UNIVERSITÉ DU QUÉBEC À MONTRÉAL

KNOWLEDGE TRANSFER IN THE CONTINUING PROFESSIONAL DEVELOPMENT OF PHYSICIANS: CHARACTERISTICS OF CONTEXT, ROLES AND RESPONSIBILITIES - A COMPARATIVE ANALYSIS OF CANADA, THE UNITED STATES AND ENGLAND

THESIS PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE MAÎTRISE EN ADMINISTRATION DES AFFAIRES

BY
MIREILLE PATOINE

JUNE 2012

UNIVERSITÉ DU QUÉBEC À MONTRÉAL

TRANSFERT DE CONNAISSANCES DANS LA FORMATION MÉDICALE CONTINUE DES MÉDECINS : CARACTÉRISTIQUES DU CONTEXTE, RÔLES ET RESPONSABILITÉS - UNE ANALYSE COMPARÉE DU CANADA, DES ÉTATS-UNIS ET DE L'ANGLETERRE

MÉMOIRE PRÉSENTÉ COMME EXIGENCE PARTIELLE POUR
LA MAÎTRISE EN ADMINISTRATION DES AFFAIRES

PAR

MIREILLE PATOINE

JUIN 2012

I dedicate this thesis to my husband-to-be, James, who has continually supported, encouraged, and motivated me throughout this process (even when I could not motivate myself).

The completion of this thesis will, undoubtedly,
be one of the greatest wedding gifts you (or I) will receive.

ACKNOWLEDGEMENTS

I would like to acknowledge all of the individuals who made this thesis possible.

Firstly, thank you to my research director, Professor Mehran Ebrahimi, who gently guided me along and worked around my difficult schedule and life changes. Your advice and support have been greatly appreciated throughout this process.

I would also like to thank my family, friends, and employers, who continually supported me for two years while I spoke incessantly about continuing medical education-related issues and the adventures of the thesis-writing process! You have always been there for me, even just to listen and commiserate.

You mean the world to me.

Lastly, I thank all of the interview participants in Canada, the United States and England, who took an hour of their time to speak with me about their views on the continuing medical education system. I learned an invaluable amount through our conversations and I hope to work with you in the future.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

RÉSUMÉ

Objectif : Cette étude avait deux objectifs principaux de recherche: de décrire comment les éléments contextuels agissent sur le processus de transfert et de translation des connaissances dans la formation médicale continue (FMC) et le développement professionnel continu (DPC) ainsi que les intervenants de ce processus, et d'expliquer comment ces éléments diffèrent au Canada, aux États-Unis et en Angleterre. **Sujets :** Des techniques d'échantillonnage raisonné et de boules de neige ont été utilisées pour recruter des participants aux entrevues. Seize participants ont été sélectionnés au final. **Méthode :** Seize entrevues semi-structurées en profondeur ont été menées en personne ou au téléphone avec les participants sélectionnés, en utilisant un guide d'entretien basé sur la littérature sur le transfert et la translation des connaissances, la formation médicale continue, le développement professionnel continu, et les théories d'apprentissage pour adultes. **Résultats :** Les participants aux entrevues ont mentionné un certain nombre de facteurs liés au processus de transfert et la translation des connaissances. Ceux-ci ont été répartis en cinq thèmes: La FMC / DPC comme champ et profession; la « business » de la FMC / DPC, la nouvelle orientation de la FMC / DPC; les nouveaux formats utilisés dans la FMC / DPC, et l'impact des éléments contextuels sur les processus de FMC / DPC. Quatre catégories ont été utilisées pour analyser l'impact spécifique des éléments contextuels sur processus de transfert et la translation des connaissances : *source*, *contenu*, *médium*, et *utilisateur*. Les milieux économiques, politiques, éthiques, réglementaires, socio-culturels et technologiques se chevauchaient tous et étaient reliées entre eux parmi et entre les pays étudiés. En termes de *sources* de connaissances, les dimensions éthiques et réglementaires ont été particulièrement influents dans les trois pays, mais particulièrement aux États-Unis en raison de la perspective axée sur les affaires et l'entrepreneuriat spécifiques à ce pays. Le *contenu* de la FMC / DPC et la focalisation croissante sur la qualité de la FMC / DPC étaient liés à des dimensions économiques, éthiques et réglementaires dans les trois pays étudiés. Les facteurs technologiques, économiques et socio-culturels touchaient directement les *médias* et les formats disponibles en FMC / DPC dans les trois pays de manière égale. Les aspects éthiques, réglementaires et politiques étaient les dimensions importantes concernant la catégorie *d'utilisateurs* des connaissances, avec un accent sur les questions de réglementation aux États-Unis et la pression politique en Angleterre. **Conclusion:** Le processus de transfert et la translation des connaissances en FMC / DPC implique un certain nombre de chevauchement des éléments contextuels qui agissent sur les processus de FMC / DPC spécifiques à chaque pays différemment. Ces éléments de contexte peuvent être considérés à la fois comme des obstacles et / ou come des facilitateurs au processus de transfert et de translation des connaissances. Les résultats de cette étude appuient l'utilisation d'un cadre conceptuel intégratif utilisant des éléments contextuels dans le développement de la théorie du transfert et de la translation de connaissances dans la perspective de la FMC / DPC.

Mots clés: Transfert des connaissances, Translation des connaissances, Formation médicale continue, Développement professionnel continue, Apprentissage des adults, Contexte, Éthique, Réglementation, Économique, Politique, Socioculturel, Technologique

ABSTRACT

Purpose: This study had two main research objectives: to describe how contextual elements influence the continuing medical education (CME) and continuing professional development (CPD) knowledge transfer/translation process and stakeholders, and to explain how these influences compare in Canada, the United States and England. **Subjects:** Purposive and snowball sampling techniques were used to recruit interview participants. Sixteen participants were ultimately selected. **Method:** Semi-structured in-depth interviews were conducted in person or over the phone with selected participants, using an interview guide based on the literature on knowledge transfer and translation, continuing medical education, continuing professional development, and adult learning theories. **Results:** Interview participants mentioned a number of factors related to the knowledge transfer/translation process. These were divided into five topics: CME/CPD as a field and profession; the "business" of CME/CPD; the new focus of CME/CPD; the new formats used in CME/CPD; and the impact of contextual elements on the CME/CPD process. Four categories were used to analyze the specific impact of contextual elements on the knowledge transfer/translation process: *source*, *content*, *medium*, and *user*. The economic, political, ethical, regulatory, socio-cultural and technological contextual environments all overlapped and were interconnected amongst and between the countries under study. In terms of *knowledge sources*, the ethical and regulatory dimensions were especially influential in all three countries, but particularly in the United States because of the specific entrepreneurial/business-focused perspective in that country. The CME/CPD *content* and the increasing focus on quality CME/CPD was related to the economic, ethical and regulatory dimensions in all three countries under study. Technological, economic, and socio-cultural factors directly affected the CME/CPD media and formats available in all three countries equally. Ethical, regulatory and political aspects were the important dimensions regarding the knowledge *user* category, with an emphasis on regulatory issues in the United States and political pressure in England. **Conclusion:** The CME/CPD knowledge transfer/translation process involves a number of overlapping contextual elements that affect local, country-specific CME/CPD differently. These contextual elements can be viewed both as barriers and/or facilitators to the knowledge transfer/translation process. The results of this study support the use of an integrative framework using contextual elements in the development of knowledge transfer/translation theory within the CME/CPD perspective.

Key words: Knowledge transfer, Knowledge translation, Continuing medical education, Continuing professional development, Adult learning, Context, Ethical, Regulatory, Economic, Political, Socio-cultural, Technological

INTRODUCTION

We are currently living through what authors call a "third industrial revolution" (Drucker, 2002; Plihon, 2004; and Foray, 2000) – an information technology revolution – characterized by information and communication technology and the proliferation of knowledge in all spheres of society. As in many other areas of our knowledge-based society, the evolution and development of knowledge in healthcare occurs at an astounding rate. The Cochrane Collaboration, a voluntary organization which systematically reviews new clinical data, has identified over 600 000 clinical trials underway or set to be starting in the near future (The Cochrane Library, 2011). Each of these trials has the potential to generate vast amounts of new knowledge – new clinical evidence, new diagnostic tools, new practice methods, and/or new treatment options.

Knowledge in healthcare appears in many forms beyond the publication of systematic reviews of clinical trial results. It can take place in informal discussions with colleagues, in formal courses, in presentations from opinion leaders, in hospital rounds, in sales and marketing data by commercial companies, in practice guidelines, in public policy, in pricing and purchasing policies, in professional laws, rules and codes, in technological advancements... and the list goes on. This is the complex, knowledge-rich world in which physicians operate.

Indeed, doctors are not just caregivers. They are "knowledge workers," a class of workers specific to our knowledge-based economy. They, like lawyers and researchers, are "workers who have a high degree of expertise, education, or experience, and the primary purpose of their jobs involves the creation, distribution, or application of knowledge" (Davenport, 2005, p. 10).

But doctors are, fundamentally, caregivers, as well as teachers, administrators and researchers, with great responsibility for and accountability towards their patients, their profession, and society in general. Keeping up with new knowledge, replacing knowledge that rapidly becomes obsolete, and maintaining clinical and professional expertise

throughout a medical career (long after the completion of formal medical school training) are both a challenge and a necessity in the medical field.

It has been calculated that doctors would need to read 20 articles a day all year round to stay abreast of all current knowledge – a finding which undoubtedly has increased since its publication a decade ago (Shaneyfelt, 2001). Yet reading is not always sufficient. Indeed, moving knowledge into practice, a process known as knowledge translation, implies changing physician attitudes, behaviours and skills to improve the quality of their professional work and to ensure optimal patient care and safety.

Recognizing this need for physicians to stay abreast of current developments in healthcare and to hone their practice-based skills, the medical profession has set up formalized, credit-based systems of knowledge transfer/translation for physician learning. These are known as Continuing Medical Education (CME) and Continuing Professional Development (CPD). In CME/CPD systems, physicians gain credits for each activity they complete to keep up with professional requirements and constantly evolving knowledge, science, and technology. Whilst these systems of lifelong learning originally focused primarily on medical knowledge, they are now also geared towards helping physicians acquire leadership, communication, and other non-medical skills to assist them in their practice.

The CME/CPD knowledge transfer/translation process is not a straightforward, linear affair. It relies on recursive, back-and-forth exchanges between several stakeholders, including those who produce knowledge, those who use knowledge, those who link these two groups, and those who oversee the rules and regulations surrounding this process, amongst others. Each person involved in the transfer process has his or her own needs, motivations and barriers, and the process itself occurs within a wider economic, social, technological, political, legal and ethical context.

It is precisely this complex process and its position within a wider society that we aim to dissect and understand through this study. The next section will highlight our research objectives. It will also present our research question, which guides the rest of this work.

Study Objectives

The complexities of the CME/CPD knowledge transfer/translation process – and of its surrounding environment – are what concern us in this study. As a partial fulfilment for the Master's in Business Administration degree, this thesis seeks to describe and explain the views of experts on specific contextual particularities in the CME/CPD knowledge transfer/translation process in three different countries: Canada, the United States, and England. We aim to gain a better understanding of the elements that act as barriers or facilitators supporting the transfer/translation process and the involved stakeholders.

In short, the goal of this thesis is to answer the following research question:

How do contextual elements influence the CME/CPD knowledge transfer/translation process and stakeholders, and how do these influences compare in Canada, the United States and England?

Summary of Chapters

The first section of this study lays the foundation upon which to base the rest of our research. In the next chapter, we present our review of the literature, composed of two parts. The first part highlights the main theories and findings on knowledge and knowledge transfer/translation, all within the context of a knowledge-based economy. The second part describes the evolution of CME/CPD, a subset of knowledge transfer/translation, discussing the process, the various stakeholders involved, the main goals and outcomes, along with the related adult learning and constructivist theories.

Both parts of the Literature Review are both used to build the Conceptual Framework, which is the subject of Chapter 2 of this study. In this chapter, we present the Conceptual Framework in diagram form, highlighting all of the major elements and stakeholders of the

CME/CPD knowledge transfer/translation process and surrounding contextual environments. We then describe the different parts of the diagram and process in detail.

Next, Chapter 3 describes the research design and methodology used for this research. It highlights the chosen qualitative approach, the sampling methods, the in-depth interview process and the subsequent content analysis which was undertaken. Each step in the process is described in detail so that fellow researchers can systematically follow our research and better understand our findings.

Chapter 4 contains our Description of the Research Context. In this chapter, we provide an overview of the healthcare system in each of the countries under study: Canada, the United States and England. We then provide a description of each of the elements of the Conceptual Framework in each of the countries, using a synthesis of numerous publications, regulations, codes, and policy statements from some of the stakeholders involved.

Chapter 5 presents the main results from our research, highlighting key elements that surfaced during the in-depth interviews. We separate our findings into the main elements described in our Conceptual Framework, along with new categories for variables that were not previously considered. Quotes from the interviewees provide a rich, thick description of the issues at hand.

We provide our analysis of our research findings in Chapter 6. In this chapter, we tie in our research results with our previous Literature Review and Conceptual Framework, emphasizing what we believe to be the causes and linkages for the major elements discussed. We also describe the limits of our research in Chapter 6, along with other possible research perspectives. This study ends with our concluding remarks, linking back to all of the other elements of this thesis. Lastly, all of the bibliographic references used to this study are listed and appendices mentioned throughout the chapters are attached at the end.

CHAPTER 1
LITERATURE REVIEW

1. Overview of the Literature

This literature review is divided into two main sections. The first part centers around the notion of knowledge and knowledge transfer and identifies the key authors and findings in the knowledge transfer literature. It discusses the various models used to describe knowledge transfer in the context of knowledge-based societies, and specifically within the medical domain. The second part focuses on continuing medical education (CME) and continuing professional development (CDP) and describes the particularities of the medical field, tying knowledge transfer processes to CME/CDP activities. Both sections of this literature review come together at the end to provide the main pillars upon which to base our emerging conceptual framework, used throughout the rest of this study.

1.1. Knowledge Transfer and Society

Before delving into the topic of knowledge transfer, it is essential to first understand what is meant by "knowledge" and to describe the context that gives knowledge such importance in our society. Although innovation and knowledge have long been viewed as catalysts for the economy (Schumpeter, 1934), it was not until recently that technological advances would permit a massive acceleration in the transmission of knowledge and information, as well as the emergence of an organizational science discipline known as "Knowledge Management" – features inherent to our current knowledge-based economy.

1.1.1. Knowledge vs. Information vs. Data – What's what?

The first step in a study of knowledge transfer is to understand what is meant by "knowledge" and to distinguish it from the often-confused terms "information" and "data." This is an area of ongoing academic debate. Indeed, the problem of defining knowledge has been around since the time of Greek philosophers, and still no consensus exists today. This makes the study of knowledge management or knowledge transfer at times ambiguous and confusing.

As Hicks *et al.* (2006) state:

> There is a consensus that data are discrete facts, but after that, consensus is lacking. The lack of consistent definitions for data, information, and knowledge make rigorous discussions of [knowledge management] difficult (p. 19).

Hence, the next section briefly provides the working definitions of knowledge, information and data, definitions which have been adopted throughout this study.

A common view in the literature is that data is raw numbers and facts. These "facts" are defined as "atomic attribute values about the domain," (Hicks, *et al.*, 2004), in other words, figures, symbols or statistics that carry little meaning on their own. Once combined or contextualized, however, this data creates information (i.e. "information is processed data", Hicks, *et al.*, 2006) and knowledge is combined or "authenticated" information, or information with meaning (Machlup, 1980; Dretske, 1981; Amidon, 1997; Vance 1997; Alavi and Leidner, 2001; Hicks 2006).

Foray (2000, p. 9) describes the distinction between knowledge and information in psychological terms. He attributes a cognitive, learning capacity to knowledge, while describing information as "a set of formatted and structured data." Similar distinctions have been made throughout the literature (Hislop, 2003; Soekijad *et al.*, 2004; Schönström, 2005; Brauner and Becker, 2006; Rowley, 2006), implying that knowledge occurs *within* individuals

(as an activity), whereas data and information are "objects" outside of the individual (Beesley and Cooper, 2008).

Often cited, Davenport and Prusak's (1998) definition further describes how knowledge resides "inside" a person, like a "framework" for understanding the world:

> "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers." (p. 5)

In short, data and information are more easily stored, accessed and shared, but knowledge is embedded within individuals "and can only be shared if those who have it are prepared to do so" (Brauner and Becker, 2006, in Beesly and Cooper, 2008). This "sharing" is also known as knowledge transfer, and the particularities and stages inherent to this process will be discussed in latter part of this chapter.

For now, let us recap the definitions retained for the purposes of this study:

Data is raw facts and numbers.

Information is the processing, formatting or combination of data.

Knowledge is information with personalized meaning that exists within the individual.

1.1.1.1. Tacit vs. Explicit Knowledge

Beyond the distinctions between data, information and knowledge, it is important to note the two dimensions of knowledge that frequently reoccur within the literature: the tacit and explicit dimensions of knowledge (Polanyi, 1962, 1967; Nonaka 1994). Explicit knowledge is formal, articulated and systematic. Easily transmittable, it can be analyzed by a machine, since this type of knowledge is quantifiable (i.e. through mathematical expressions or grammatical statements). An example of explicit knowledge would be an intranet, where

individuals and departments within a company can access and share knowledge (i.e. budgets, contact information, project timelines, company news, etc.). Such information can be easily articulated, codified and shared. It can be translated into computer programs or concrete product specifications.

Conversely, tacit knowledge is based on an internal technical/know-how dimension as well as a cognitive/mental model dimension based on intuition and perceptions. This more personal type of knowledge is not visible and thus difficult to express via words and symbols (Nonaka and Takeuchi, 1995, p. 27).

The technical know-how aspect of tacit knowledge can be seen in the skills and expertise of a master craftsman, having perfected his trade over the years. Explaining to others how he knows what he does or how to recreate his skills is often very difficult, if not impossible. Indeed, "he is often unable to articulate the scientific or technical principles behind what he knows" (Nonaka, 1991, p. 165). He just knows. The other side of tacit knowledge – the cognitive dimension – includes mental models, beliefs, and perspectives that become completely ingrained in a person, shaping the world around them (Nonaka, 1991, p. 165). Describing these mental models or beliefs becomes near impossible and they are "blended" into a person's being.

Kneading dough into the right consistency to make bread, for instance, would be considered tacit (intrinsic) knowledge. This type of knowledge is deeply personal and not easily communicable. In order to teach (or transfer) this tacit knowledge to someone else, one can only articulate part of what is involved in kneading, the rest can only be learned through trial and error (experimentation and observation) on the part of the learner. As Michael Polanyi stated in describing tacit knowledge, "We know more than we can tell" (Nonaka, 1991).

Making personal (i.e. tacit) knowledge available to others is one of the central activities of knowledge creation and knowledge translation. Indeed, new knowledge always comes from

an individual and must be harnessed and shared with others to become "used", as Nonaka (1991) explains:

> "A brilliant researcher has an insight that leads to a new patent. A middle manager's intuitive sense of market trends becomes the catalyst for an important new product concept. A shop-floor worker draws on years of experience to come up with a new process innovation. In each case, an individual's personal knowledge is transformed into organizational knowledge" (p. 164-5).

Nonaka and Takeuchi's (1995) model of knowledge creation described how tacit and explicit knowledge could be converted into one another through four processes: socialization, externalization, combination, and internalization. Socialization is the creation of tacit knowledge directly from another person's tacit knowledge. For instance, an apprentice can learn the tacit skill of kneading dough by observing and imitating a master baker, and by practicing until the outcome is favorable. This apprentice adopts the master's skills and know-how and these become part of his or her knowledge base. As Nonaka (1991) explains, this person is "'socialized' into the craft" (p. 165). While neither the apprentice nor the master explicitly express *how* they know what they know, they are able to share/gain this knowledge solely through implicit means.

Externalization, goes one step further. It is an attempt at translating or expressing tacit knowledge into explicit knowledge through figurative language like metaphors, analogies, concepts, hypotheses and models. As Nonaka (1991, p. 165) describes, it is "expressing the inexpressible." For instance, describing a "twisting-stretching" technique of kneading dough provides a verbal and visual representation of tacit know-how. This type of explicit knowledge can then be leveraged and shared with a wide range of individuals, instead of being limited to tacit-to-tacit exchanges.

Combination occurs through the new configuration of existing explicit knowledge. Putting two distinct pieces of explicit knowledge together, for instance, can create a new piece of

explicit knowledge. An example of this is the creation of a manual or a product based on standardized articulated knowledge.

As new explicit knowledge is shared, it can be internalized by individuals (explicit to tacit). It becomes part of people's own tacit ways of doing things, and can "broaden, extend, and reframe their own tacit knowledge" (Nonaka, 1991, p. 165). Eventually, this transforms experience into shared mental models and new technical know-how.

Nonaka and Takeuchi describe this four-stage process as the "spiral" of knowledge creation, which occurs endlessly at higher and higher levels, the more each individual's tacit, intuitive knowledge base grows. Indeed, it is a process of making tacit knowledge explicit, and this concept can be transferred to the process of knowledge translation, which we will be looking at in the next section.

