patients, statins are considerably underprescribed [6]. In contrast, antibiotics are overprescribed in children with upper respiratory tract symptoms [7]. A synthesis of 14 studies showed that many patients (26–95%) were dissatisfied with information given to them [8]. Lavis and colleagues [9] studied eight health policy-making processes in Canada. Citable health services research was used in at least one stage of the policy-making process for only four policies; only one of these four policies had citable research used in all stages of the policy-making process. Similarly, evidence from systematic reviews was not frequently used by WHO policy makers [10]. And, Dobbins and colleagues observed that although

systematic reviews were used in making public health guidelines in Ontario, Canada, policy-level recommendations were not adopted [11].

Increasing recognition of these issues has led to attempts to effect behavior, practice, or policy change. Changing behavior is a complex process that requires the evaluation of the entire health care organization, including systematic barriers to change (e.g., lack of integrated health information systems) and targeting of those involved in decision making, including clinicians, policymakers, and patients [2]. Effort must be made to close knowledge-to-practice gaps with effective KT interventions, thereby improving health outcomes. These initiatives must include all aspects of care, including access to and implementation of valid evidence, patient safety strategies, and organizational and systems issues.

What are the KT determinants?

Multiple factors determine the use of research by different stakeholder groups [12–16]. A common challenge that all decision makers face relates to the lack of knowledge-management skills and infrastructure (the sheer volume of research evidence currently produced, access to research evidence, time to read, and skills to appraise, understand, and apply research evidence). Better knowledge management is necessary, but is insufficient to ensure effective KT, given other challenges that may operate at different levels [16], including the health care system (e.g., financial disincentives), health care organization (e.g., lack of equipment), health care teams (e.g., local standards of care not in line with recommended practice), individual health care professionals (e.g., knowledge, attitudes, and skills), and patients (e.g., low adherence to recommendations). Frequently, multiple challenges operating at different levels of the health care system are present. KT interventions and activities need to keep abreast with these challenges and changes in health care.

The knowledge-to-action framework: a model for KT

There are many proposed theories and frameworks for achieving knowledge translation that can be confusing to those responsible for KT [17–21]. A conceptual framework developed by Graham and colleagues, termed the knowledge-to-action cycle, provides an approach that builds on the commonalities found in an assessment of planned-action theories [4]. This framework was developed after a review of more than 30 planned-action theories that identified their common elements. They added a knowledge creation process to the planned-action model and labeled the combined models the
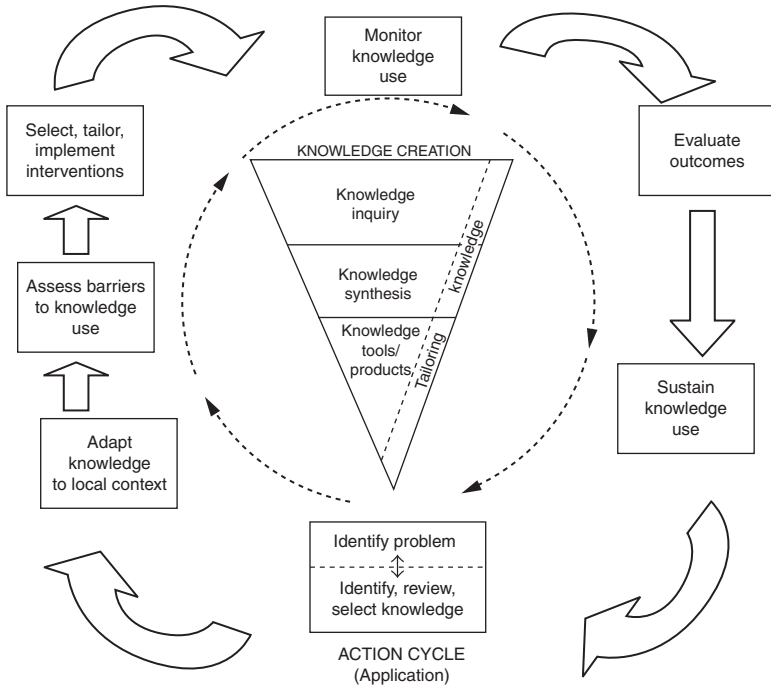
Figure 1.1.1 The knowledge-to-action framework.

knowledge-to-action cycle. The CIHR, Canada's federal health research funding agency, has adopted the cycle as the accepted model for promoting the application of research and as a framework for the KT process.

In this model, the knowledge-to-action process is iterative, dynamic, and complex, concerning both knowledge creation and application (action cycle) with fluid boundaries between creation and action components. Figure 1.1.1 illustrates the knowledge creation funnel and the major action steps or stages comprising the knowledge-to-action model.

Knowledge creation

Knowledge creation, or the production of knowledge, consists of three phases: knowledge inquiry, knowledge synthesis, and knowledge tools and/or product creation. As knowledge is filtered or distilled through each stage of the knowledge creation process, the resulting knowledge becomes more refined and potentially more useful to end users. For example, the synthesis stage

brings together disparate research findings that may exist globally on a topic and attempts to identify common patterns. At the tools/products development stage, the best quality knowledge and research is further synthesized and distilled into a decision-making tool, such as practice guidelines or algorithms.

The action cycle

Seven action phases can occur sequentially or simultaneously, and the knowledge phases can influence the action phases at several points in the cycle. At each phase, multiple theories from different disciplines can be brought to bear. Action parts of the cycle are based on planned-action theories that focus on deliberately engineering change in health care systems and groups [17,18]. Included are the processes needed to implement knowledge in health care settings, namely, identification of the problem; identifying, reviewing, and selecting the knowledge to implement; adapting or customizing knowledge to local context; assessing knowledge use determinants; selecting, tailoring, implementing, and monitoring KT interventions; evaluating outcomes or impact of using the knowledge; and determining strategies for ensuring sustained knowledge use. Integral to the framework is the need to consider various stakeholders who are the end users of the knowledge that is being implemented.

In this book, we attempt to provide an approach to the science and practice of KT. We will describe the roles of synthesis and knowledge tools in the knowledge creation process, as well as present key elements of the action cycle and outline successful KT strategies targeted to relevant stakeholders including the public, clinicians, and policy makers. Each chapter was created following a systematic search of literature and appraisal of individual studies for validity. Gaps in the literature will be identified; the science of KT is a relatively new field, and we will attempt to reflect this by highlighting future areas of research.

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