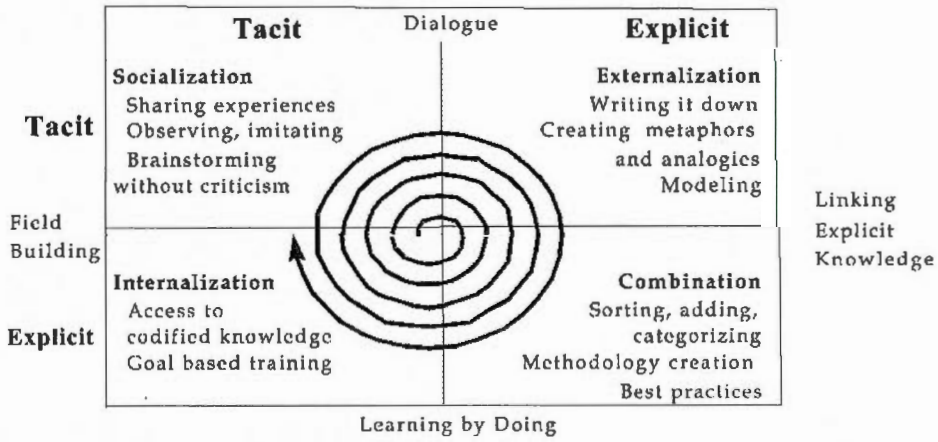


Figure 1.1. Nonaka and Takeuchi's Model of Knowledge Conversion (1995)

In conclusion, a distinction exists not only between data, information, and knowledge, as well as the tacit and explicit knowledge dimensions, but also in the ways in which such

knowledge is disseminated. Indeed, as we will discuss later, knowledge translation practices must take all of these differences into account.

1.1.2. The knowledge society and knowledge workers

> "Industrial society was still essentially a traditional society in its basic social relationships of production. But the emerging society, the one based on knowledge and knowledge workers, is not. It is the first society in which ordinary people--and that means most people--do not earn their daily bread by the sweat of their brow. It is the first society in which 'honest work' does not mean a calloused hand. It is also the first society in which not everybody does the same work, as was the case when the huge majority were farmers or, as seemed likely only 40 or 30 years ago, were going to be machine operators. This is far more than a social change. It is a change in the human condition."
>
> – Peter F. Drucker (1994)

Many authors including Drucker (2002, p. 4), Plihon (2004, p. 7) and Foray (2000, p. 18, citing Howitt, 1996) describe the recent evolution of the economy as the "third industrial revolution" – an information technology revolution – comparable to the previous textile and agricultural revolutions and characterized by the growing role of intangible capital (education, training, etc.), as well as the mass proliferation of new information and communication technology (ICT). Indeed, ICTs first emerged around the time of the Second World War and the discovery of computers and information technology (Plihon, 2004). Whereas the steam engine, railroads and electricity were the propelling forces of the first two industrial revolutions, the computer and its technology offshoots stand clearly as the emblems of the third revolution. Over time, the computer and other ICTs gained momentum, propagating themselves into all aspects of society. As Foray and Lundvall (1996) state, with the use of ICTs:

> "...the economy is [now] more strongly and more directly rooted in the production, distribution and use of knowledge than ever before."

In fact, nowadays, the internet, e-commerce, universal networks and other digital technologies have allowed the possibility of "mastering" and overcoming the limits of time and space... with *cyberspace* (Plihon, 2004, p. 16). Information can now be accessed anytime, anywhere. Competition is worldwide. Innovation is permanent (Foray, 2000, p. 29).

Nowhere is the mastery of time and space more evident than through the financial globalisation that has occurred as a bi-product of this technological revolution. With the abolition of "borders" through global networks and cyberspace, capital can circulate instantly, freely, and at an international level (Plihon, 2004, p. 33). Knowledge and innovation – intangible goods – have become sources of power, value and profit: the main competitive advantages for nations, organizations and individuals (Plihon, 2004)[1]. New financial instruments supporting risk-taking and speculation have been developed to encourage investments in this new, intangible, and potentially lucrative financial reality (Foray, 2000, p. 19).

Indeed, as the opening quote suggests, our present society is characterized by a new form of capitalism built upon a "knowledge-based economy" (Foray, 2000). The Organization for Economic Co-operation and Development (OECD) defines knowledge-based economies as: "economies which are directly based on the production, distribution and use of knowledge and information" (OECD, 1996, p. 3) as well as the "trends in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors" (OECD, 2005).

Two quotes by the OECD and Peter Drucker summarize the importance of knowledge as a competitive asset in our knowledge-based society:

> "Today, knowledge in all its forms plays a crucial role in economic processes. Nations which develop and manage effectively their knowledge assets

[1] This new conception of the economy differs greatly from traditional, industrial capitalism, where hard goods and tangible means of production were the basis of economic growth (Drucker, 1993).

> perform better. Firms with more knowledge systematically outperform those with less. Individuals with more knowledge get better paid jobs. This strategic role of knowledge underlies increasing investments in research and development, education and training, and other intangible investments, which have grown more rapidly than physical investment in most countries and for most of the last decades." (OECD, 2005)
>
> "How well an individual, an organization, an industry, a country, does in acquiring and applying knowledge will become the key competitive factor. The knowledge society will inevitably become far more competitive than any society we have yet known--for the simple reason that with knowledge being universally accessible, there will be no excuses for nonperformance. There will be no 'poor' countries. There will only be ignorant countries. And the same will be true for companies, industries and organizations of all kinds. It will be true for individuals, too." (Drucker, 1994).

Clearly, the impact of knowledge on our society is significant – from the national level down to the individual level. In the early 21st century, knowledge-based industries, (including high-technology goods and manufacturing as well as knowledge-intensive users of technology such as financial institutions, insurance companies, businesses, and other services), "[accounted] for more than half of OECD GDP and [continued] to grow rapidly" (OECD, 2000). The intensity and growth of knowledge-based industries are measured through various indicators including: direct government funding of business research and development (R&D), indirect government funding (i.e. through tax credits), R&D investments through venture capital and business angels, business enterprise expenditure, higher education expenditure, ICT investments, interest rates, patenting activity, and much more[2].

Although the most recent economic crisis caused drops in venture capital, foreign direct investment and research and development expenditures dealing with innovation (OECD, 2009), "innovation is seen as a critical part of an effective response to [the challenges brought about by the economic downturn]" (OECD, 2009, p. 9).

---

[2] The aim of this paper is not to discuss innovation measurement. See the OECD's 2010 publication: *Towards a Measurement Agenda for Innovation* for a more lengthy discussion on innovation indicators.

The growth of knowledge-based industries as well as continual changes in the ICT landscape have brought about transformations in production processes, for example by "[slicing] up the value chain and [fragmenting] the production of goods and services across countries" (OECD, 2009, p. 12). Organizational structures and ways of operating have also been affected (Foray, 2000, p. 25). Furthermore, the rapid proliferation of ICTs and their use in generating, acquiring, and applying knowledge have had an impact on society itself. ICTs have multiplied 1) the perpetual appearance of new knowledge, 2) the explosion of knowledge-intensive jobs and 3) the need for highly-skilled, highly-qualified workers, known as "knowledge workers." These last three points will be discussed in greater detail since they are directly related to continuing education in the field of medicine (covered in the second part of this chapter).

1.1.2.1. The proliferation of knowledge and Knowledge Management

The exponential increase in newly-generated knowledge, whether incremental advances or radical new discoveries, has occurred at an astounding rate. Indeed, in a recent industry white paper[3], International Data Corp states that "by 2020, our Digital Universe [the amount of information created and replicated each year] will be 44 TIMES AS BIG as it was in 2009," growing to "an almost inconceivable 35 trillion gigabytes as all major forms of media – voice, TV, radio, print – complete the journey from analog to digital" (IDC, 2010, p. 1). Bohn and Short (2009) conducted a study on actual information consumption by Americans and found that "consumption totalled 3.6 zettabytes[4] and 10,845 trillion words, corresponding to 100,500 words and 34 gigabytes for an average person on an average day" (p. 1).

In short, people are consuming only a small portion of the information created and replicated each year and, therefore, new tools and strategies are required for dealing with

---

[3] This was a study on the "Digital Universe," or the amount of digital information created and replicated in a year, written by International Data Corp (IDC), a Global Markets Intelligence firm: http://www.idc.com/home.jsp and sponsored by EMC, a network storage, data recovery, and information management provider: http://www.emc.com/.

[4] As the authors note, "a zettabyte is 10 to the 21st power bytes, a million million gigabytes."

such vast amounts of information, sometimes known as "information overload." In this sea of information, it becomes important for people (and businesses) be able to access the right information at the right time, and to distinguish which information is accurate, useful and worthwhile, and to be able to acquire, share and disseminate it. The IDC (2010) report highlights several important factors to consider regarding the growth of the Digital Universe, including new search tools and ways to add structure to unstructured data (p. 3). One solution to this has been the use of search engines, such as Google, for internet searches.[5]

Beyond search engines and other search tools, the entire field of Knowledge Management (KM) has emerged, tying together the various levels (individual, organisational, sociological, and technological) that influence the creation, dissemination, and utilisation of knowledge. As can be seen in organizational science and strategic business management literature, Knowledge Management as a discipline was first established in the early 1990s, when organisations began to understand the need to harness and leverage knowledge and intellectual capital in order to gain a lasting competitive advantage in their industry (Drucker, 1991; Kougot and Zander, 1992; Cole, 1998; Spender, 1996a, 1996b; Nonaka and Takeuchi, 1995)[6]. This is known as the knowledge-based theory of the firm, where "knowledge is the organizational asset that enables sustainable competitive advantage in hypercompetitive environments" (Alavi and Leidner, 1999)[7]. As Alavi states, in this perspective, "the firm can be seen as a knowledge system engaged in knowledge creation, storage, transfer, and application."

KM initiatives within an organization are widespread, including everything from intranets, network-based storage and sharing of data to knowledge processing, document

---

[5] According to the Google website, Google "founders Larry Page and Sergey Brin named the search engine they built "Google," a play on the word "googol," the mathematical term for a 1 followed by 100 zeros. The name reflects the immense volume of information that exists, and the scope of Google's mission: **to organize the world's information and make it universally accessible and useful**" (emphasis mine).

[6] Harnessing and leveraging knowledge, however, were not new concepts, as the fields of Organizational Learning (Argyris and Schön, 1978) and Systemic Thinking (Senge, 1991) existed since the 1970s. Both disciplines provided models of individual and organizational learning, giving organizations their competitive advantage for utilizing knowledge, and creating wealth for these companies (Veybel and Prieur, 2003).

[7] This perspective builds upon and extends the resource-based theory of the firm. See: Penrose (1959); Barney (1991); Conner, (1991); and Wernerfelt, (1984).

management and other software tools (Veybel and Prieur, 2003). Indeed, knowledge "is embedded in and carried through multiple entities including organization culture and identity, routines, policies, systems, and documents, as well as individual employees" (Grant 1996a, 1996b; Nelson and Winter 1982; Spender 1996a, 1996b, in Alavi and Leidner, 2001).

However, KM has roots and applications beyond business management. Indeed, an analysis of over 100 websites on knowledge management carried out by Quintas *et al.* (1997) revealed a wide range of topics relating to KM, including: economics, intellectual capital, engineering approaches (flexible manufacturing systems), aspects of computing and knowledge media, organization studies (based around anthropology, sociology, etc.), epistemology (including learning, situated cognition and cognitive psychology), other aspects of classification and definition informed by artificial intelligence, human resource issues, etc. (Lloria, 2008, p. 91). This analysis was conducted over 14 years ago, and the scope of Knowledge Management has been widened considerably since. In a recent editorial, Chase (2006) mentioned that contributors to the seminal *Journal of Knowledge Management*, heralded from a slew of academic disciplines, including: cognitive psychology, design, economics, engineering, human resources development, information technology, library science, management, organizational behavior and organizational learning.

Because of the breadth of its applications and the variety of backgrounds of its research contributors, KM (like the term "knowledge" itself, which was discussed earlier) is difficult to define (Hicks, 2006; Earl, 2001). A universally-accepted definition of KM does not exist; however, several authors from a variety of backgrounds have suggested varying definitions on the subject[8].

Most authors posit an "organizational asset" definition of knowledge management, grounded in the knowledge-based view of the firm discussed earlier:

> "A conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways

[8] See, for instance, Hlupic *et al.* (2002), who found over 17 different definitions of KM, or Lloria (2008), who reviewed the main approaches to KM.

> that strive to improve organizational performance" (O'Dell and Jackson, 1998, p. 4).
>
> "Knowledge management refers to identifying and leveraging the collective knowledge in an organization to help the organization compete" (von Krogh, 1998).

However, for the purposes of this paper, we will use Alavi and Leidner's (2001) definition, who portray KM in simple terms:

> "Knowledge management is largely regarded as a process involving various activities... At a minimum, one considers the four basic processes of creating, storing/retrieving, transferring, and applying knowledge" (p. 114).

In the next sections, we will focus on the third and fourth processes, knowledge transfer and its application, as they pertain to the knowledge-intensive field of medicine, and medical practitioners, who can be considered knowledge workers (discussed next).

1.1.2.2. Knowledge-intensive jobs and Knowledge workers

Peter Drucker coined the term "knowledge worker" in 1959, when he described in his book *Landmarks of tomorrow* the upcoming, profound change that would occur in the very nature of work. He described a new class of workers – the knowledge workers of the future – that would dominate industrial workers if not in the size of their class than in societal importance. To him, these knowledge workers were opposite to manual workers. He later went on to refine his definition to include the notion of knowledge worker performance capacity, which is dependent on both formal education and theoretical knowledge (Drucker, 1994, p. 64). More recently (but very similarly), Davenport defines knowledge workers as "workers who have a high degree of expertise, education, or experience, and the primary purpose of their jobs involves the creation, distribution, or application of knowledge" (Davenport, 2005, p. 10). Such knowledge workers can include programmers, secretaries, lawyers, researchers, nurses, doctors, and students – really anyone working with knowledge on a daily basis.

Drucker stressed the importance of formal and continuing education in the new, knowledge-based society. Indeed, he stated "knowledge rapidly becomes obsolete, and knowledge workers regularly have to go back to school" to keep their knowledge up-to-date (Drucker, 1994). Such knowledge workers are required to continually maintain and update their competencies in order to keep up with the constant changes and vast array of knowledge and information generated and attributed to ICTs (Drucker, 2001).

Hence, what concerns us in this paper is the acquisition and effective use of knowledge by individuals, or more specifically a certain type of knowledge worker: medical practitioners. How do these knowledge workers acquire and apply knowledge? The key is knowledge transfer and translation, which will be discussed next.

1.1.3. Knowledge Transfer

Now that we have presented what is meant by "knowledge", as well as discussing the importance of knowledge and knowledge workers in present day society, it is time to delve into the topic of knowledge transfer and translation. The next section will highlight varying definitions of knowledge transfer and translation within the health field, and present four different models of knowledge transfer, each widely used and represented in knowledge transfer and translation literature.

1.1.3.1. Definitions of Knowledge Transfer

Much like the terms "knowledge" and "knowledge management," knowledge transfer itself is surrounded by a sense of ambiguity. Several different terms have been used in knowledge transfer literature, spanning across many disciplines, including management, technology, health, education and educational psychology, making it difficult to delineate one clear, overarching definition (Oliver, 2009). Terms such as knowledge translation, knowledge utilization, knowledge-to-action, knowledge sharing, knowledge exchange, knowledge

internalization, as well as diffusion, dissemination and implementation, have all been used (at times interchangeably)[9] to describe "the process of getting knowledge used by stakeholders" (Graham *et al.,* 2006). Indeed, knowledge transfer is "the conveyance of knowledge from one place, person or ownership to another... [and] successful knowledge transfer means that transfer results in the receiving unit accumulating or assimilating new knowledge" (Liyanage, 2009, p. 122).

Over the years, many models have been created to describe the knowledge transfer process[10]. Although it is beyond the scope of this paper to review each of these varied perspectives, authors generally consider a combination of four major elements: source, content, medium and user (NCDDR, 1996, p. 12-28). The importance of these four elements has been known for some time and stems from Shannon and Weaver's (1949) mathematical theory of communication model, showing the communication process from its origins (sender or information source) to its destination (receiver).

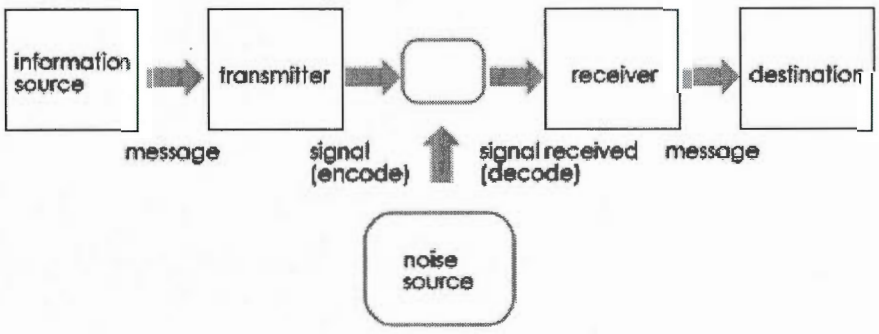


Figure 1.2. Shanon and Weaver's (1949) Mathematical Theory of Communication Model

It is not necessary to describe Shannon and Weaver's model in detail for the purposes of this paper. Instead, let us briefly define the four elements (source, content, medium and user), which make up most models of knowledge transfer, keeping in mind that they find

---

[9] See Graham *et al.*, 2006.

[10] Ward *et al.*, 2009, found and analysed 28 of such models. We will discuss some of the most commonly cited (diffusion, dissemination and implementation; linkage/two communities; problem-solving, as well as the "knowledge-to-action" framework) in the KT models section below.

their origins in Shannon and Weaver's work. Let us now examine each of these elements separately.

The **source** is where the dissemination of information originates (i.e. with the knowledge creator). It also applies to any intermediaries[11] who transfer the message to intended users. When thinking of sources of dissemination in knowledge transfer, one must consider factors including the source's perceived competence and credibility as well as his or her relationship to potential knowledge users, amongst several other issues. All of these factors impact the successful transfer of knowledge. It is also important to note that knowledge transfer (and its utilization) is generally more successful when knowledge sources (i.e. researchers or creators of knowledge) are aware of the needs of potential users and when they orientate their research and dissemination efforts towards these users (NCDDR, 1996, p. 16).

The **content** is the message that is being transferred. This can be new knowledge itself along with any supporting information or materials. Certain attributes of the message content ensure the successful transfer (and, especially, use) of knowledge. These include the type and quality of the content (i.e. research protocol, methodology, outcomes, etc.), its utility and relevance for potential users, its clarity, and many other factors in line with the compatibility of the content with the needs and beliefs of potential users. Again, the more relevant the content for its intended audience, the more successful the transfer of knowledge will be.

The dissemination **medium** is the "vehicle" in which the content of a message is "packaged" and transmitted. This includes personal interaction (one-to-one, one-to-many, many-to-many), printed media (journals, magazines, books, etc.) and digital formats (audio, video, and internet), or, ideally, a combination of these. Most authors agree that personal interaction remains one of the most important mediums for the transfer of knowledge, and

[11] These "intermediaries" are also called "linking agents" or "knowledge brokers" in the KT literature. We will discuss the role of these individuals in greater detail in the KT models section below.

that the combination of personal interaction with another medium often leads to the most successful knowledge transfer (Dobbins, 2009).

Lastly, the **receiver** is the intended user of the knowledge. In order to be successful, knowledge transfer efforts must take into consideration the context and concerns (needs and beliefs) of these potential users. Furthermore, the utilization of knowledge often necessitates a change of behaviour or attitude on the part of the user and this can only be achieved based on the user's readiness towards change as well as their willingness to change.

As stated, all four of these elements find their way into most KT models, since knowledge transfer can be considered an act of communication, whether verbal, interpersonal or technological (Liyanage, 2009).

For the purposes of this paper, we will now discuss how knowledge transfer is defined in terms of health sciences, the discipline most related to Continuing Professional Development. We will then give an overview of the main models of knowledge transfer found in the literature.

1.1.3.2. Knowledge transfer in the medical field – Knowledge Translation

Within the health sciences research and medical fields, knowledge transfer is examined, studied, and described as more than a communication process. Indeed, for medical practitioners and researchers, knowledge transfer goes one step further, looking not only at the transfer, but also at the *application* of knowledge. This is referred to in several different terms, each describing the process of transferring new knowledge (i.e. scientific research findings) into practice, or facilitating the uptake of research by the medical community (Graham *et al.,* 2006). The terms used vary around the globe, but the basic concepts remain the same. Since this paper focuses on comparing Canada, England and the United States, we will review the terminology in each of those areas, based on the research of Straus, *et al.* (2009).

In the United Kingdom and Europe, terms such as "implementation science" or "research utilization" are used to describe knowledge transfer and application in the medical field. The United States often uses the terms "dissemination and diffusion," "research use," and "knowledge transfer and uptake." In Canada, the terms "knowledge transfer and exchange" and "knowledge translation" are commonly used (Straus, *et al.*, 2009).

The following definition by the Canadian Institutes of Health Research (CIHR, 2005) has been adopted, supported and adapted worldwide:

> "[Knowledge Translation] is defined as a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system."

Indeed, in 2005, the World Health Organization (WHO) adapted the CIHR's definition and defined knowledge translation as:

> "The synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health" (WHO, 2005).

Graham *et al.* (2006) provide a good summary of the above definitions, stating that the overall purpose of knowledge-to- action (or knowledge translation) in the medical field is:

> "To address the gap between what is known from research and knowledge synthesis and implementation of this knowledge by key stakeholders with the intention of improving health outcomes and efficiencies of the health care system" (Graham *et al.*, 2006).

1.1.3.2.1. Why Knowledge Translation?

As stated above, improving health outcomes and efficiencies of the health care system are the overall goals of knowledge translation. Although there have been a few documented

cases of research being moved into practice quickly merely through the publication of research, "incorporating research findings into health policy and routine clinical practice is often unpredictable and can be slow and haphazard, thereby diminishing the return to society from investments in research" (Tetroe *et al.*, 2008, p. 126). Indeed, certain authors have noted that the delay between research and practice can be as much as 17 years (Clancy and Cronin, 2005).

The implications of adequately translating research into medical practice (and doing so in a timely manner) are immense for economic and societal reasons, not least of which are safety concerns for patients who could possibly suffer or die from lack of best possible medical care. In fact, many recent studies have highlighted this as a "Clinical Care Gap[12]" between what is known in the research (or theory) and what is actually applied in medical practice and public policy, in areas as varied as diabetes and cancer care (Timmermans & Mauck, 2005; Liang, 2007; Grimshaw *et al.*, 2004; Graham *et al.*, 2006). In medicine, this "gap" has led to a variety of clinical, quality and safety issues, including the "underuse, overuse and misuse of drugs" (Chassin, 1998). Beyond academic and peer-reviewed journal publications, several high-profile reports and white papers on the subject have emerged in the last decade, demonstrating the growing public (and political) interest in this field[13].

Two different quotes by the World Health Organization (WHO, 2003 & 2006) summarize the necessity of transslating "knowledge into action" in medicine:

> "There are many examples of potentially effective [products] that have had only limited impact on the burden of disease because of inadequate implementation resulting in poor access... Research on these products ceased too early. It is now agreed that research should not stop after providing the proof of principle

[12] This "Clinical Care Gap" is also called the "Knowledge-to-Action" or "Know-Do" Gap. While we will focus on the medical (clinical care) gap for the purposes of this paper, it is important to note that gaps between knowledge and the implementation of this knowledge are not specific to the medical domain, but have been mentioned in the literature from a variety of fields, including business, marketing, agriculture, engineering, etc. (Fixsen, Naoom, Blasé, Friedman, and Wallace, 2005).

[13] See, for instance, Part 6 of the 2001 Institute of Medicine report titled "Crossing the Quality Chasm: A New Health System for the 21st Century" and discussions from the Clinical Research Roundtable at the US Institute of Medicine (in Sung, *et al.*, 2003).

for a product, or after demonstrating its effectiveness in selected situations, but that it has an additional critical role to play in helping solve major implementation problems."

- WHO, Rationale for implementation research, 2003.

"There is a gap between today's scientific advances and their application: between what we know and what is actually being done... Health work teaches us with great rigour that action without knowledge is wasted effort, just as knowledge without action is a wasted resource."

- LEE Jong-wook, WHO Director-General, 2005.

1.1.3.2.2. Barriers to Knowledge Transfer/Translation or Reasons for the "Gap"

"The man who has the time, the discrimination, and the sagacity to collect and comprehend the principal facts and the man who must act upon them must draw near to one another and feel that they are engaged in a common enterprise."

- Woodrow Wilson (Address to American Political Science Association, December 27, 1910)

Several factors limit the adequate transfer, translation and application of knowledge. Within the knowledge transfer process spectrum, these barriers can be separated into issues on the knowledge producer end (i.e. stemming from researchers or other knowledge "sources"), on the practitioner end (i.e. stemming from knowledge users or "receivers"), in the surrounding "context," or in the actual knowledge being transferred. These barriers can be situated at the individual, organisational, or societal levels, based on personal

characteristics or contextual (economic, social, political, technological, etc.) issues. In this section, we will explore some of the barriers most commonly cited in KT literature.

Many researchers have described the clashing "contexts" within which knowledge producers and potentials knowledge users reside, making interactions and successful knowledge transfer, and eventually translation into practice, difficult (and sometimes impossible) between the two groups:

> "Researchers and practitioners [occupy] different worlds: they operate on different time-scales, use different languages, have different needs and respond to different incentive systems" (Nutley and Davies, 2002, p. 6).

These different "worlds" are also known as "two communities" in the KT literature (Caplan, 1979; Hutchison, 1995)[14]. On one hand, knowledge producers (i.e. researchers and scientists) focus on "science and esoteric issues," whereas potential knowledge users (such as policy-makers and other practitioners) are "action-oriented, practical persons concerned with obvious and immediate issues" (Caplan, 1979, p. 459). Because they have such different goals and reside in such different contexts, with little communication flowing between them, knowledge sources and potential users are isolated from one another and unable to take into account each other's realities and perspectives[15]. Furthermore, as Nutley and Davies' quote above states, each "community" has its own language or "jargon", its own reward system, its own approaches to solving problems. Hence, the gap exists, and on one hand, research goes unnoticed by practitioners. On the other hand, researchers might completely overlook research topics that might be very useful to practitioners. Another quote by Lomas (2007) summarizes (if humorously) the two-communities issue:

---

[14] Caplan's "two-communities" metaphor stems from C.P. Snow's position in *The Two Cultures and the Scientific Revolution* (1959), in which Snow describes the gap between those in hard sciences and those in humanities, where individuals are specialists in one culture and ignorant of the other culture.

[15] We will discuss the "linkage" and "social interaction" models of KT in the next section, showing how the "two communities" can be bridged via different mechanisms to facilitate the adequate transfer of knowledge.

> "Researchers tend to see decision making as an event—they deliver their edicts to the impenetrable cardinals' retreat and await the puff of smoke that signals "decision," while grumbling about irrationality within the conclave. Decision makers—the patients, the care providers, the managers, and the policy makers—tend to see research as a product they can purchase from the local knowledge store, but too often it is the wrong size, needs some assembly, is on back order, and comes from last year's fashion line" (p. 130).

Beyond the two-communities issue, several factors exist on the researcher (or knowledge producer) end of the knowledge transfer and translation process. For instance, the researcher may lack motivation to share knowledge, or may fear losing ownership of that knowledge along with the position, privilege and superiority that come with it. Furthermore, knowledge producers might be regarded as unreliable by potential knowledge users, based on past experience, credibility, reputation or even superficial factors, such as age, sex and race.

Anderson (1992) attributes the reasons for the knowledge-to-action gap in large part to researchers who often allow much more interest, time, and effort to the production of new knowledge than to the dissemination of their research results. In essence, this means that although the research might exist, it is not reaching the appropriate stakeholders (practitioners, policy makers, etc.) because it is not diffused appropriately (if at all).

Closely linked to this barrier is the issue of adequately tailoring research results to the needs – and vocabulary – of its intended (and other potential) users. Cochrane *et al.* (2007), describe this as a barrier "embedded in the guidelines or evidence" (p. 97). This can include the lack of practical access to the research (i.e. if it is only accessible via certain databases), the lack of a comprehensible structure or format (i.e. the traditional academic format, which is not readily accessible for all users), the (perceived) lack of utility, the lack of local applicability, and the lack of convincing evidence.

On the practitioner side, potential knowledge users may often lack the skills (professional or appraisal skills for assessing evidence), knowledge, awareness, or even motivation to absorb

new knowledge. Resistance to new ideas (and to change in general) may also be a factor for certain individuals. A growing issue is also time (or the lack of it), as well as the lack of other resources (research support, technological material and financial resources) along with the sheer volume of knowledge already in existence and the "information overload" associated to it (Huberman and Gather-Thurler 1991; Kirst 2000).

Context-related barriers are often tied in to the above-mentioned issues. For instance, the lack of time and resources for practitioners may be linked to budgetary cuts or decreased funding (a barrier related to the economic dimension of the wider setting in which knowledge transfer/translation takes place). It can also be related to organizational structures and cultural elements such as the readiness for change. Political directives and incentives (or disincentives) can also be barriers or instigators of change (Greenhalgh, 2004).

All of these barriers portray the complexity of the knowledge transfer and translation process. Several mechanisms have been proposed to facilitate knowledge transfer and translation, such as "joint researcher–decision maker workshops, the inclusion of decision makers in the research process as part of interdisciplinary research teams, a collaborative definition of research questions, and the use of intermediaries that understand both roles known as 'knowledge brokers[16]'" (CHSRF 1999 in Mitton *et al.*, 2007). Furthermore, several factors are known to facilitate knowledge transfer, such interpersonal contact between researchers and decision makers, the "fundamental ingredient in successful KTE initiatives" (Thompson, Estabrooks, and Degner 2006 in Mitton *et al.*, 2007). In the next section, we will describe the most often cited models of knowledge transfer, all of which have tried to take into account the various factors involved in the KT process.

1.1.3.3. Models of knowledge transfer/translation

[16] Knowledge brokers and their particular roles will be discussed in detail in the next section.

> "Merely because information [is] timely, relevant, objective, and disseminated to the right people in usable form [does] not guarantee its use" (Rich, 1979, p. 20).

We will begin this section by describing one of the founding theories of knowledge transfer – Everett Rogers' Diffusion of Innovations theory. We will then look at Ronald Havelock's classification of knowledge transfer models and finish by describing a more recent model, directly applicable to knowledge translation in the medical field.

Models of knowledge transfer and translation have often been divided into categories based on how involved researchers (or other knowledge "sources") are in terms of diffusing, disseminating and implementing their knowledge. These categories often fall into the passive/active or knowledge push/pull dichotomies, which we will highlight below.

1.1.3.3.1. The foundation: Diffusion of innovations theory

Everett Rogers' Diffusion of Innovations theory provides much of the basis for the study of knowledge transfer (and knowledge application and translation) as we know it today[17]. His early research was on the adoption of technological change by farmers and then moved to a more general definition of diffusion, which Rogers views as:

> "The process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p. 5).

Hence, through his model, Rogers highlights several important factors: innovation, channels of communication, the time during which the diffusion takes place, as well as the social system in which this dynamic process takes place. Let us examine each of these elements separately.

[17] However, Rogers (1986) credits Ryan and Gross (1943) and their agricultural study on hybrid corn as creating the original outline for classical diffusion theory. The theory we know as Rogers' Diffusion of Innovation Theory is really only his representation of Ryan and Gross' work.

Rogers defines an "innovation" as:

> "an idea, practice, or object perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 1).[18]

Following Rogers' definition, innovations need not be tangible or technological items, as innovations are often equated to. Research itself and new knowledge (or knowledge that is perceived as being new by the potential "adopter") can also be considered innovations.

Innovations, whether tangible or not, are diffused through communication channels, which are "the means by which a message gets from the source to the receiver" (Rogers, 2003, p. 204). These can be both written and verbal channels, media-based and interpersonal contacts. Examples of these communication channels in the medical field are: printed materials, practice guidelines, educational materials, continuing medical education (CME) courses, audit and feedback, outreach, continuous quality improvement, opinion leaders, mass media, pharmaceutical policies, and pricing and purchasing policies, all of which have been studied for their effectiveness as methods for changing clinical behaviour (Oxman A., in WHO, 2006).

According to Rogers (2003), certain (perceived) intrinsic characteristics of innovations can help predict the time delay or rate at which they are adopted by individuals in a given social system (p. 219). The intrinsic characteristics of innovations include the relative advantage, or how an innovation compares to (i.e. is an improvement upon) the previous generation; the compatibility and ease of assimilation of the innovation by the potential adopter; its simplicity (or lack of complexity), which again facilitates its adoption; its trialability (or the capacity for experimentation with this innovation); and its observability (or visibility to and by others, which increases the potential for communication about the innovation).

---

[18] Other definitions of "innovation" exist, and several authors (see Bedard, Ebrahimi and Saives, 2011) have more clearly distinguished between the terms "innovation" and "invention", showing how Rogers' definition might be more closely linked to that of an "invention." However, for the purposes of this thesis, we will describe Rogers' theory and definition as he outlined them himself.

Rogers describes an "innovation-decision period," where individuals decide whether to adopt or reject an innovation. This period is "an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation" (Rogers, 2003, p. 172). This process is characterized by five stages: knowledge, persuasion, decision, implementation, and confirmation. The rate of adoption is "the relative speed with which an innovation is adopted by members of a social system," in other words how quickly it makes its way through an individual's five-stage innovation-decision process (Rogers, 2003, p. 221).

Within a social system, individuals adopt innovations at a different rate depending on their own personal attributes, beliefs and level of "innovativeness". This rate follows what Rogers has dubbed the innovation "bell curve," so called because of the shape of the curve, with a slower adoption rate at the beginning and at the end of the adoption process, and a higher rate of adoption towards the middle (Rogers, 2003, p. 22).

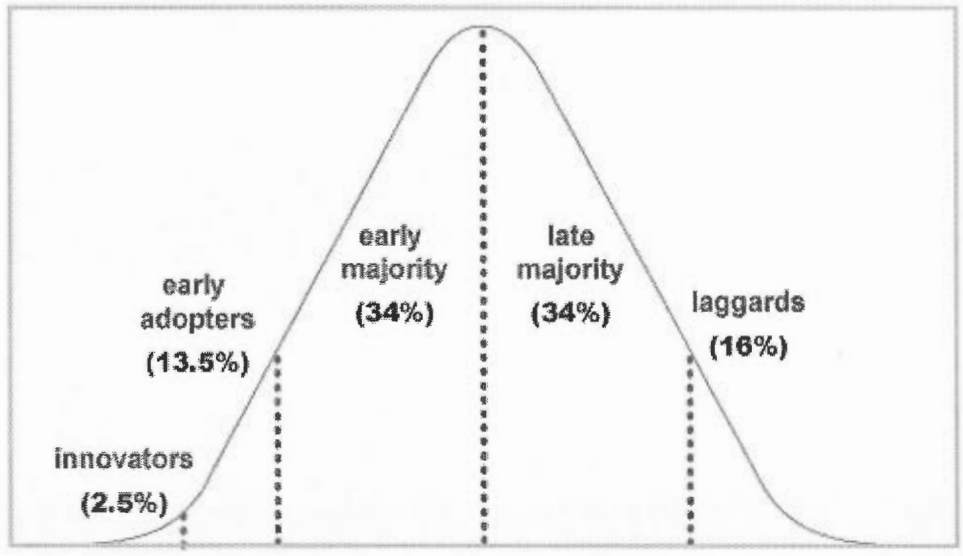


Figure 1.3. Roger's Diffusion of Innovations Bell Curve (2003)

Rogers identifies five categories of adopters according to the speed at which they adopt innovations. These range from the fastest adopters, known as innovators, followed by the early adopters, the early majority, the late majority, and finally, the slowest adopters, or

laggards (Rogers 2003, p. 282-5). It is beyond the scope of this paper to describe in detail the characteristics of individuals in each category, but it is important to note that those involved in the marketing, communication, or implementation of new innovations, including research, take into account such categories to tailor their messages to specific "adopters" across communication channels.

Despite having many similarities to the process of knowledge transfer, diffusion of innovation theory does not completely equate to it. For one, authors have mentioned that innovation and scientific knowledge are not necessarily synonymous. As Estabrooks (2006) states:

> "To use Rogers' model in health requires us to assume that the innovation in classical diffusion theory is equivalent to scientific research findings in the context of practice, an assumption that has not been rigorously tested" (p. 29).

Rogers' model has also been criticized for being uni-directional (i.e. moving from innovators to adopters[19]) (Havelock, 1969), thus lacking the back-and-forth nature of most knowledge translation interventions. As such, the classical 'Diffusion of Innovations' model is seen primarily as a push model, where innovators push their innovations to potential users. Furthermore, "diffusion" has been associated to a passive method of transfer, or "the uncontrolled, natural spread... of new knowledge, ideas, policies and practices" (Green et al., 2009)[20].

Despite all of these criticisms, Rogers' work has influenced many of the contemporary knowledge transfer theories, some of which consider more active (push and pull) models, and most of which are multi-directional.

---

[19] Or, unilaterally from adopters to innovators in the form of "feedback," although we have not described this process here.

[20] We will contrast this in the next section with a review of the terms "dissemination" and "implementation."

1.1.3.3.2. Havelock's classification

Most notably, Rogers' work influenced Havelock and colleagues in the 1960s, with their comparative study of the literature on the dissemination and utilization of knowledge. Havelock *et al.* (1969) developed a new way of looking at knowledge diffusion and dissemination and came up with a framework for Research, Development, Diffusion and Utilization. Within their framework, they described three distinct models of dissemination-utilization (the "problem-solver model", the "research, development and diffusion (or RD&D) model", and the "social interaction model"). Combining elements of all three of these models, Havelock *et al.* created the integrative "linkage" model of knowledge transfer. All of these models will be looked at next, along with a discussion of modern developments for each.

1.1.3.3.2.1. Problem-solving model

According to Havelock et al. (1969), the problem-solving model of knowledge transfer assumes that practitioners (or potential users) are those who dictate whether they will use knowledge/research, based on their need for this knowledge or research. In other words, for knowledge to be utilized, it must respond to a need (i.e. solve a problem). Research begins as a set of answers to specific problems (p.2-42). There is a "pull" for its existence by potential users.

> "The focus of this model is on the felt need of the client or user, based on the psychological assumption that the purpose of utilization is to apply a solution to reduce the need" (Love, 1985, p. 350).

Havelock describes a five-step "Need Reduction Process" (p.2-41), involving: 1) needs identification, 2) articulation of the problem, 3) search for solutions, 4) selection of the best solution, and 5) implementation of the retained solution to satisfy the need.

As such, this model is user-oriented, but as Havelock explains, collaboration and reciprocal communication must take place between knowledge producers and users so that

knowledge producers are aware of users' needs and tailor their work accordingly. Like other theories on planned change[21], Havelock states that in the problem-solving model of knowledge transfer, the users' self-initiation of the need reduction process will result in greater, longer-lasting adoption of the solution.

1.1.3.3.2.2. Research, Development and Diffusion (RD&D) and Diffusion, Dissemination and Implementation

The second model identified by Havelock et al. is the RD&D, or research, development and diffusion process model. This model is the opposite of the problem-solving model because it assumes that knowledge transfer starts from the research and product of this research, eventually "pushing" its way to potential users. As Havelock et al. state, the basic premise (if somewhat caricatured) of this model is:

> "If the knowledge is there, a user will be found for it" (p.2-41).

Unlike the previous model, which took into account the needs of knowledge users, and where meeting those needs was the primary motivator of research, in the RD&D model, needs are only secondary and often not considered until the "development" stage of the process. Indeed, in the first stage, knowledge producers focus of the advancement of knowledge and start research as "a set of facts and theories about the nature of the universe" (p.2-42). Then, in the "development" phase, these theories, facts and data are used to generate potentially useful products and services. Prototypes are created and tested and once ready, these are "diffused" at large.

According to Havelock, the diffusion process in this model is systematic, but not necessarily explicit:

> "Usually there is only a dim understanding of how the knowledge gets transformed into something useful, but the firm belief remains that somehow it filters down" (p.2-42).

[21] See, for instance, the work of Lewin (1951), and Lippitt, Watson and Westley (1958).

Lomas (1988; 1993), built on the RD&D model looking at knowledge diffusion, but described it as a three-step process (diffusion, dissemination and implementation), where each step progressively becomes more active in translating research into practice. He views "diffusion" as a "passive subset of dissemination in which no special efforts are made to promote the spread of knowledge" (i.e., the publication of findings in peer-review journals). "Dissemination" goes one step beyond and is "the spread of knowledge from its source to... practitioners. It includes any special efforts to ensure that practitioners acquire a working acquaintance with that knowledge." In other words, dissemination aims at providing awareness of the existence of knowledge. It goes beyond publication of research results and involves activities such as press coverage and targeted mailing, where messages are tailored to the needs of the expected audience. Lastly, "implementation" goes beyond communication simply to increase awareness. The most "active" of all of the steps, it involves "identifying and overcoming the barriers to the use of knowledge obtained from a tailored message" (Lomas, 1993, p. 227). It seeks to communicate research findings in many ways and through various media, making it hard for potential users to ignore. Beyond communication, implementation involves sanctions, rules, guidelines and consequences that mean research findings will be adopted.

1.1.3.3.2.3. Social Interaction

The third model described by Havelock et al (1969) is the social interaction model, which emphasizes the "diffusion" aspect of knowledge transfer, or the "measurement of the movement of messages from person to person and system to system" (p.2-42). It considers the importance of the social context and the norms, habits, influences and other determining factors that make up this environment.

In this model, knowledge "flows" from person to person through personal contact. Certain individuals, (i.e. "opinion leaders") have more clout and influence on the beliefs and actions of their colleagues involved in the knowledge transfer process (Becker, 1970). Within this perspective, knowledge diffusion and use stems from repeated exchanges between

individuals, including knowledge producers and users. Indeed, in their recent review of Diffusion of Innovation literature, Greenhalgh, *et al.* (2004) concluded that "knowledge depends for its circulation on interpersonal networks, and will only diffuse if these social features are taken into account and barriers overcome" (p. 607). As such, knowledge transfer is both a push and pull process (since it involves interaction from both sides), and it is an active process for all those involved.

1.1.3.3.2.4. Linkage (and Exchange) Model

Combining and synthesizing the three models mentioned above, Havelock et al. created what they call the "linkage model" of knowledge transfer. The basic premise of this model is that the successful transfer of knowledge between the "two communities" of research and practice[22], depends on ensuring formal linkages and exchanges between knowledge producers and potential knowledge users. According to Huberman (1990), early linkages between the two groups (i.e. at the time when research is being developed) facilitate knowledge translation.

Since these two groups are often incompatible (for reasons listed above in the "Barriers" section), outside individuals known as "change agents," "linking agents" or "knowledge brokers" or "translators" often must come into play to "bridge" the two communities. Havelock (1975, p. 327) describes these individuals simply as "people who can work in the middle between research and practice."

These "human intermediaries between the worlds of research and action" (Lomas, 2007, p. 131) are essential – along with the appropriate infrastructure (agencies and resources) – to reflect the social need for human interaction in the linkage and exchange model of connecting research to action.

---

[22] See the description of the "two communities" in the "Barriers to Knowledge Transfer/Translation" section above.

Recent studies have examined the use of "knowledge brokers" as a strategy for increasing the linkages between knowledge producers and users (van Kammen J *et al.*, 2006; Jackson-Bowers, 2006; Canadian Health Services Research Foundation, 2003). The main objective of these individuals (or groups, agencies, etc.) is to help the producer and user groups develop a mutual understanding of goals and cultures, and to help them collaborate with each other to identify issues and problems for which solutions are required, as well as facilitating the identification, access, assessment, interpretation, and translation of research evidence into local policy and practice (Dobbins *et al.*, 2009).

Indeed, the Canadian Health Services Research Foundation defines knowledge brokering as:

> "all the activity that links decision makers with researchers, facilitating their interaction so that they are able to better understand each other's goals and professional cultures, influence each other's work, forge new partnerships, and promote the use of research-based evidence in decision-making" (Lomas, 2007, p. 131).

These recent studies have highlighted the positive impact of the use of knowledge brokers in facilitating and improving communication and knowledge sharing between key stakeholders. They are also associated with facilitating learning; building capacity to locate, appraise, and translate evidence into the local context; improving the quality of evidence used in decision making; and increasing interpretation of research findings and implications for action (Dobbins *et al.*, 2009). However, knowledge brokering is not a straightforward process because building trust and relationships between the knowledge broker and the stakeholders takes time, effort, and certain personality traits on the part of the knowledge broker.

Lomas (2007) describes the following attributes and skills of knowledge brokers:

- Entrepreneurial (networking, problem solving, innovating)
- Trusted and credible
- Clear communicator

- Understands the cultures of both the research and decision making environments
- Able to find and assess relevant research in a variety of formats
- Facilitates, mediates, and negotiates
- Understands the principles of adult learning

The role of knowledge brokers is continually evolving. When Lomas (2007) surveyed over 400 Canadian health system knowledge workers, he found that these individuals spent about 30% of their time on knowledge transformation (reading and disseminating research) and 20% on intermediation (actually linking researchers and decision makers), and the remaining time, spent doing management duties or teaching, reflected the fact that this is often a part time role. Furthermore, quoting Gold, *et al.*, 2006), Lomas pointed out that about 30% of knowledge brokers were based in universities, about 10% in foundations or research funding agencies, and the remaining 60% in different levels of the health system.

Pawlowski and Robey (2004), contrast the knowledge broker to another aspect of the "linkage agent" model when they highlight the roles of "boundary spanners." According to them, boundary spanning "describes activities that occur at organizational boundaries, including internal boundaries that separate organizational subunits" (p. 648). Boundary spanners can be gatekeepers, "individuals who gather and translate information from other departments and disperse it to fellow team members"; scouts, who "[bring] information and/or resources into a group"; ambassadors, who "engage in political activities such as lobbying for support and resources, impression management, and buffering a group from outside pressure"; sentries, who "police the boundary by controlling the information and resources that external agents send into the group"; and guards who "monitor external requests for information and resources and determine how the group will respond" (p. 648).

Knowledge brokers typically conduct a range of boundary-spanning roles, including "scout" and "ambassador", but as Pawlowski and Robey (2004) explain, they "perform their roles not as members of a group but as external agents" (p. 649) or third parties. As third parties, knowledge brokers are neither part of the source/knowledge producer group nor of the recipient/potential knowledge user group. In short, in the linkage and exchange model of

knowledge translation, knowledge brokers, as external agents or groups, facilitate interpersonal linkages and decrease the "know-do gap."

1.1.3.3.3. The knowledge-to-action framework

It is important to note that in medicine, knowledge translation is a process that encompasses all the steps included between the creation of knowledge and its use, going beyond the act of "knowledge transfer". A useful "knowledge-to-action" framework was developed by Graham et al. (2006) to describe the steps in this process:

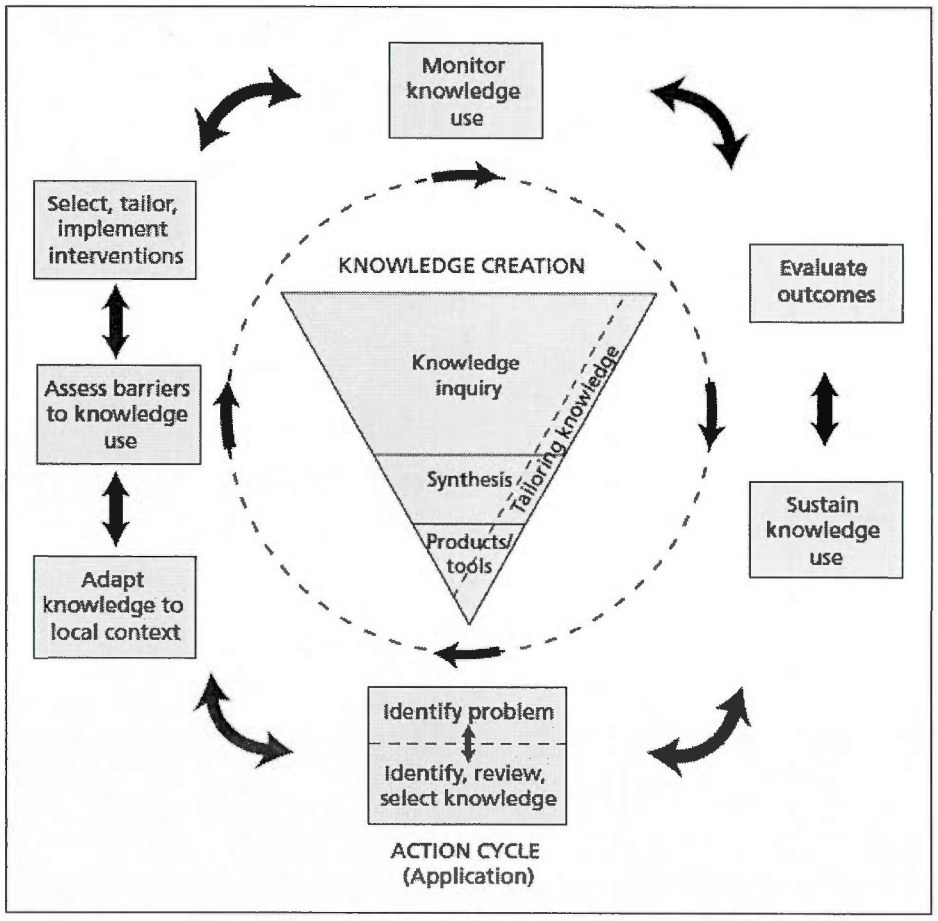


Figure 1.4. The Knowledge-to-Action Process, (Graham et al., 2006)

Graham's knowledge-to-action framework divides the process into knowledge creation and action. The knowledge-creation funnel at the centre of the diagram represents the sequential distillation of knowledge, from its raw (inquiry) form until it is further refined (into specific products and tools, such as clinical guidelines) to be used by potential stakeholders. On the outer edge of the diagram is the action cycle, which represents the activities needed to implement or apply the created knowledge, based on a planned-action approach[23]. The two processes (knowledge-creation and action) are dynamically linked and influence each other in transferring knowledge into action.

1.1.3.4. Knowledge Transfer/Translation Stakeholders and Context

An important element of knowledge translation is the fact that it "occurs in a complex social system of interactions among stakeholders" (Graham *et al.*, 2006, p. 16). These stakeholders include knowledge producers and knowledge users, along with the various individuals involved in the translation and implementation of knowledge.

On the knowledge producer end, we find researchers (individuals as well as research centres) and research funders, research councils, universities, professional associations, and governments, all of which mandate research (and other knowledge-producing) activities. On the knowledge user end, we find practitioners (such as doctors and other healthcare professionals), educators, policymakers and other decision makers, as well as patients, and the public at large, amongst others (Grimshaw, Ward, and Eccles, 2001). The involvement of patients in the healthcare system and in knowledge translation, notably, has been an area of focus for research in the last few years. Indeed, several authors have looked at patient-centred healthcare as a means of improving the quality of patient care, as well as aligning it with the needs and values of patients (Gagliardi *et al.*, 2011; Hobbs, 2009; Street *et al.*, 2009).

---

[23] As studied by Graham *et al.* (2006), the aim of planned-action theories of change is to "alter ways of doing things in social systems" by "deliberately engineering (not haphazardly) change in groups that vary in size and setting" (p. 20).

Stakeholders also range from the individual to the systemic level. Indeed, in knowledge translation, various levels must be considered, including: professionals, teams, organisations and systems of healthcare (Grol and Grimshaw, 2003), all of which may require different knowledge translation activities. Furthermore, the interactions between stakeholders may vary in intensity, complexity, and level of engagement depending on the nature of the research results and on the needs of the particular stakeholder (CIHR, 2007). If we refer back to Graham's knowledge-to-action framework, each phase of the "action" portion of the diagram could be accomplished by different stakeholders, and each of these phases could be used out of sequence depending on the project for which it was being used (Strauss, 2009).

Beyond the stakeholders actively involved in the knowledge transfer/translation activities, we must also consider the economic, political, social, technological and other contextual factors that may influence knowledge transfer. We will discuss these in greater detail in Chapter 4, which describes the research context utilized for this study. However, let us briefly examine these general contextual factors here.

Jacobson *et al.* (2003) looked at various elements of the "user group" and "research" contexts, including the structures and systems within which knowledge producers and practitioners reside. Among these, they mention the formal and informal structures within which these groups are embedded, the political climate surrounding these groups, and the entities to which the groups are accountable. Lomas (2000) described "formal" structures as legislatures, executive agencies and bureaucracies. Informal structures, according to Lomas (2000) are organizations of policy brokers such as citizen groups and stakeholder coalitions. The social characteristics of these formal and informal structures affect all knowledge transfer activities. For instance, Jacobson *et al.* (2003) note that knowledge transfer and utilization is more likely to occur in cultures that embrace "moralism and liberalism... [rather than] the maintenance of the status quo.

Beyond political structures and social/cultural elements, technology plays a large role in the success (or failure) of knowledge transfer/translation interventions. For one, issues of

access to technology within a society or group affect whether knowledge can be adequately transferred across time and space. New formats of CME/CPD using new technologies facilitate this transfer, such as online or live broadcasted CME/CPD.

1.1.3.4.1. Types of Knowledge Translation Interventions

Knowledge translation interventions can be viewed as improvements of medical decision-making and policies, specifically to address the clinical care gap. This has been called "evidence-based medicine" or, "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett *et al.*, 1996). Such evidence-based medicine is apparent in the design and implementation of clinical guidelines and other policies, where teams of experts rigorously and systematically review available knowledge (both scientific and patient-centred research)[24] before setting forth their recommendations. Lavis *et al.* (2009) described three types of products used in evidence-informed health policymaking, including summaries of systematic reviews, overviews of systematic reviews, and policy briefs, each review-derived products aimed at distilling information and making it more accessible to research users (including the medical community and policymakers).

According to the CIHR (2007), "knowledge translation strategies and activities vary according to the type of research to be translated (e.g., biomedical, clinical, health services and policy, and population and public health), and the intended user audience (e.g., primary users of research may be other researchers, front-line practitioners, health system managers, policy-makers, or the general public)." Similarly, Lomas (1997) explains that knowledge transfer requires a range of interventions varying in "complexity and resource intensiveness," depending on the intended user audiences.

Continuing medical education (CME) and continuing professional development (CPD) can be considered subsets of knowledge translation (Davis, 2003). Indeed, these educational

[24] See a discussion of evidence-based medicine in Eddy (2005).

activities are the main ways in which health professionals "maintain, improve, and broaden the knowledge and skills required for optimal patient care and safety" (Légaré *et al.*, 2011). The next portion of this study discusses issues and recent developments in CME/CPD, highlighting the various stakeholders involved in this knowledge transfer/translation process, along with the adult learning theories that surround it.

1.2. Continuing Professional Development

> "[Knowledge] workers have two main needs: formal education that enables them to enter knowledge work in the first place, and continuing education throughout their working lives to keep their knowledge up to date. For the old high-knowledge professionals such as doctors, clerics and lawyers, formal education has been available for many centuries... What is different this time is the need for the continuing education of already well-trained and highly knowledgeable adults. Schooling traditionally stopped when work began. In the knowledge society it never stops" (Drucker, 2001).

A great part of knowledge transfer takes place through formal learning that occurs during regular primary, high school, university or other preparatory, pre-professional education. However, as the opening quote to this chapter portrays, after graduation, knowledge quickly becomes outdated, if not obsolete. New discoveries, emerging technologies, continuously evolving knowledge bases – as previously discussed, these are the demands and rapid changes inherent to our knowledge society that highlight the necessity for knowledge workers to maintain an adequate level of current knowledge and proficiency in their given professions. As such, many professional associations and regulatory agencies[25] require professionals to continue their education and prove their level of knowledge, skills and performance in order to maintain or renew their professional title, licence, qualifications, certification, credentials and their right to practice, *after formal schooling*.

One strategy used for this ongoing knowledge transfer is known as continuing professional development (CPD). Although CPD activities can take on several different forms (discussed later in this chapter) and are presented under a variety of headings[26], their basic objectives remain the same:

> "To enable practitioners to keep abreast of new knowledge, maintain and enhance their competence, progress from beginning to mature practitioners,

---

[25] See, for instance, the professional associations of accountants, social workers, pharmacists, teachers

[26] Indeed, continuing professional education, lifelong learning, lifelong education, continuing professional development, further education, recurrent education, permanent education and continuing studies are all terms used (often interchangeably) to describe education or training of adults that goes beyond the scope of regular, compulsory, full-time schooling (Osborne, 2003).

> advance their careers through promotion and other job changes, and even move into different fields" (Queeney, 1996, p. 698).

In his landmark book, *Continuing Learning in the Professions*, Houle (1980) developed two models to portray professional education throughout life. Figure 5 is Houle's "Classic Model of Professional Education," which illustrates the long-term nature of continuing professional education when compared to the other, shorter stages of pre-professional education. He further developed this model (see Figure 6), by describing the more flexible conception of work life, which includes career changes and periods of preparation and induction to new responsibilities, all of which should be taken into account with CDP. This second model is the one retained for the purposes of this research.

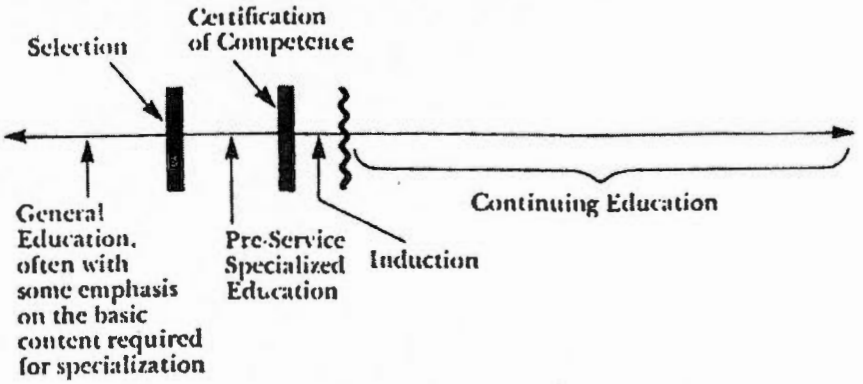


Figure 1.5. The Classic Model of Professional Education (Houle, 1980, p. 4).

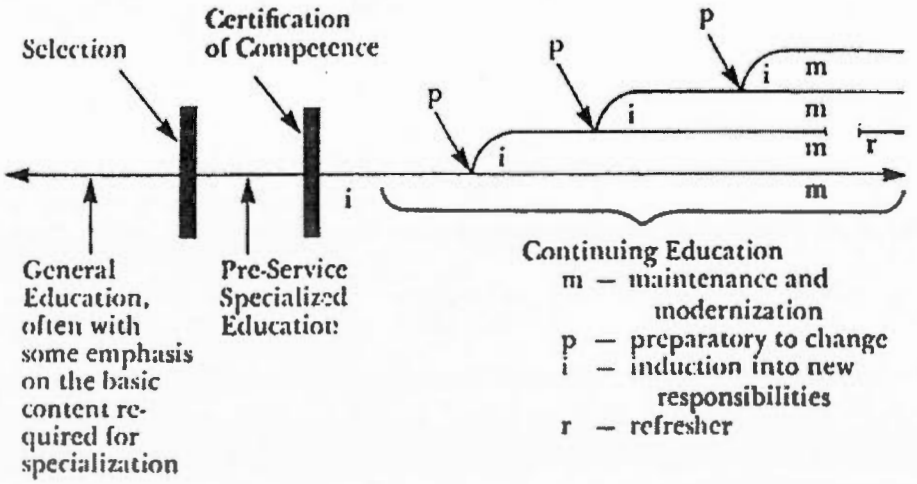


Figure 1.6. An Emerging Model of Professional Education (Houle, 1980, p. 106).

1.2.1. Beginnings and developments of Continuing Professional Education

> "An incredible amount of resources, both financial and human, are used to support the three to six years of professionals' initial education. Until recently, however, little systematic thought was given to what happens for the following forty years of professional practice."
>
> – Ronald M. Cervero (2000)

In the above quote, Cervero describes how in comparison to organized, formal, pre-professional education systems (universities, established curricula, etc.), systems for continuing education for professionals have only recently started to emerge. However, Houle (1980) predicted since the 1980s that continuing education would grow "to the point where it would rival pre-service professional education" (Cervero, 2001).

The concept of continuing professional development has been around since the apprenticeship and guild systems of the middle ages (Queeney, 2000). As Jarvis and Griffin (2003) describe through Timothy Claxton's and other accounts, the Mechanics' Institute movement in America, Great Britain and Canada were examples of the emergence of continuing education in the nineteenth century, during which:

> "The idea of self-improvement led to the formation of many kinds of adult education provision: societies, charitable associations, libraries, and philosophical institutes, which offered a wide range of reading rooms, lectures and classes to artisans and small traders. They laid particular stress on the diffusion of scientific knowledge and temperance..." (Vol. III, Part 1, p. 3).

Current policies and regulations stem from the professionalization of workforces in the twentieth century (Cervero, 2001), the competence movement (Hervey, 1994) and sweeping technological, social and political changes following the World Wars, in the 1960s and 1970s (Queeney, 2000, p. 375). At that time, "the public perception of professional responsibility, accountability, and service was called into question by government agencies, consumers and the professions themselves" (Azzaretto, 1990, cited in Queeney, 2000, p. 375).

Cervero (2001) describes the subsequent growth of CPD in the latter half of the twentieth century:

> "The 1970s saw the beginning of what is now widespread use of continuing education as a basis for relicensure and recertification (Cervero and Azzaretto, 1990). By the 1980s, organized and comprehensive programs of continuing education were developed in engineering, accounting, law, medicine, pharmacy, veterinary medicine, social work, librarianship, architecture, nursing home administration, nursing, management, public school education, and many other professions (Cervero, 1988). During that decade, many professions developed their systems of accreditation for providers of continuing education (Kenny, 1985)." (p. 17-18)

It is important to note that issues related to re-licensure, re-certification, and accreditation of CDP providers remain important today. These will be discussed in Chapter 4 (the description of the research context utilized for this study), especially with regards to the English healthcare system.

1.2.2. Continuing Professional Development in Medicine

Unsurprisingly[27], the first attempts at conceptual schemes for CPD were in the medical field. This was in the United States, in the 1920s. The first mandatory "continuing medical education" (CME)[28] program was put in place in the field of urology in 1934 (Uhl, 1992). The 1940s saw the initiation of a credit system by the American Academy of Family Physicians for participation in CME programs. Credit systems are still the prevalent form of CME used today. These systems involve giving physicians a certain number of "credits" or "points" for

---

[27] This occurred due to the early professionalization of the medical profession vs. other professions, and "due to the widening gap between medical care provided by well-trained and up-to-date physicians and that provided by those whose learning ended with their formal medical degree" (Sriharan *et al.*, 2009).

[28] In medicine, CPD was long known as "Continuing Medical Eduation" or CME. It was not until the mid-1990s (IOM, 2010) that the term "CPD" gained widespread use in medicine, alluding to the fact that physicians need to develop professional skills going beyond "medical education." These involve management, ethical decision-making, communication and other interpersonal skills relevant to the medical profession. (See, for instance, the Royal College of Physicians and Surgeons of Canada's Canadian Medical Education Directions for Specialists 2000 Project (CanMEDS 2000), entitled "Skills for the New Millennium" (Frank JR, *et al.*, 1996) and the elements of "Good Medical Practice" (UK General Medical Council, 2006).

each hour (or other unit of time) of CME activity completed. A minimum number of credits must be completed per year (or review period).

During the 1960s, physicians were beginning to be recognized for their involvement in CME programs (American Medical Association, 2011), and efforts were being made to improve CME as a whole, as described in Dryer's Report of the Joint Study Committee in Continuing Medical Education from 1962, entitled "Lifetime Learning for Physicians" (Cervero, 2000; Dryer, 1962). The Joint Study Committee consisted of representatives from the American Medical Association and other organizations, brought together to discuss concerns regarding the quality of medical care as well as the advancement of knowledge and competence of physicians – these issues are also still pertinent today.

In the 1970s, the World Health Organization (WHO) also recognized the importance of setting up national systems of continuing education for health professionals throughout the world, saying that these should "be based on the national and local health needs and demands, integrated with health care and educational systems, with full utilization of the resources of universities and schools of health personnel" (WHO, 1996, p. 1). Furthermore, it proposed having systematic approaches to assessing "the quality of performance of health personnel."

Such formalized systems have emerged in the past few decades in most developed countries, recognizing that up-to-date knowledge is essential to promote intrapersonal and professional competence, high quality care, and patient safety (Epstein & Hundert, 2002). In the United States, the Accreditation Council for Continuing Medical Education (ACCME) was established in 1981 to oversee the accreditation of national and interstate CME providers. At that time, state legislatures, licensure boards and specialty boards all began requiring CME participation for re-licensure and re-certification.

In Canada, the College of Family Physicians of Canada (CFPC), which had been accrediting continuing medical education since 1954, launched its first maintenance of certification program in 1975. Its official program, Mainpro (Maintenance of Proficiency), a time-limited

certification and membership program, was inaugurated in 1995. In order to maintain college membership, physicians were (and are still) required to obtain a certain amount of CME credits per review period (CFPC, 2011a). Similarly, the MOCOMP (Maintenance of Competence) program was established in 1987 by the Royal College of Physicians and Surgeons of Canada (RCPSC), requiring specialist physicians to earn a set number of CME credits in order to keep their RCPSC fellowship. It was later changed to MAINCERT (or Maintenance of Certification, "MOC") (RCPSC, 2011a).

In the United Kingdom, the General Medical Council began overseeing CME activities as of the 1980s, under the Medical Act. The Royal Colleges of Physicians officially established CME in 1996. Nowadays, the national accreditation authority for CPD in the United Kingdom is the Academy of Medical Royal Colleges, in association with the General Medical Council. Each Royal College and Faculty within the Academy must meet the "Ten Principles of CPD" in carrying out their CPD activities[29].

1.2.2.1. Regulatory and Accreditation Bodies

CPD activities are governed by the medical profession (in the form of medical societies or associations) or by a combination of the medical profession and the government (Peck, *et al.*, 2000). These entities set the minimum CME/CPD requirements for physicians to complete. This can include demanding that physicians participate in a certain number of hours of CME/CPD per given time period (i.e. gaining a certain amount of credits per year), that they spread their CME/CPD learning in several categories (group activities, self-directed learning, enduring materials, etc.), and that they report their "credit status" or their accumulated participation in CME/CPD for a given time period, which is then reviewed.

Certain medical societies (and regulatory bodies) operate on five-year cycles (or review periods) for the revalidation of member physicians (Peck, *et al.*, 2000). The revalidation

[29] We will discuss specific contextual issues pertaining to Canada, the United States and England in Chapter 4.

process involves demanding that doctors validate or prove their "fitness to practice" in order to continue to practice for a defined period (known as relicensure, or, renewing their license) or to maintain their specialist certification (recertification). Adequate participation in CME/CPD is part of that revalidation process in the United States and less formally in the UK (in preparation for the official start of the revalidation program as of late 2012[30]) and in Canada.

1.2.2.2. Providers and Organisers

Providers of CME/CPD activities and products include both commercial and scientific entities, such as university CME offices, physician (GP and specialist) associations, medical societies, as well as accredited third-party for-profit and not-for-profit agencies and medical education communication companies (Peck, *et al.*, 2000). These can be international, national, regional or locally-based entities, which are either in charge of organizing or providing logistic support for the various CME/CPD activities they are involved in.

CME/CPD providers and organisers are the "link" between knowledge sources, such as research centres, and physicians. They must be evaluated, approved and accredited by specific accrediting bodies in order to be able to grant physicians "credits" for the participation in their CME/CPD activities. Providers are only accredited if they meet certain quality, education, independence of commercial support and other standards. Additionally, they must follow certain guidelines regarding their formats: stating the learning objectives of the activity at the beginning, having any speakers declare their potential conflicts of interest, remaining balanced and steering clear of bias with regards to discussions on treatment options or specific products, etc. Appendix A is an excerpt from the CFPC Guide to Mainpro, (CFPC, 2011b, p. 13-15), which shows Mainpro-M1 Accreditation Eligibility Criteria, guidelines and expectations of CME/CPD providers.

---

[30] Described in detail in Chapter 4 – The Research Context.

1.2.2.3. Types of CME/CPD

CME/CPD activities are varied in format, scope and nature. Historically, continuing medical education was often associated to didactic lectures and seminars, educational methods which have been criticized for their lack of interactivity (Davis, *et al.*, 2008). Nowadays, with the advent of new technology, such as live broadcasts over the internet, and with greater knowledge of adult learning principles[31], CME/CPD delivery methods are more and more learner-based, more flexible, more interactive and more relevant to the needs of physician participants. Table 1 below gives an overview of the various types of CME/CPD available, separating these in three categories (live events, enduring materials, and self-directed learning). Live events involve accredited or non-accredited group learning activities. Enduring materials are those that can be consulted at any time. Self-directed learning involves self-assessment and practice reflection, along with teaching and other standard-setting activities. This compilation has been amassed from a variety of sources, including Davis, *et al.* (2008), RCPSC 2011a,b, and CFPC 2011.

Live Events	**Enduring Materials**	**Self-Directed Learning**
Conferences	Printed educational material	Self-assessment programs
Refresher courses	CD-ROMs and other computer-based CME	Simulation
Seminars	Audiotapes	Learning portfolios
Lectures	Internet-based programs	Traineeships
Workshops		Masters and PhD studies
Symposia		Practice audits
Rounds		Patient surveys
Educational meetings		Care appraisal studies
Journal clubs		Publications
		Preparation of presentations, teaching examinations
		Research
		Guideline development

Table 1.1. A summary of CME/CPD formats and activities

[31] Adult learning theories are described in Section V below.

1.2.2.4. The current state of CME/CPD

CME/CPD systems have grown and changed dramatically in the last decade. In the United States, for instance, "the CME enterprise has grown significantly since 1998, with 10% more accredited providers, 40% more activities, 10% more hours of instruction, and 40% more physician participants" (Lowe, 2009). Furthermore, several attempts at reform have been implemented worldwide, in an effort to help "health professionals keep up with knowledge, science, and technology that constantly evolve" (Caron, Beaudoin, Leblanc, & Grant, 2007). We will discuss these reform programs and specific CME/CPD strategies in Canada, the United States and England in Chapter 4 of this study.

One of the main changes in CME/CPD is that it has become its own distinct field of study and practice, as can be seen through the growing body of literature on various aspects of the field, and through the peer-reviewed journal expressly devoted to this topic, the *Journal of Continuing Education in the Health Professions.* In his analysis of continuing professional education between 1981 and 2000, Cervero (2001) identified five key trends that have changed the face of the field, all of which apply to continuing medical education and professional development:

> Trend 1: the amount of continuing education offered at the workplace dwarfs that offered by any other type of provider, and probably all other providers combined
>
> Trend 2: an increasing number of programs are being offered in distance education formats by universities, professional associations and for-profit providers
>
> Trend 3: there are increasing collaborative arrangements among providers, especially between universities and workplaces
>
> Trend 4: the corporatization of continuing education has increased dramatically
>
> Trend 5: continuing education is being used more frequently to regulate professional practice (p. 19-24).

Cervero also discussed three fundamental issues to be negotiated in building systems of continuing education:

> Issue 1: continuing education for what? The struggle between updating professionals' knowledge versus improving professional practice
>
> Issue 2: who benefits from continuing education? The struggle between the learning agenda and the political and economic agendas of continuing education
>
> Issue 3: who will provide continuing education? The struggle for turf versus collaborative relationships (p. 25-28).

As can be seen through Cervero's list of trends, contextual elements are an important factor in the continuing education process. Indeed, discussions of political, social and other contextual influences on the continuing education and development of physicians, along with a description of the various stakeholders involved in the process, will be discussed in more detail in our conceptual framework (Chapter 2 of this study), as well as our description of the research context (Chapter 4). For now, let us describe the goals (or expected outcomes) of medical CPD.

1.2.3. Outcomes of CME/CPD

The ultimate goal of CME/CPD is to "help physicians acquire and apply scientific knowledge, demonstrate skill, and perform effectively as caregivers" (Miller, 1990). In continuing education vocabulary, this is known as the "outcome" of the CME/CPD activity, or the impact it has on physicians, patients and the healthcare system as a whole. As defined by Alfonso Negri at the European CME Forum (2008), an outcome is "a change of knowledge, skills, attitude or behavior as a result of participation in a CME/CPD activity" (slide 14).

In educational settings, most learning evaluation methods are based on Kirkpatrick's 4-stage evaluation framework (Légaré, 2011). As portrayed in Figure 7 below, Kirkpatrick's model assesses training effectiveness by "measuring participants' reactions to an educational activity (level 1); changes in participants' knowledge, skills, or attitudes (level 2); transfer of learning to practice/observed changes in behaviour (level 3); and finally, the results of the newly acquired behaviour on organizational outcomes such as productivity and quality (level 4)" (Légaré, 2011, p. 2).

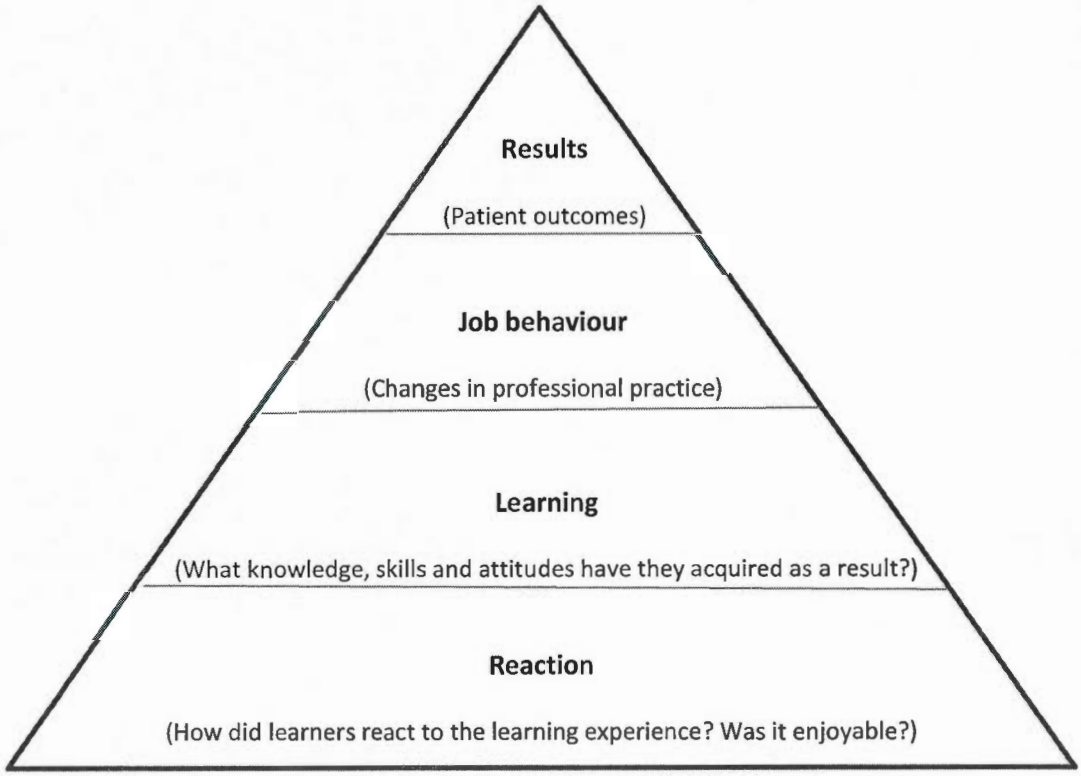


Figure 1.7. Kirkpatrick's Evaluation Framework (1994).

Another traditional way of "measuring" or showing this change in knowledge, skills, attitude and behaviour was through Miller's (1990) pyramid of clinical assessment, shown in Figure 8 below. Miller stated that although "no single assessment method can provide all the data

required for judgment of anything so complex as the delivery of professional services by a successful physician" his pyramid was a framework within which that assessment could take place (p. S63).

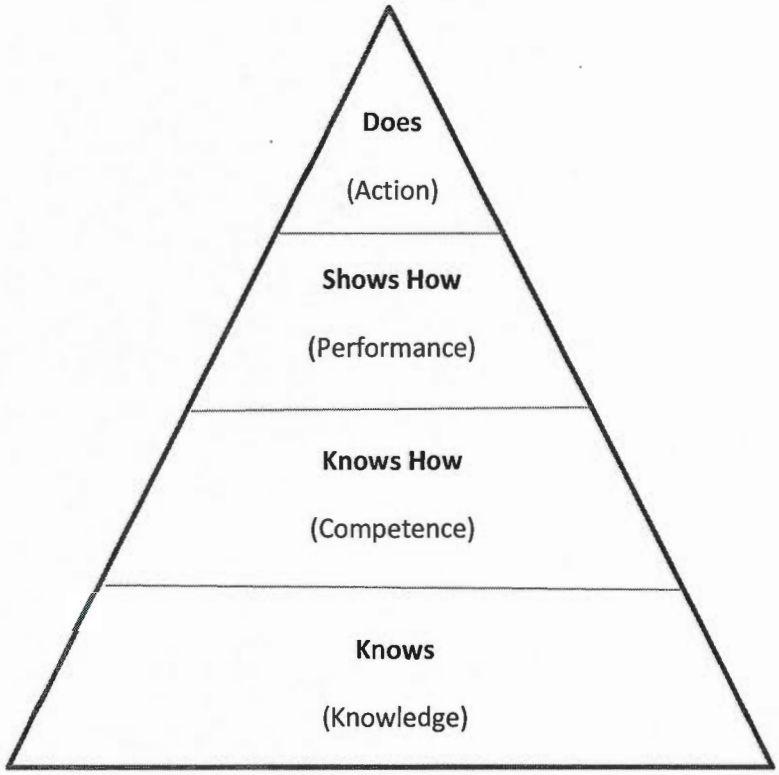


Figure 1.8. Framework for Clinical Assessment (Miller, 1990).

Miller states that within his pyramid, most educational evaluation methods remain at the first level (the base) of his pyramid, where only knowledge is evaluated. However, this evaluation is not sufficient and Miller quotes Alfred North Whitehead saying that "there is nothing more useless than a merely well informed man" (p. S63). Indeed, Miller states that physicians must be functionally adequate (i.e. competent) in being able to apply the knowledge they have gained. The third and fourth levels require more complicated methods of evaluation and are often inadequately looked at because of this. Level 3 ("Shows How") attempts to evaluate a physician's thought process by testing what they would do in the

face of a certain situation. Level four ("Does") aims to examine what physicians actually do in a real, clinical setting (i.e. not in an evaluation).

Moore (2007) moves beyond the impact on physicians and describes seven environment-based outcome levels upon which CME can be evaluated. These range from the individual level to the more systematic, population health level. Table 2 defines and describes each of the expected outcomes for these levels below.

Level	Outcome	Definition
1	Participation	Number of physicians/others who registered and attended
2	Satisfaction	Degree to which participant expectations about the setting/delivery of CME activity were met
3	Learning	Changes in knowledge, skills, and/or attitudes of the participants
4	Competence	Changes in knowledge, skills and behaviour utilized to improve performance
5	Performance	Changes in practice performance as a result of the application of what was learned
6	Patient Health	Impact on patient health status due to practice behaviour changes
7	Population Health	Impact on population health status due to changes in practice behaviour

Table 1.2. Levels of Outcome-Based CME Evaluation Model (Moore, 2007, p. 251).

As Sherman (2008) states, present-day CME/CPD activities are normally evaluated on Moore's Outcome Levels 1-3 (Participation, Satisfaction, and Learning), but CME/CPD providers should strive to move beyond this to Levels 4-7 (Competence, Performance,

Patient Health, and Population Health), which have a greater impact and more positive outcomes for the population at large. Légaré, *et al.* agree that higher degree outcomes are being overlooked, stating that most CPD providers only assess Kirkpatrick Level 1 and 2 (participation and learning) outcomes "using pre- and post-activity self-administered questionnaires" (p. 2). In short, Légaré states that "CPD providers are still struggling to find reliable ways to measure these impacts on a routine basis." Part of this issue is in the way CME/CPD activities are created, a process we will look at next.

1.2.4. CME/CPD Progam Planning

As Davis, *et al.* (2008) state, strategic planning in CME/CPD "includes understanding learners' needs as well as those of the healthcare system and population healthcare needs" (p. 654). This is known in the educational realm as a "needs assessment," defined as:

> "A process of acquiring and analyzing data that reflect the need for a particular educational activity. An evaluation of the difference between current and required knowledge, skills, attitudes or behaviours - used to determine priorities in developing educational activities and their defined learning objectives" (Royal College of Psychiatrists, 2007, p. 6).

Davis, *et al.* (2008) distinguish between subjective and objective needs assessments, the former of which are considered less accurate than one might hope (Norman, *et al.*, 2004 in Davis, *et al.*, 2008). Subjective needs assessments include questionnaires, focus groups or individual interviews, reflection-on-action methods, and diaries or log books completed by physicians themselves. This is known as "self-assessment" (i.e. physicians identify their needs themselves). More objective methods include literature reviews, opinions of experts in the field, standardized assessments of knowledge and/or skills, chart/case-study audits, peer review (whereby doctors assess each others' practice), standardized patients to rate task performance, observation of physician practices, and reports of practice patterns and physician performance data (Davis, *et al.*, 2008, p. 654-5).

Once the needs are researched and poinpointed, providers must establish the ultimate goal (outcome) of the CME/CPD program. As we've discussed earlier, outcomes can be based on knowledge, skills, and changes in behaviour and attitude. Davis, *et al.* (2008) describe five different expected endpoints: introduce new concepts, give specific practice recommendations, provide opportunity for discussion of controversial issues, teach new procedures with hand-on practice, and document competence in a new skill. Normally, CME/CPD activities are preceded by a list of "learning objectives," defined as:

> "An intended educational outcome for an activity held by an event provider, relating to skills, knowledge and/or attitude/behaviour gained by participants at the event. These should clearly describe what the learner will know or be able to do after participating in the CPD activity" (Royal College of Psychiatrists, 2007, p. 6).

Each of these types of expected outcomes or learning requires specific tailoring of the CME/CPD activity. This includes the content and the format of the activity (formal/informal, live/enduring, self-directed).

Lastly, CME/CPD providers (and accrediting bodies in charge of overseeing the quality and content of the activities and programs produced by these providers) must put in place a process for evaluating the ability of the program to meet physician needs and expected learning objectives. Furthermore, as Davis, *et al.* (2008) state, evaluations of CME activities must also take into consideration wider goals, such as whether these activities "satisfy learners, have favourable outcomes and meet financial goals" (p. 654). In order to create programs that meet physician and population needs, CME/CPD providers must take into account adult learning principles, which take into the specific demands of adult learners. We will describe some of the main adult learning theories in the next section.

1.2.5. Adult learning theories

There are many theories on adult learning principles, and this is an area of great interest for CME/CPD scholars. Indeed, adults learn in very particular ways, and concepts related to self-directed learning and reflective practice have been taken into consideration for the development of CME/CPD programs. For the purposes of this study, we will focus on the theories most relevant to physicians as lifelong learners, including those most often cited in our review of the literature.

Knowles (1975) is perhaps one of the most often cited authors on adult education, or andragogy, as he calls it. In his early work, he describes the characteristics inherent to learning adults. For instance, he says adult learners 1) are autonomous and self-directed; 2) have accumulated a foundation of experiences and knowledge; 3) are goal oriented; 4) are relevancy oriented; 5) are practical; and 6) need to be shown respect. Furthermore, Knowles states that adult learners are motivated by internal incentives, such as the need for self-esteem, the desire to achieve, the urge to grow, the satisfaction of accomplishment, the need to know something specific, and curiosity. All of these traits must be considered by those looking at adults as learners. In fact, Knowles describes the "self-directed learning process," where learning is self-initiated, foften practical and problem-solving-based, and where adult learners have power, influence and control over their learning experience. In this type of learning, which is the opposite to teacher-based learning, the learner's experiences and expertise are as important as those of his/her teacher. Used together, these experiences and expertise form an enriched learning environment, further enhanced by mutual trust and exchanges between the teacher and learner.

Schön (1987) and Kolb (1984), both describe the internal (reflective) learning process of the adult learner. Schön describes how adult professionals deal with the unpredictability and complexity of their everyday work life using three fundamental constructs: knowing-in-action; reflection-in-action, and; reflection-on-action. Schön describes knowing-in-action, a concept closely related to tacit knowledge or intuitive "know-how" as such:

> "There are actions, recognitions, and judgements which we know how to carry out spontaneously; we do not have to think about them prior to or during their performance. We are often unaware of having learned to do these things; we simply find ourselves doing them. In some cases, we were once aware of the understandings which were subsequently internalized in our feeling for the stuff of action. In other cases, we may never have been aware of them. In both cases, however, we are usually unable to describe the knowing which our action reveals" (p. 54).

Reflection-in-action is similar to the concept of "thinking on our feet," where a practioner can be surprised or confused while executing his/her job and can react to this surprise by changing the course of his/her actions. It is on-the-spot experimentation or "thinking about what you are doing as you do it." It allows practitioners to gain a new understanding of a phenomenon and to change their situation (p. 68). Lastly, reflection-on-action is done after an event has occurred. It involves thinking back about how knowledge was used in practice (knowing-in-action) and how reflection-in-action may have changed the outcome of a particular situation.

Kolb (1984) also describes experience as the source of learning and development. In his experiential learning cycle, Kolb outlines four sequential learning stages that practitioners go through in their learning process. These are portrayed in Figure 9 below. In the first stage, practitioners have a concrete experience (they "do" something). Then, they review and reflect on that experience. Next, they conclude and learn about that experience by forming abstract concepts about it. Finally, they try out these concepts in a new situation, testing and experimenting with what was learned previously. This cycle is a continuous one, where learning begins again at every new situation.

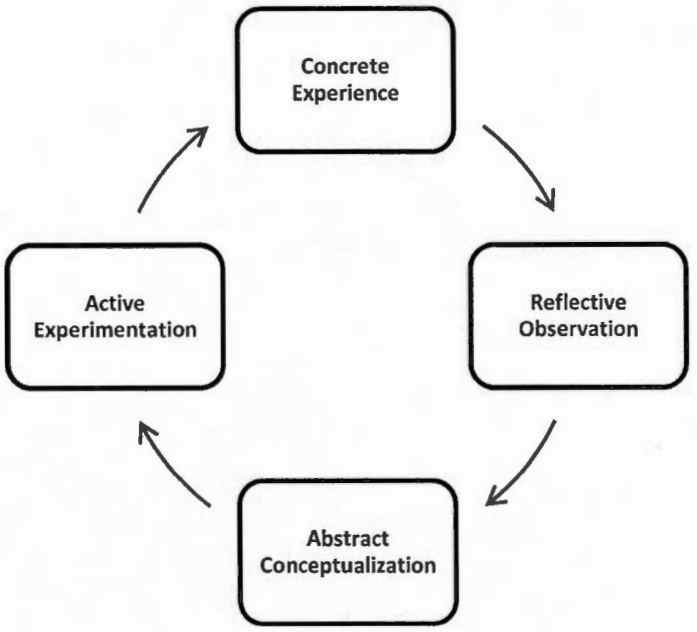


Figure 1.9. Kolb's Experiential Learning Cycle (1984).

In short, this selection of theories on adult learning principles describes the particular needs of adults as learners. Each of these theories stresses the importance of reflective and self-directed learning, aspects of which are apparent in CME/CPD processes today. In fact, most CME/CPD credit schemes include credits for independent study and self-directed learning, where physicians undertake their own activities which are approved and accredited for a certain amount of CME/CPD credit (Peck, *et al.*, 2000).

1.2.6. Constructivism

Adult learning principles and theories exist within a more global learning and knowledge theory called constructivism. Based on the work of Jean Piaget (1967) and Lev Vygotsky (1978), constructivist theory argues that learners generate knowledge (construct new perspectives about the world around them) from their experiences.

Piaget (1967), described the construction process as oscillating between assimilation and accommodation. On the assimilation side, he described how learning can happen when individuals interact with different things, concepts or relationships in their environment, thus incorporating these new "objects" into their existing personal internal knowledge constructs. Sometimes, individuals "accommodate" or alter existing knowledge constructs or past knowledge when confronting new experiences/objects. Whichever way this construction process comes along, the key in constructivism is that each individual is *active* in the learning process, not merely passively absorbing knowldege.

In social constructivism, Lev Vygotsky (1978) suggested that people learn through their interactions with others and their environment (social context) (Fosnot, 2005). Through dialogue, individuals engage with their surrounding community, which Vygotsky referred to as a "zone of proximal development" which can have an impact on the extent of cognitive development.

In his review of constructivism, Taber (2006, in Sjoberg, 2007) suggested a set of overarching assumptions describing constructivist theory in learning:

1. Knowledge is actively constructed by the learner, not passively received from the outside. Learning is something done by the learner, not something that is imposed on the learner.
2. Learners come to the learning situation (in science etc.) with existing ideas about many phenomena. Some of these ideas are ad hoc and unstable; others are more deeply rooted and well developed.
3. Learner has their own individual ideas about the world, but there are also many similarities and common patterns in their ideas. Some of these ideas are socially and culturally accepted and shared, and they are often part of the language, supported by metaphors etc. They also often function well as tools to understand many phenomena.
4. These ideas are often at odds with accepted scientific ideas, and some of them may be persistent and hard to change.

5. Knowledge is represented in the brain as conceptual structures, and it is possible to model and describe these in some detail.
6. Teaching has to take the learner's existing ideas seriously if they want to change or challenge these.
7. Although knowledge in one sense is personal and individual, the learners construct their knowledge through their interaction with the physical world, collaboratively in social settings and in a cultural and linguistic environment. (The relative stress on such factors account for the different 'versions' of constructivism earlier alluded to.)

Fosnot & Perry's (2005) description of constructivism summarizes the approach we have attempted to capture throughout this study:

> "Constructivism... construes learning as an interpretative, recursive, nonlinear building process by active learners interacting with their surround – the physical and social world" (p. 34).

This recursive, nonlinear learning will be highlighted in our conceptual framework, along with the interactions with others in the knowledge transfer and translation process and with the surrounding environment .

1.2.7. Summary of the Literature Review

We have now provided an overview of the main bodies of literature on continuing medical education and continuing professional development. We have described the evolution of CME/CPD into the discipline it is today. We have highlighted the various actors involved in CME/CPD, including regulatory and accrediting bodies, and event providers and organizers. We looked at different types and formats of CME/CPD and provided an overview of CME/CPD program planning, including needs assessments, learning objectives and measuring various levels of outcomes. Lastly, we highlighted the particularities of adult

learners, and their specific needs in terms of self-directed and reflective study, all within the realm of constructivism.

Together with the previous section on knowledge and knowledge transfer/translation theory and processes, we are now ready to provide the Conceptual Framework upon which the rest of this study is based. Each of the contextual elements and stakeholders described in the Conceptual Framework presented next is based on theories discussed in this chapter. Country-specific contextual and environmental elements will be described in detail in Chapter 4 (the Description of the Research Context).

CHAPTER 2
CONCEPTUAL FRAMEWORK

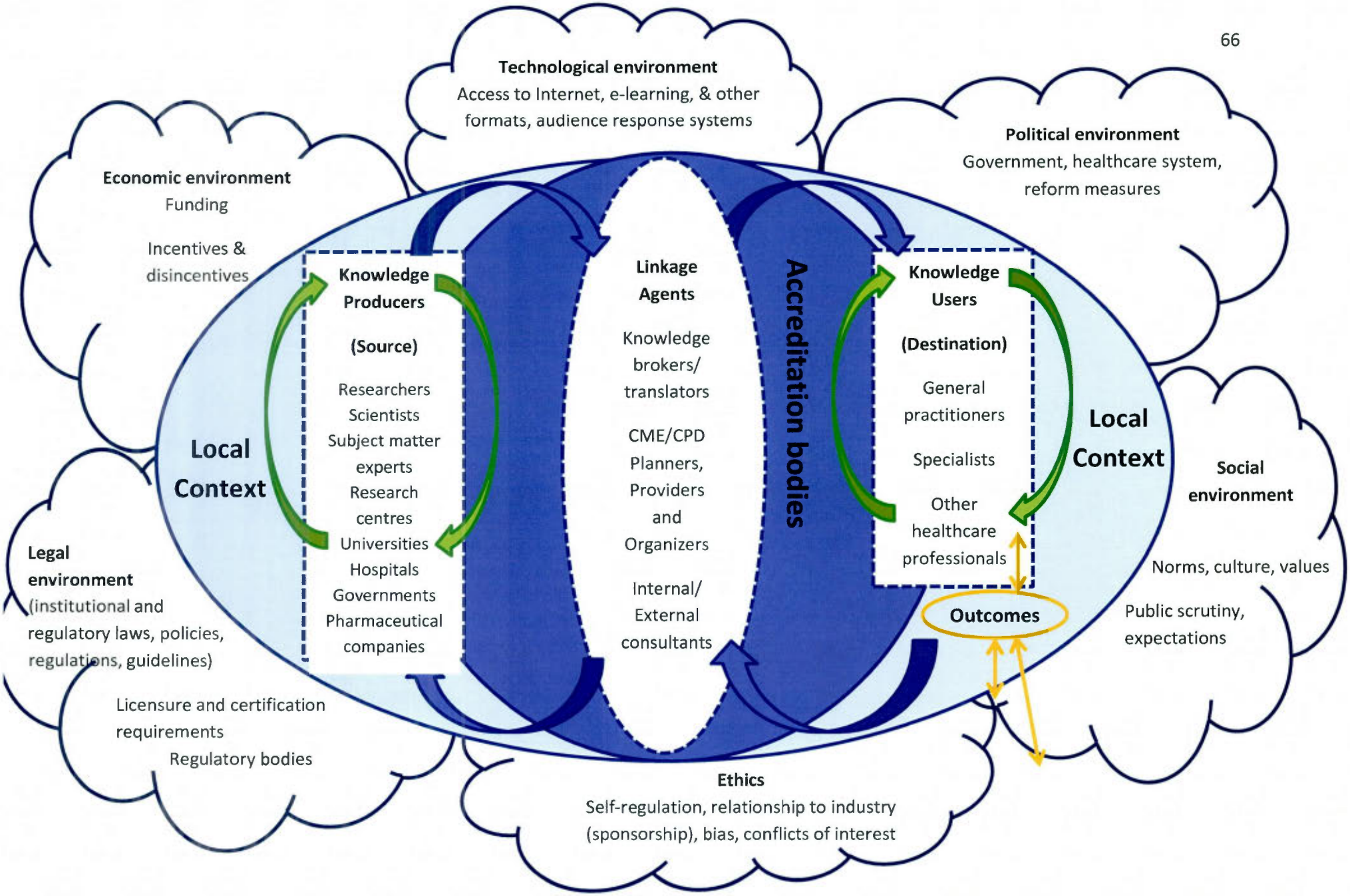
> "Physician learning is not static and should be approached with an appreciation for the unique contextual and environmental challenges and opportunities for learning within a complex healthcare system... Any CPD models or approaches to learning will need to consider social, cultural, financial, and contextual issues..." (Horsley, *et al.,* 2010).

In this section, we describe the cohesive conceptual framework upon which the rest of this study is built. Each aspect of this framework has been alluded to in our review of the literature on knowledge transfer and translation, and CME/CPD and adult learning (see Chapter 1). It is grounded in each of the theories we have discussed – communications theory (Shannon and Weaver, 1949), diffusion of innovations theory (Rogers, 2003; Greenhalgh, *et al.,* 2004), linkage and exchange theory (Havelock, *et al.*, 1969; Huberman, 1990), and finally constructivism (Piaget, 1967; Vygotsky, 1978; Fosnot, 2005), all of which exist in the knowledge-based view of society (Foray and Lundvall, 1996; OECD, 1996; Foray, 2000).

From Shannon and Weaver's (1949) basic communications theory and Rogers' (2003) diffusion of innovations theory, we have highlighted in our conceptual framework the four key elements of the knowledge transfer process: source (knowledge producer), content, medium (or communication channel) and knowledge user. Rogers' idea of a "social system" within which individuals "adopt" knowledge sits closely with Vygotsky's social constructivist notion of people learning through their interactions with others and their environment (social context) and Havelock's (1969) view of social interaction. The implications of this social context and interaction for adopting knowledge will be highlighted in the conceptual framework and in chapters beyond. We have used linkage and exchange theory (Havelock, *et al.*, 1969; Huberman, 1990) to emphasize the role of knowledge brokers as intermediaries

between knowledge producers and users. Lastly, Graham et al.'s (2006) "knowledge-to-action" framework has been used to highlight the move beyond simply transferring knowledge from producers to users into "translating" knowledge. This translation of knowledge (acquisition and application of transferred knowledge) has been illustrated using the CME/CPD concepts of "outcomes" and impact of knowledge.

It is important to note that we are looking at a very specific case of knowledge transfer/translation in the medical field – that which occurs during CME/CPD interventions, whether formal or informal, and irrespective of their format. For this study, we have concentrated on CME/CPD in three distinct areas: Canada, the United States and England. Descriptions of each of these countries will appear in the next chapter. For now, we will illustrate our conceptual framework in the form of a diagram and describe each of the individual sections, processes, and contextual elements below.


Technological environment
Access to Internet, e-learning, & other formats, audience response systems
Political environment
Government, healthcare system, reform measures
Economic environment
Funding
Incentives & disincentives
Knowledge Producers
(Source)
Researchers
Scientists
Subject matter experts
Research centres
Universities
Hospitals
Governments
Pharmaceutical companies
Linkage Agents
Knowledge brokers/ translators
CME/CPD Planners, Providers and Organizers
Internal/ External consultants
Accreditation bodies
Knowledge Users
(Destination)
General practitioners
Specialists
Other healthcare professionals
Outcomes
Local Context
Local Context
Social environment
Norms, culture, values
Public scrutiny, expectations
Legal environment
(institutional and regulatory laws, policies, regulations, guidelines)
Licensure and certification requirements
Regulatory bodies
Ethics
Self-regulation, relationship to industry (sponsorship), bias, conflicts of interest

2.1. Knowledge producers

As discussed previously in communications/diffusion of innovations view of knowledge transfer/translation, knowledge producers are the "sources" of knowledge. These are individuals from whom new knowledge emanates, or those that can reformulate existing knowledge in new ways. These can be individuals (researchers, scientists, or subject matter experts) or organisations (universities, hospitals, pharmaceutical companies, research centres, or even governments).

We have included dashes along the border of the knowledge producer rectangle to illustrate the various barriers and challenges to knowledge transfer that we have alluded to earlier. These include scientific jargon and academic formats used in the publication of research results, along with a lack of understanding of knowledge user needs and time restrictions, as well as a lack of motivation to share new knowledge, amongst others. All of these elements may delay (or even impede) the transfer/translation of knowledge to end users.

2.2. Knowledge users

At the other end of the communication/diffusion of innovations or knowledge transfer/translation process are knowledge users, those who acquire (and hopefully use) this new knowledge. In this study, these are doctors (either general practitioners or specialists) involved in CME/CPD.

We have again included dashes along the border of the knowledge user rectangle to portray the barriers to knowledge transfer that exist within this group. As discussed in the knowledge transfer/translation section, these occur at various levels. Individually, physicians may lack the motivation or skills to acquire (and utilize) new knowledge. They may also be resistant to change or new ideas. Organisationally, their team or workplace structures might be organised in such a way that limits access to CME/CPD (i.e. work overload, time, financial and other resource constraints).

2.3. Linkage agents

Individuals in this category provide the "link" between knowledge producers and users. They are "knowledge brokers" or facilitators, who are not necessarily content experts, but who understand adult learning and teaching principles. These include CME/CPD providers and internal or external consultants, individuals (and companies) are those who plan, create and organise CME/CPD interventions. They plan programs by making sure that users' needs assessments are accurately conducted. They ensure that learning objectives for specific activities are set, and that the outcomes of these activities are evaluated on more than just the basic (participation and learning) levels.

Again, the transfer/translation of knowledge surrounding this group is not perfect, as illustrated in the dashes in the border of the linkage agent oval. We have already mentioned issues pertaining to knowledge producer and knowledge user barriers. These individual, organisational and contextual factors also affect linkage agents, who may also be dealing with these issues. Furthermore, linkage agents are directly affected by adult learning (and teaching) principles. They must take into consideration the specific characteristics of adult learners (i.e. their motivation to learn and to solve problems, the need for relevance and autonomy, etc). Overlooking these elements may again delay or impede the transfer/translation of knowledge to end users.

2.4. The knowledge transfer process

We have illustrated the knowledge transfer process with blue arrows. Knowledge producers, linkage agents, and knowledge users are conceptualized as having two-way, communication, epitomized by the bi-directional arrows (representing communication and feedback in communication and diffusion of innovations theory and the recursive, nonlinear aspects of interaction as per constructivist theory). On the knowledge producer end, this communication and feedback occurs between knowledge producers and linkage agents, and between knowledge producers and end users. On the knowledge user end, two-way communication occurs with knowledge producers and with linkage agents. Indeed, we can

imagine this reiterative process taking place in informal discussions amongst colleagues and in formal meetings to address user needs. The arrows themselves represent knowledge transfer processes that can take on a variety of forms (formats or "media" to use the communication theory terminology), including: conferences, external courses, books / journals and other published (enduring) materials, informal discussions with colleagues, internal meetings, visits to other practices, teaching / giving lectures, internet-based learning, CD-ROM / audio / video materials, and simulation, amongst others.

2.5. The knowledge translation process

The green arrows in the conceptual framework highlight the knowledge translation process, areas where research is transformed via synthesis and implementation into practice. This iterative process occurs both on the knowledge producer side and on the knowledge user side, where conversations, discussions and debates take place, and where knowledge is transformed from one form to another. On the knowledge producer end, this often occurs with scientific (explicit) knowledge which is applied to and combined with new tacit or explicit knowledge to create new types of knowledge that can be transferred to knowledge users. On the knowledge user end, new explicit knowledge stemming from the knowledge transfer process is adapted and applied into practice.

2.6. Outcomes

We have discussed potential outcomes of CME/CPD interventions in detail in the second part of our literature review. Indeed, these activities can have an effect on physicians themselves (i.e. improving their knowledge, skills, attitudes and behaviours), making them better medical practitioners, in turn allowing for more positive patient and healthcare system outcomes (as discussed in the literature review with the work of Moore, 2007).

We have illustrated these potential outcomes with yellow bi-directional arrows. The first arrow shows that the outcomes can have an effect on doctors directly, who then have an

effect on other, more global outcomes. The other two-way arrows demonstrate these greater levels of potential impact of CME/CPD, including patient health and population health, within the local context and at the system-wide level (contextual elements such as economic, social, technological and other environments).

2.7. Accreditation bodies

We have added the dark blue circle representing accreditation bodies because these organisations are part of the local context and have a direct impact on the transfer/translation of knowledge in CME/CPD. For one, they oversee the approval and accreditation of CME activities produced and organised by linkage agents. Therefore, they have a direct say in the type, format, and content of CME/CPD activities that are available to physicians. They also oversee the credit attribution system as a whole, dictating which activities receive which number of credits. They set minimum standards for CME/CPD involvement, which affects physician participation rates in such activities.

2.7.1. The local context

The light blue oval in our conceptual framework represents the local context, specific to each CME/CPD knowledge transfer process examined in each country. By local context, we mean to emphasize the specific organizational and team-based issues faced by knowledge producers, linkage agents and knowledge users. These include team structures and workloads facilitating (or impeding) the flow of knowledge, and the availability of resources (people, materials, money) and time for knowledge sharing and acquisition.

We have also included in the notion of "local context" the various stakeholders who are directly affected by the knowledge transfer process. This means the local organisation (hospital, research centre, government agency, etc.) within which the individual (knowledge producer, linkage agent or knowledge user) operates, along with their team members and outside colleagues, as well as patients. Patient safety and the quality of care administered to

them is an especially important factor to consider in the CME/CPD knowledge transfer/translation process because the ultimate CME/CPD is to "help physicians acquire and apply scientific knowledge, demonstrate skill, and perform effectively as caregivers" (Miller, 1990).

2.8. The contextual elements

The environment surrounding the CME/CPD knowledge transfer/translation process has been illustrated using clouds, each representing one of the major subsections of this greater context. The use of clouds was deliberate, to portray the fact that no one "sphere" is disconnected from the rest, and each is diaphanous, continuously interconnected with the others. We have chosen to include the political, social, ethical, legal, economic, and technological spheres, all elements we found to have a direct impact on healthcare, research, and the transfer of knowledge in our review of the literature. Each of these sectors will be discussed in detail next.

2.8.1. Political environment

The political environment is perhaps the area of greatest influence on knowledge transfer/translation activities in CME/CPD. Within this sphere, we include governments (regional and national) as well as the pervading healthcare system infrastructure, which is directly influenced by political decision-making.

Indeed, there is a strong relationship between the political, economic, social, and ethical spheres. Political decisions regarding healthcare often compete (in terms of fiscal resources and agenda-setting) with other policy priorities (i.e. education, taxes, housing, etc.) for both the government and the public. Investments in research, health, and technology are decisions directly attributable to the political will and views of the parties in power. They also depend on the long-standing priorities, laws and orientations specific to a country. For instance, the healthcare model espoused by a country has a direct impact on the very

nature of the work and role of a physician, as well as his or her degree of involvement in CME/CPD.

2.8.2. Social environment

The social environment includes the pervading culture and demographics of a given country. These elements affect knowledge transfer/translation in a number of ways. Firstly, the overarching culture of education and improvement within a society will help in dictating which resources (fiscal, work leave, time, etc.) will be attributed to physicians to attend CME/CPD events. Furthermore, public interest, scrutiny and concerns over the variability in the quality of care and the safety of the healthcare environment (i.e. medical errors) will add increased pressure on the political and legal systems to regulate CME and CPD, in an effort to ensure that physicians are "fit to practice." Demographic issues such as an aging population can have a direct impact on doctors, intensifying their number of interventions and workloads (thus pushing doctors towards certain, more flexible formats of CME/CPD).

2.8.3. Ethical environment

Ethical and moral issues also impact the way CME/CPD knowledge transfer/translation processes are carried out. For instance, physician codes of conduct and codes of ethics limit the types of interactions doctors can have with industry (pharmaceutical and device companies, which are knowledge producers), to temper any possible conflicts of interest that may interfere with impartial and fair medical practice. These pharmaceutical and device companies themselves also have codes of ethics and modes of operation to try to minimize possible wrong-doings.

Furthermore, accreditation bodies have very specific standards and guidelines regarding commercial support of CME/CPD activities, as well as overseeing their actual content. Commercial entities are often not allowed to partake in the creation of CME/CPD activities in order to prevent possible bias (towards their products or devices), and when they are

allowed, they must be expressly declared at the start of the activity, event, etc.. CME/CPD events and other formats are reviewed in detail for the balanced and evidence-based nature of their content. Any CME/CPD not meeting these criteria will not be approved or accredited. Hence, knowledge producers, linkage agents and knowledge users have no choice but to comply with these ethical requirements.

2.8.4. Legal environment

The regulatory environment plays a large role in the knowledge transfer process in CME/CPD. Rules, laws, codes, guidelines and other policies exist at many levels and must be taken into consideration by all of the stakeholders involved. Indeed, the CME/CPD knowledge transfer/translation process occurs under the specific laws of a country or region regarding medical practice.

These legal issues affect physicians in a very particular way. For one, licensing requirements are part of the overall legal structure. Doctors are given licenses to practice under very strict conditions, and after having completed several years of schooling and passing rigorous examinations. Once in practice, doctors must follow the guidelines of medical authorities in providing good medical care to their patients. They must also respect the rules and regulations of the medical societies to which they belong. This includes the amount of CME/CPD they must accomplish per given review period. They receive severe sanctions for non-compliance or non-participation (revocation of their membership, removal of their license to practice, etc.).

Knowledge providers such as researchers and pharmaceutical companies must also follow rigorous laws in executing and disseminating their research. For instance, the clinical trial process of developing a molecule into a pharmaceutical product can take years to complete because of the various stages and reporting criteria necessary for this process.

2.8.5. Economic environment

Overall healthcare funding issues affect the CME/CPD knowledge transfer process in several different ways. For instance, the latest financial crisis has prompted austerity measures and budget cuts directly affecting healthcare spending and staffing levels in many countries. With tighter budgets, physician workloads are increased and work study leave for CME/CPD activities are decreased.

Government or other private or public funding incentivising physicians to participate in CME/CPD plays an important role in maintaining CME/CPD participation. Likewise, financial disincentives (such as physicians having to fund their own continuing education) might limit their participation in certain CME/CPD formats. We have already touched upon the ethical issues of pharmaceutical and other commercial entity funding of CME/CPD activities. Such financial grants may be helpful in promoting CME/CPD, but are controversial in maintaining impartiality and balance in CME/CPD content.

2.8.6. Technological environment

While technology was not such an important factor in the early days of CME and knowledge transfer/translation, it has now come to the forefront of issues to consider. Rapid changes and developments in various types of technology have made its use much more feasible, affordable and widespread. Technological tools for communication such as the Internet, videoconferencing, and live broadcasts and chats have enabled physicians in remote areas to participate in a variety of CME/CPD formats that were not previously available to them. These and other formats (i.e. e-learning, CD-ROMs, audio/visual tools, and emerging Web 2.0 tools such as podcasts) have been embraced by CME/CPD providers, as can be seen in the plethora of options and types of CME/CPD available to physicians today. Accrediting bodies have also started to recognize and approve online and other technologically-structured content, making CME/CPD accessible anytime and anywhere (i.e. mobile learning experiences). Furthermore, other technological advances, such as electronic audience participation systems, and virtual reality simulation tools have made pre-existing CME/CPD

activities, such as courses, lectures, conferences and symposia, more interactive, hands-on and relevant. All in all, technology has increased the potential for knowledge sharing and collaboration within society.

Therefore, the amount of use of technology for CME/CPD within a certain country has a direct impact on possible knowledge transfer/translation processes. The more these technological tools are used by providers and supported (i.e. accredited) by regulatory authorities, the more they have a chance of being used. However, this is not enough to guarantee the likelihood of use of technology-based CME/CPD. Physicians and other stakeholders (knowledge producers and linkage agents) require the skills and abilities to access and use these technological tools. This relates back to the local context and the resources (training, time, and financial) directly available to each stakeholder.

2.9. Summary of the Conceptual Framework

We have now described all of the aspects of the conceptual framework illustrated at the beginning of this chapter. As can be seen, several different factors come into play in the CME/CPD knowledge transfer/translation process. Specific contextual information relating to this framework and pertaining to each of the countries under review in this study will be discussed in Chapter 4. The next chapter highlights the research design and methodology for this study.

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

3.1. Overview

As a thesis submitted in partial fulfilment of the requirements for a Master's of Business Administration degree, this study is a descriptive, comparative analysis based on the qualitative thematic content analysis of a series of interviews with CME/CPD experts in three different countries: Canada, the United States, and England. The goal of this research, as stated in the research question, was to determine *how contextual elements influence the CME/CPD knowledge transfer/translation process and stakeholders, and how these influences compare in Canada, the United States and England.*

3.2. Design

A qualitative approach was chosen for this study because of its usefulness in providing "rich, thick descriptions" (Merriam, 1998, p. 151; Geertz 1973) of complex issues, including processes, stakeholders and contextual elements. As Mays & Pope (1995) state:

> "The goal of qualitative research is the development of concepts which help us to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to the meanings, experiences, and views of all the participants" (p. 43).

Amidst the many possible qualitative research techniques, we chose individual semi-structured in-depth interviews. This method provided the greatest possibility for detail and depth in participant responses on a variety of complex elements related to the CME/CPD knowledge transfer/translation process. In-depth group interviews and focus groups were also originally considered, but eventually discarded due to logistical, time and financial

constraints[32], as well as the lack of depth and anonymity for group sessions. DiCicco-Bloom & Crabtree (2006) summarize our concerns with group methods as compared to the chosen individual interview:

> "The individual in-depth interview allows the interviewer to delve deeply into social and personal matters, whereas the group interview allows interviewers to get a wider range of experience but, because of the public nature of the process, prevents delving as deeply into the individual" (p. 315).

The individual, in-depth interview technique chosen also matched the researcher's pre-existing interviewing skills, gained within journalism studies and professional journalism experience.

The semi-structured interviews were conducted using an interview guide with a list of the main, open-ended questions and topics we wished to cover (see the Interview Guide in Appendix B). Probing questions and follow-ups were created directly during interviews. This process is described in Rubin & Rubin (2005):

> "Researchers listen to each answer and determine the next question based on what was said. Interviewers do not work out three or four questions in advance and ask them regardless of the answers given. The interview... is invented new each time it occurs... Main questions get a conversation going on a specific matter and ensure that the overall subject is covered, whereas probes are standardized ways to ask for more depth and detail and encourage the conversational partner to continue. To achieve richness and depth of understanding, those engaged in qualitative interviews listen for and then explore key words, ideas, and themes using follow-up questions to encourage the interviewee to expand on what he or she has said that the researcher feels is important to the research" (p. 12-13).

Below is a description of the sampling, interviewing and content analysis methodology involved in this study.

---

[32] Bringing together CME/CPD experts from various places across one country would have been too difficult, let alone trying to combine groups from various countries.

3.3. Sampling

Both purposive sampling and snowball sampling were used to approach participants for this study. Purposive sampling involves selecting participants for study based on their expertise and first-hand knowledge of the study phenomenon (Lincoln & Guba, 1985). Inclusion criteria for this study's participant purposive sampling included current employment in the CME/CPD field, within the four main categories of stakeholders in the knowledge transfer/translation process (described in the Conceptual Framework derived from our Literature Review[33]): that of knowledge provider, linkage agent, knowledge user or accrediting body, in each country. Participants who had published research in peer-reviewed journals were prioritized, given their greater depth of research knowledge for the sector and their familiarity with academic research protocols. Participants also had to be willing to be interviewed (in person or over the phone) and audio-recorded during the interview. Initially, 3-5 participants were identified per country. These individuals were approached via email (see Appendix B for an example of the invitation email sent to participants). Eligibility was verified either through internet searches for professional biographies and publications or by asking participants to provide a copy of their biography/CV.

Once interviews began, snowball sampling was utilized to further identify appropriate subject matter experts for inclusion in the study. Snowball sampling is also known as "respondent-driven" or "chain referral" sampling and refers to the identification of "cases of interest from people who know people who know people who know what cases are information-rich, that is, good examples for study, good interview subjects" (Patton, 1985, p. 182). As such, initial study participants were asked if they could recommend additional eligible stakeholders in the field. Once these individuals were identified, eligibility was once again verified and these newly identified individuals were solicited with the same recruitment email inviting them to participate in the study.

---

[33] See Chapter 2 for the Conceptual Framework diagram and explanations.

It total, out of the 19 individuals who were approached for this study, 16 agreed to participate and were interviewed. (Two of the 16 interviews were not retained for the content analysis, for reasons described below.) In the end, these amounted to five interviews per country in Canada and the United States and four interviews in England.

3.4. Interviews

Open-ended, semi-structured in-depth interviews were conducted individually with each of the participants. Interviews lasted around 45 minutes in length, ranging from 30-minute to one hour long interviews. Interviews were conducted in person, over the phone or over *Skype* (due to funding and timing constraints), within three time periods, as follows:

England: Six interviews conducted between September and November 2010, four in person; one over the phone, one over Skype;

Canada: Five interviews conducted in November 2010, three in person; one over the phone, one over Skype, and;

United States: Five interviews conducted between January and March 2011; all five conducted over Skype.

In-person interviews were recorded using a digital voice recorder. One of the in-person interviews conducted in England took place in a restaurant setting. Unfortunately, ambient noise from other individuals in the restaurant and from clinking glassware and cutlery made most of the interview recording inaudible. This was only ascertained after the interview was finalized and ready to be transcribed. For this reason, the interview could not be transcribed and was not included in the final content analysis. (However, the researcher learned from this error for subsequent interviews and avoided restaurants and other public places.)

Calls over the phone were recorded using the recording function of a cellular phone. All of the phone calls were satisfactorily recording. Calls over *Skype* were recorded using free

internet software called *VodBurner.* This software also worked very well for recording and playback purposes.

Participants were asked via email for their consent to be recorded for the purposes of this research. Each participant consented, either through email or verbally before the start of their interview.

The first interviewee was contacted on a recommendation from the study director and the in-person semi-structured interview that followed provided a broad overview of the medical field and an historical perspective of the British healthcare system. This interview was not retained for the content analysis because the participant failed to meet the eligibility criteria (she did not work in the CME/CPD sector). However, this interview gave the researcher practice in research-based interviewing techniques and helped define and refine interview questions and interview guide used in subsequent interviews.

All of the interviews were conducted in English, with the exception of one live, face-to-face interview which was conducted in French. Pertinent quotes identified through our content analysis were translated for use in this study.

3.4.1. Interview guide

An interview guide (See Appendix B) was created based on the recommendations of Lindlof and Taylor (2002), who describe the usefulness of an "informal grouping of topics and questions that the interviewer can ask in different ways for different participants." Although the guide contained a list of open-ended questions, not all of these questions were used for each interview, and some were reformulated during the interviews. Additional questions were added as and when pertinent, at the researcher's discretion. This follows DiCicco-Bloom & Crabtree (2006)'s description of the qualitative research interview:

> "The iterative nature of the qualitative research process in which preliminary data analysis coincides with data collection often results in altering questions as the investigators learn more about the subject. Questions that are not

> effective at eliciting the necessary information can be dropped and new ones added. Furthermore, the interviewer should be prepared to depart from the planned itinerary during the interview because digressions can be very productive as they follow the interviewee's interest and knowledge" (p. 316).

3.5. Content Analysis

We used qualitative, thematic (manual) content analysis to analyse the 14 participant interviews. Qualitative content analysis is defined as:

> "A research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005).

As Elo & Kyngäs (2008) note, content analysis is useful in "developing an understanding of the meaning of communication... and to identify critical processes... It is concerned with meanings, intentions, consequences and context" (p. 108-9).

Several content analysis techniques exist depending on the availability of prior theories and research. Hsieh & Shannon (2005) describe directed content analysis as the type of content analysis to choose when "theory or prior research exists about a phenomenon that is incomplete or would benefit from further description" (p. 1281). We chose this approach because prior theories and research do already exist on both the knowledge transfer/translation process and other aspects of adult learning, as highlighted in our literature review in Chapter 1. Furthermore, the goal of this study, as described in our research question, is to determine *how contextual elements influence the CME/CPD knowledge transfer/translation process and stakeholders, and how these influences compare in Canada, the United States and England.* In other words, we wish to describe the process in greater detail.

As Hsieh & Shannon (2005) state, the goal of a directed approach to content analysis is

> "To validate or extend conceptually a theoretical framework or theory. Existing theory or research can help focus the research question. It can provide predictions about the variables of interest or about the relationships among variables, thus helping to determine the initial coding scheme or relationships between codes" (p. 1281).

Beyond Hsieh & Shannon (2005) and Elo & Kyngäs (2008), the works of Rubin & Rubin (2005), and Merriam (1998), guided our methods for coding, theme development and analysis. Elo & Kyngäs (2008) describe the three phases of content analysis: preparation, organization and reporting (p. 109-10). We will discuss these three phases next, as per the approach used in our study.

3.5.1. Preparation

Prior to the content analysis process, each interview was transcribed, verbatim, by the researcher. Most interviews produced 15-20 page long transcripts in *Word* document format. Each transcript was read and compared to the original recording to check for accuracy, spelling and other errors until the researcher deemed they were ready to be analysed.

3.5.2. Organization

Initial manual coding was based on the main categories highlighted in the Conceptual Framework of this study, stemming from the various theories we discussed in our review of the literature. This is aligned with the strategy suggested by Hsieh & Shannon (2005), as described above, where existing theories and frameworks can help determine variables of interest. In our case, these included: knowledge producers (k_prod), linkage agents (link),

knowledge users (k_user), political environment (pol), and economic environment (econ), etc.[34]. These codes were used during a first reading of each of the interview transcripts.

Our next step was manual open coding, a process where "notes and headings are written in the text while reading it," as defined by Elo & Kyngäs (2008). Any initial codes that received no mention were discarded. Any additional themes were highlighted in the transcripts, compiled and arranged into new categories after each of the transcripts had been re-read on several occasions.

Categories were manually revised and merged until the researcher felt no new themes or categories were emerging from the reading of the transcripts. A final list of categories and codes was manually produced, using definitions and quotes to describe each section. This final list was used to code each of the interview transcripts.

3.5.3. Reporting

The compilation of coded quotes was used for the reporting and analysis of our results. Quotes were assembled by theme using manual readings and searches in each of the coded transcripts. Further precision and searches were enabled with the use of the *Find* function in Microsoft Word.

Chapter 5 presents our research results and summarizes the major themes identified by participants. These are discussed in relationship to our research question, along with the main questions identified in our Interview Guide. Chapter 6 provides our analysis and discussion of these results. In conjunction with our Conceptual Framework and Description of the Research Context in each country, we highlight our major findings and discuss possible explanations.

3.6. Validity & Reliability

[34] Refer to Appendix B for the complete list of initial categories and codes.

Ensuring rigor has long been an area of focus in qualitative research (Mays & Pope, 1995), and this was definitely taken into account for this study. In order to ensure validity, we followed Mays & Pope's guidelines about ways to ensure and retest reliability. The authors outline the following ways:

1. Maintaining meticulous records of interviews and observations and by documenting the process of analysis in detail
2. Analysing data by classifying and categorising it (in a group, if possible)
3. Developing a coding frame to characterize each utterance
4. Coding (by more than one researcher)
5. Organising an independent assessment of transcripts by other researchers
6. Comparing agreement between the raters

While we were limited in terms of lacking the presence of other researchers to validate/corroborate the data, we did manage to maintain meticulous records of the interviews (by audio-recording them), we analysed and coded the data in multiple stages (initial coding, open coding, revising of categories, as described above). The researcher sanity-checked all of these codes and categories at multiple times during the research (i.e. during transcription, after verification of the transcripts, during the coding, and months later during the analysis phase of the study) and process helped to create some distance and objectivity in the final analysis. Parts of the research were also read (and approved) by M. Ebrahimi, the research director, who provided objective feedback and suggested changes as and when necessary.

In terms of safeguarding the validity of the data, the number and type of people we interviewed helped us to "triangulate" the data we collected by confirming it from a number of different sources (5 in each country, each involved in different aspects of CME/CPD). Mays & Pope (1995) define triangulation as:

> "An approach to data collection in which evidence is deliberately sought from a wide range of different, independent sources and often by different means (for instance, comparing oral testimony with written records)" (p.110).

By interviewing a number of people in different occupations and different countries, we were able to identify patterns of convergence and trends that were discussed by most of the sources we interviewed (see Chapter 5, which presents our research results).

3.7. Summary

In short, this chapter presented our research design and methodology. It highlighted our qualitative approach via our semi-structured, in-depth interviews and qualitative, thematic content analysis. We discussed our choice of purposive and snowball sampling techniques and our process for identifying, inviting and selecting research participants. We then explained our interview process, presented our interview guide and explained the recording mechanisms used. Finally, we concluded by highlighting the steps involved in our content analysis – from preparation and transcription to creating and revising codes and thematic categories and eventually coding and compiling our findings. The next chapter will set the tone for the rest of this study, describing the particular Research Contexts in Canada, the United States and England, in relation to the elements identified in the Conceptual Framework.

CHAPTER 4
DESCRIPTION OF THE RESEARCH CONTEXT

In this section, we will highlight the overall healthcare system of each country under study: Canada, the United States, and England. We will finish by presenting the individuals who were interviewed for this study, leading directly to Chapter 5, a presentation of the research results.

4.1. Overview of the healthcare system

4.1.1. Canada

The Canadian healthcare system is primarily publicly funded (mostly through federal and provincial/territorial tax dollars) and aims to provide universal coverage and medically necessary hospital care and physician services that are free, at point of use, for all legal residents (Health Canada, 2010). Instead of a single national plan, the Canadian healthcare program is composed of 13 interlocking provincial and territorial health insurance plans, conjointly known as "Medicare." Each provincial or territorial government is responsible for the management, organization and delivery of health services for their residents.

In the past, CME / CPD in Canada was largely voluntary and considered a self-directed activity (Sriharan, 2009). However, physicians having memberships and certifications with either of the Colleges of medicine (CFPC or RCPSC) must acquire a minimum standard of CME / CPD credits in order to maintain membership and certification within that College, and other medical associations also have specific CME / CPD requirements.

The move towards mandatory revalidation of physicians' fitness to practice (including participation in CME / CPD activities) is underway in Canada. The Federation of Medical Regulatory Authorities of Canada (FMRAC), issued a position statement on revalidation in July 2007, stating that:

> "All licensed physicians in Canada must participate in a recognized revalidation process in which they demonstrate their commitment to continued competent performance in a framework that is fair, relevant, inclusive, transferable, and formative" (FMRAC, 2007).

British Columbia introduced its revalidation process in January 2010, requiring mandatory compliance with CME / CPD requirements of either the RCPSC or the CFPC (University of British Columbia, 2011). Other provinces/territories are also taking steps towards the introduction of mandatory revalidation[35].

4.1.2. England

Similarly to the Canadian healthcare system, the United Kingdom has a single healthcare system, the National Health Service (NHS) that provides universal care to all legal residents of the nation, "based on need, not ability to pay" (Department of Health, 2011). The system is publicly funded through general taxation and each country in the United Kingdom through each national health department takes care of administering healthcare, making policy decisions and setting the health budget. In England, CME/CPD has become mandatory with the recent introduction of relicensure (Sriharan, *et al.*, 2009). It is overseen by the General Medical Council since 2002 (Starke, 2006) and governed by the standards of "Good Medical Practice" issued in 1998 by the GMC. These standards of Good Medical Practice include seven categories: Good clinical care, Maintaining good medical practice, Relationships with patients, Working with colleagues, Teaching/training, appraisal/assessment, Probity and Health (Starke, 2006). Participation in CME/CPD falls under the second standard and includes keeping up to date and maintaining and improving performance (GMC, 2011).

---

[35] For instance, the College of Physicians and Surgeons of Newfoundland and Labrador (CPSNL) under its *Medical Act 2011* will introduce Quality Assurance and revalidation as of December 31st, 2011 (CPSNL, 2010).

4.1.3. United States

Healthcare in the United States is very different from that described in Canada and England. Indeed, the US healthcare system is primarily funded through the private sector. It is dominated by private insurance companies instead of public insurers, as is the case in Canada and England. Public insurance does exist in the form of Medicare, Medicaid and other government-funded programs that cover the elderly, military, veterans, disabled or low-income individuals.

In the United States, CME/CPD is mandatory in many states that require CME for the maintenance of licensure. CME is regulated by the Accreditation Council for Continuing Medical Education (ACCME). The ACCME is composed of seven member organizations: the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, the Association for Hospital Medical Education, the Council of Medical Specialty Societies, and the Federation of State Medical Boards. The primary responsibilities of the ACCME are to accredit institutions and organizations offering CME, define criteria for evaluation of educational programs and ensure compliance with these standards, and develop methods for measuring the effectiveness of CME and its accreditation (American Accreditation Council for Continuing Medical Education, 2011).

4.2. Interviewees

The following individuals were interviewed for the purposes of this study. These individuals were chosen for their expert knowledge of their country's CME / CPD landscape and of the roles of the regulatory and accreditation bodies, as well as other stakeholders in the CME / CPD knowledge transfer / translation process. As described in our discussion of sampling in Chapter 3 (Research design and methodology), inclusion criteria for participation in this

study included current employment in the CME/CPD field, within the four main categories of stakeholders in the knowledge transfer/translation process (described in the Conceptual Framework derived from our Literature Review[36]): that of knowledge provider, linkage agent, knowledge user or accrediting body, in each country. Participants who had published research in peer-reviewed journals were prioritized, given their greater depth of research knowledge for the sector and their familiarity with academic research protocols. Participants also had to be willing to be interviewed (in person or over the phone) and audio-recorded during the interview. In the end, the following individuals were selected for their views on the CME/CPD system:

4.2.1. Canada

1. **Dr. Bernard Marlow**, Director of Continuing Professional Development, College of Family Physicians of Canada
2. **Dr. Craig Campbell**, Director, Professional Affairs, Royal College of Physicians and Surgeons of Canada
3. **Dr. Paul C. Hébert**, Editor-in-Chief, Canadian Medical Association Journal
4. **Dr. François Goulet,** Associate Director, Collège des Médecins du Québec
5. **Dr. Jocelyn Lockyer,** Associate Dean Continuing Medical Education (CME) and Professional Development & Professor, Department of Community Health Sciences, University of Calgary

4.2.2. England

1. **Dr. Jackie Hanson**, co-author on the report on Effectiveness of CPD
2. **James Hill-Wheatley**, Education and CPD Manager, Royal College of Physicians
3. **Christiane Rehwagen**, British Medical Journal Masterclasses Editor
4. **Dr. Mike Davis**, Freelance CME Consultant

[36] See Chapter 2 for the Conceptual Framework diagram and explanations.

4.2.3. United States

1. **Dr. Murray Kopelow**, Chief Executive of the American Accreditation Council for Continuing Medical Education
2. **Dr. David Davis,** Senior Director for Continuing Education and Performance Improvement at the Association of American Medical Colleges
3. **Carly Harrington**, Manager, CME Accreditation, American Academy of Family Physicians
4. **Dr. Baretta Casey,** Professor, University of Kentucky College of Public Health
5. **Dr. Todd Dorman,** Associate Dean & Director, Continuing Medical Education Professor, Johns Hopkins University School of Medicine

CHAPTER 5
PRESENTATION OF RESULTS

The previous sections have set the stage for the final portions of this study. After our introduction, Chapter 1 showcased our review of the literature on knowledge transfer/translation and CME/CPD. Chapter 2 presented our conceptual framework, based on theories and research from the literature review. Chapter 3 introduced the methodology used in this study, presenting a description of the sampling, data collection (interview) and content analysis processes. Finally, Chapter 4 made use of our conceptual framework to describe our research context: the CME/CPD knowledge transfer/translation process in Canada, the United States, and England.

This chapter now presents the results of the thematic, directed content analysis of the 14 in-depth semi-structured interviews conducted for this research. The content analysis revealed several emergent themes, which will be discussed in five separate sections. These sections are the amalgamation of the various categories and codes found throughout the content analysis. (For an overview of the initial codes and categories, as well as the revised, final codes, see Appendix B.)

The themes to be discussed in this section are: CME/CPD as a field and profession; the "business" of CME/CPD; the new focus of CME/CPD; the new formats used in CME/CPD; and the impact of contextual elements on the CME/CPD process. Each part will be summarized and described using quotes directly from the transcripts of each of the participants who were interviewed. These results will be analyzed in detail in the next chapter, along with our discussion of specific elements of the research context, as described in Chapter 4.

5.1. CME / CPD as a field and profession

One of the major themes that surfaced in most of the interviews was the fact that in the last 10-20 years, continuing medical education / continuing professional development has emerged its own distinct discipline – as a complex system including multiple stakeholders, a field of research and study, and a profession. Participants in each country expressed their portrayals of the profound changes that have taken place within CME/CPD in recent years, and these have in turn had a direct effect on the way doctors receive their CME/CPD and the way knowledge is transferred and translated in the field.

This was epitomized in a quote by Dr. Todd Dorman, President of the Society for Academic CME and Associate Dean and Director of the Office of Continuing Medical Education at John Hopkins University, who said (rather jokingly), "Today's CME is not your daddy's CME."

Dr. Dorman clarified by explaining his vision of CME today in comparison to that of the past:

> "I think CME... CME is barely recognizable today versus ten years ago... And... recognizable compared to five, but at the same time, become unrecognizable compared to even five years ago. And this is a really key and critical component because... a discussion of CME... because what we continue to see is a litany of... materials that are published in CME that are quoting articles from the... 70s, 80s and early 90s... From a system of CME that doesn't exist today. And that information is essentially – at least potentially – worthless until redone and proven to actually be a marker of today's system" (Dr. Todd Dorman, United States).

"Today's system" was described in detail by Dr. Craig Campbell, Director of Professional Affairs at Royal College of Physicians and Surgeons of Canada:

> "[You] know, we're not just focusing on a small, narrow field anymore. This has become quite a diverse system. And the neat thing about the last, I'd say, 20 years is that CME has now become a discipline... And it has a scholarship. And it has a theoretical base. And it's come from... out of the dark ages of the

> educational spheres... to something that's now deemed to be a legitimate profession" (Dr. Craig Campbell, Canada).

Fellow Canadian, Bernard Marlow, Director of Continuing Professional Development at the College of Family Physicians of Canada, agreed that previously a "science" was not associated to the field:

> "[It's] been an explosion only in the last 10 years. Because prior to that, there was no science around most of what we did" (Dr. Bernard Marlow, Canada).

Indeed, prior to this period, according to interviewees, research and study related to CME/CPD emanated from a combination of fields, ranging from education, healthcare, organizational science, and sociology, amongst others. Nowadays, although this transdisciplinary nature still continues, science and literature pertaining specifically to the topic of CME/CPD exist, as typified by research in the *Journal of Continuing Education in the Health Professions* (mentioned by Dr. Dave Davis (United States) in his interview).

The professionalization of the field was another major change mentioned by many of the participants. In fact, as described by several interviewees, those who were involved in CME/CPD 15-20 years ago, came to a career and a field that were not yet defined:

> "I think you'll find that everyone in continuing medical education got into it by accident – most people!" (Dr. Murray Kopelow, United States).

The "accidental" nature of a career in CME/CPD was also identified by Dr. Marlow (Canada):

> M: And how did you get involved exactly when you first started in 1979?
>
> B: They were looking for volunteers.
>
> M: Oh, OK!
>
> B: And either I was away or I put my hand up, I can't remember how I became involved. (Dr. Bernard Marlow, Canada)

Mike Davis (England) had a similar inadvertent start in the field, answering the question as follows:

> "(Laughs) Well, working in university... I'm sure you've been in that situation where you amble down a corridor and you bump into a colleague... that was exactly my introduction to [CME]" (Mike Davis, England).

Dr. Dorman could not say that his CME career was "accidental" *per se*, but he did admit to an element of chance in his career progression:

> T: I got involved in CME... I guess... depends what you mean by involved... But my initial involvement was to... attend, subsequently to be a speaker, so on the faculty for CME events, eventually to being the course co-director of an activity and then eventually the director of a CME activity. Through that mechanism eventually got asked to serve on the CME Office's advisory board and subsequently to chair that advisory board. And then subsequently to that, got asked to... uhhh... replace the previous Dean of CME at Hopkins.
>
> M: OK. So you're involvement was kind of a gradual, stepping stone... one position lead to the other if we could say... But I imagine you would have had to have an interest in CME to begin with to... to get into the field... in the beginning. Or was it kind of just... accidental?...
>
> T: It wasn't like I went from a nobody to this...
>
> M: (Laughs)
>
> T: But the sequence [of involvement in CME] – some planned, some obvious, some logical, some... serendipity. (Dr. Todd Dorman, United States)

In short, nowadays, CME/CPD has become a field within which one can have a legitimate professional career:

> MK: A third change is in... there's been a bi-modal change in the people in continuing education. For many years, it was... it was those meeting planners.
>
> M: Mmmhmm
>
> MK: And, um, now what there is is there's those meeting planners and groups of people who have been at it a long time, who are doing it in an evidence-based fashion, who... see it as a profession and as their career. (Dr. Murray Kopelow, United States).

However, this remains a relatively unknown career path in a relatively unknown field, as suggested by Carly Harrington, Manager of CME Accreditation at the American Academy of Family Physicians:

> "And we'll often joke that... Well I'll often tell people that, "Oh ever since I was a little girl, I wanted to be in CME." Because that's... there's really no... I don't know anyone... It's not really a field people know about and tell you... and have some interaction with it in their life." (Carly Harrington, US)

But for those in the know, including those in the fields of healthcare and continuing education and professional development (whether medical or not), CME is now holding its own as a field. As Dr. Todd Dorman (US) explained, the CME "system" has gone through a period of change and development akin to what medical education and graduate medical education programs went through in the past. Although CME is still not as standardized and developed as these two formal education systems, Dr. Dorman stated that it is well on its way:

> "You had questions coming about whether CME was effective and whether it should be ditched. But to be fair, you had similar questions occur over the last 15 to 20 years about medical ed and graduate medical ed... So, you know, you had a revolution in medical ed about 15 years ago, another one's occurring today, but about 15 years ago, and then graduate medical ed." (Dr. Todd Dorman, United States).

In short, according to our participants, CME is going through phases of development that medical education programs (undergraduate and graduate) went through previously. Despite these changes, the lifelong learning system is not on par with the other, formal medical education programs:

> M: Would you consider CME now to be a system that is developed like undergraduate and graduate education is? Is it.. Has it become its own... I don't know how to call it... besides a system...?
>
> T: So I would... um I would say that it is a system. I would say that it is not akin to ME and GME though, and I think that's one of the potential weaknesses of

> the present system. So, you know, ME [medical education] and GME [graduate medical education] are tightly regulated and controlled including the fact that they are basically occurring at academic medical centers and/or affiliates of academic medical centers. And I'm not suggesting that you don't send students or residents out into the community, into part-time faculty and other locations where they can get educated into things that the more classic academic pillars may not have as repletely available on campus. But it's still driven, regulated and managed essentially centrally. CME is a much more distributed process and CME accredited certified CME can be provided by medical schools, it can be provided by teaching hospitals, it can be provided by professional societies, and it can be provided by medical education companies.
>
> M: Right.
>
> T: So, in ME, GME, you have the equivalent of sort of a college setting. What I mean by that is you take courses, classes and rotations and those credits add up to be a degree. In CME, you take activities to get credits and those credits add up for your ability to get credentialed or licensed, but... you can... you're receiving credits from potentially a non-edu--- a non-classic education source, right. Not a university, or a teaching hospital. You could be receiving that education from a medical education company.
>
> M: OK
>
> T: So I think in that way, it's not as regulated as a system. There's 130 ballpark teaching hospitals in... I'm sorry... 130 academic medical centers that's a ballpark number – it might be 135 now. But around that number in the United States. There are 2300 accredited CME providers. (Dr. Todd Dorman, United States)

According to Dr. Dorman (US), a primary component of defining the "field" of CME/CPD is to have a clear, overarching taxonomy, where concepts and processes are understood by all of those involved – doctors, CME/CPD providers, accreditation bodies, etc., so that the research and literature on the field can be appropriately conducted, recognized and utilized. For Dr. Dorman, this type of taxonomy does not yet exist for CME/CPD:

> T: My last comment on this topic is... there's not a standardized taxonomy in the field.
>
> M: Yeah

> T: And so without a standardized taxonomy, when we did our large ARC Grant for doing basically an evidence-based literature review on the effectiveness of CME, a major barrier was this issue of taxonomy. And this will not be easy. Because CME brings together professional development fields, sociology fields, classic education fields, some healthcare issues and a couple of other formats of education and/or fields of knowledge... umm... adult learning, on and on and on.
>
> M: Yeah
>
> T: And so it's not going to be easy to come up with a taxonomy that's going to work across all of those domains. But we need a taxonomy so that we can really understand the signal to noise ratio in these studies that get done... by being able to combine them into systematic reviews and meta-analyses over time. (Dr. Todd Dorman, United States).

We observed this lack of a clear taxonomy in our interviews with participants. For instance, two respondents gave varying definitions of the concepts of "CME" and "CPD." Dr. Bernard Marlow (Canada) emphasized the "holistic" and longitudinal nature of CPD as compared to CME:

> M: Ok. And in terms of the terminology itself – of CME, CDP...?
>
> B: So CME was a one-off event if you like – a live event very often.
>
> M: Mmmhmm
>
> B: Continuing professional development is more longitudinal. It's a process of identifying one's learning needs. And the content has changed from medical knowledge to all of the other many roles that physicians play, such as collaborator or communicator.
>
> M: Mmmhmm
>
> B: So a much broader range of activities and topics. (Dr. Bernard Marlow, Canada).

On the other hand, Dr. Murray Kopelow (United States) disagreed with the "holistic," more inclusive view of CPD, stating instead that CME is, in essence, a subset of CPD:

> MK: Well first of all... Let's be clear about my definition of the difference between CPD and CME.
>
> M: Yes, definitely.
>
> MK: Some people use, and I think wrongly, CPD to talk about some sort of "holistic", more expansive, more better continuing medical education. And mine is entirely different. Mine is that continuing professional development is something that the physicians do. That as a professional, I'm constantly involved with figuring out what I need to know and what I need to do better and knowing more and doing better. That's what I do – that's my job.
>
> M: Yep
>
> MK: Continuing medical education is one of the sets of resources that I can use for my CPD. It's a form – They are the educational resources to drive my CPD. And... but I can just talk to my colleagues. I can just read a book. I can just... make up a new strategy, I can... observe the world, I can read the literature. All of these things come together to support my continuing professional development. And like I said, continuing medical education is one of those sets of resources and we manage and set standards for those resources and how they should be available. (Murray Kopelow, United States).

In summary, participants classified CME/CPD as a distinct field of work and scholarship – a shift that has occurred only in the last couple of decades. Despite this professionalization and legitimization of the field, the CME/CPD system still remains under development, not yet reaching the standardization and formalization of other medical (undergraduate and graduate) types of education. According to interviewees, establishing a clear taxonomy is one barrier to overcome in this development process.

The more CME/CPD become "legitimized" as a profession and field of study, the better the processes, structures, rules and regulations will be. In turn, this will result in a better knowledge transfer and translation process for doctors involved in assimilating knowledge into practice. The content of CME/CPD and modalities for transfer (and eventually translating) this knowledge will be better aligned with the needs of physician practitioners and the greater public.

5.2. The "business" of CME/CPD

Beyond simply being a field of study and work, participants referred to CME/CPD as the "CME Enterprise[37]." As such, notions likening CME/CPD to a business were identified, including profits, costs, budgeting, and marketing to physician "customers." These citations normally tied directly into discussions of funding and of examples of particular economic and regulatory contextual elements regarding sources of funding. Such specific contextual aspects will be discussed in the last part of this Chapter. For now, we will focus on the business-related vocabulary and descriptions that emerged from the perspectives of interviewees on CME/CPD.

Firstly, several participants highlighted the expenses involved in producing high-quality CME/CPD. Dr. Jackie Hanson, consultant in Emergency Medicine at Lancashire Teaching Hospital Trust and past Director of Continuing Professional Development for the College of Emergency Medicine (England) described the cost considerations in CME/CPD:

> "It's expensive business and we need to know what's going on and what works and what doesn't."(Dr. Jackie Hanson, England)

Dr. Dave Davis (United States) emphasized the notion of "return on investment" necessary for CME/CPD endeavors. He said:

> "We don't think about doing something without also thinking about the outcome[38]." (Dr. Dave Davis, United States).

Dr. Jocelyn Lockyer (Canada) also echoed this discussion on returns on investment, saying that certain individualized CME/CPD projects (such as simulation or skills-based programs) sometimes had to be put aside because of cost issues:

---

[37] Specifically, these mentions of the term "CME Enterprise" were by two American interviewees, Dr. Todd Dorman, and Carly Harrington.

[38] Here, Dr. Davis was not only referring to financial outcomes and returns on investment, but to the "value" of CME/CPD activities "to patient care, to the practitioner, to population health." This societal notion of "outcomes" is discussed in the next section, Part C.

> "[It's] within the limits of the budget, right. We can gain... I mean if we can't market it at that price, then no we don't. I mean we do have to break even." (Dr. Jocelyn Lockyer, Canada).

Dr. Lockyer also mentioned the important role of marketing in CME/CPD, to ensure that enough people participate in activities.

All of these participant perspectives highlight the need for funding within the CME/CPD system – whether government funding, commercial support, or self-funding from physician participants. In fact, innovation in CME/CPD largely depends on cost issues and funding, as was brought up by Carly Harrington:

> "[In] terms of educational delivery too... Utilizing the internet... Utilizing apps and um webinars and automating and putting more of our materials online... there's definitely a lot of ideas. It's just a matter of implementation. And funding (laughs)."

Lastly, in this "business" perspective of CME/CPD, physicians are seen as more than learners. They are also "customers," as highlighted in this quote by Christine Rehwagen, Editor of the *British Medical Journal* Masterclasses:

> "I mean, we kind of have quite a few different offerings for CPD, the online one which I am still partly involved in and we also, I mean, work together with the editors of the online and really try to give the... our customers... lots of them are BMA members, but we also have lots of others and international doctors... a really nice blended learning experience."

In short, interviewees described CME/CPD as more than just a field of study or a career. They also brought up the business side of things, where meeting financial objectives and staying within the constraints of a budget are necessary. For participants, this highlighted the complexity of the expected roles CME/CPD providers – making financial contributions to meet business goals versus educational and societal contributions to meet physician lifelong

learning objectives and overall population health. These economic and ethical contextual dimensions were often referred to in discussions about the "business of CME," as will be described in the last part of this chapter.

5.3. The new focus of CME/CPD

Throughout most of the interviews, participants highlighted a trend in modern-day CME/CPD: the shift away from medical, scientific content delivered in one-off, didactic, lecture-based formats to an overall focus on quality, needs, and relevance – all in a variety of formats. In this section, we will discuss what participants said about the change in focus of CME/CPD activities. In Section D, we will present their descriptions of the multifaceted and multifarious types of CME/CPD that are now available.

Dr. Bernard Marlow (Canada) described the evolution of CME early in his career to what he was observing today:

> "Well let's start with the CME when I started practice and that was usually hospital clinic days once a year with a wide variety of programs that were selected by a group of specialists and who determined what to deliver to their audience of family doctors. And at one point in time, these rounds attracted 500 to 1000 people in downtown Toronto. And... it was more of an update of what was new over the year... And so it was episodic, not necessarily needs-based. The planning committee did not have representatives of the target audience, and it was primarily lecture format and so... we've evolved from that point in time to involving family doctors in the planning of their own education, which is a basic adult learning principle. We have gone beyond lectures into small group learning, into self-assessment and individual learning projects and awarding credits for them. And we have increased the level of evaluation of our programs to look at effectiveness beyond the happiness index and look more into intent to change or commitment to change. And in some cases measure changes in knowledge and behavior." (Bernard Marlow, Canada).

Carly Harrington (United States) also highlighted the importance of creating quality CME/CPD programs and activities that go beyond passive learning:

> "And now what we're shifting towards is this... are we focused on quality outcomes and how are we ensuring them. So, definitely more of a drive towards adult education concepts, making sure that we're getting... we're presenting information that's relevant, that has meaning and that we're requiring some sort of participation on the part of the learner, not only to try to bring it to a higher level but ummm to ensure that this isn't just kind of an exercise... that they're going through where they're sitting in the back of the class and checking their email... you know... we want to make sure that they're really learning. It's important to healthcare." (Carly Harrington, United States).

Indeed, the overall focus on quality was apparent in all of the interviews. Quality was not expressly defined by each of the participants, but Dr. Baretta Casey (United States) summarized some of the main elements of "quality CME/CPD":

> M: And when you talk about quality... I know that this has been mentioned a couple of times, but what are... what are some of the elements that you look at? I know you mentioned free of bias and commercial support and you look at the evaluation, or the outline and the overall presentation, but what are some of the actual things that you look at when you want a "quality" presentation?
>
> B: Right. Well, certainly you want to assure that if the topic is being taught that the content is up-to-date, it's accurate, it's covering the... what is accepted standard of care, and... ummm... it is letting the audience know that if they talk about the future that they make sure that the audience understands that maybe it's not current, accepted standard of care, that there is research ongoing in those fields. We also want to look at, like we said, the evaluation at the end of the program. Whether they do a pre-test and post-test, or they just do a post-test. There has to be some way to assure the creditors that people are looking at what the participants have learned out of the program. (Dr. Baretta Casey, United States).

Overall, quality seemed to entail deliberateness and thoughtfulness in the content involved in an activity or program. Particularly, this content has to be timely and accurate. Furthermore, it has to be relevant to the audience at hand.

A focus on participant needs was part of the definition of "quality" and "relevant" CME/CPD, as described by Christine Rehwagen (England):

> M: OK. And you were saying you look at the quality and the way it is delivered. Do you have specific guidelines that you have to follow for the quality or the content of the...
>
> C: I mean we really try to be practical and useful and we really try to give doctors... I mean, doctors of different specialty areas, what they need at this that time in their career. (Christine Rehwagen, England)

Many interviewees spoke about the importance of assessing the needs of participants prior to creating the CME/CPD activities and programs. Formal pre-design processes known as "needs assessments" by CME/CPD providers were one form of appraisal described by interviewees. Carly Harrington (United States) highlighted the needs assessment process at the American Academy of Physicians:

> C: We do have a needs assessment process we follow here which is... This has been developed over the last few years, but we have... um... a full-time person dedicated to – she works with our medical director who is a physician – um, who has identified several areas that are important to family physicians. This person does a lot of research to... find specifics about where there's a gap between best practices and current practices. And... um, how can we design education that would satisfy that and close that gap. So, um, definitely on the front end we have a lot of thought and a lot of rigor put into ensuring that it's meaningful.

Dr. Jocelyn Lockyer (Canada) described how the needs assessment process has evolved over the years:

> M: OK. So this is a way of... kind of... building on existing data to make programs or activities or different CME opportunities. Now, are there other

> ways, other techniques that you've been involved in? In developing either needs assessments, programs, or anything like that?
>
> J: For sure. I guess I wasn't really thinking about that. But certainly in terms of developing educational programs, I would say the needs assessment work has become more sophisticated over the years.
>
> M: Mmmhmm. What are some of the changes?
>
> J: We're more systematic about it. And we're more strategic about it. Recently we developed our therapeutics course, we get information about drug prescribing across the province, we get information from pharmaceutical companies about the products, we get input from past teachers and division heads about new directions. And we really look at what we've done before so that the curriculum looks like an on-going curriculum for the doctors.
>
> M: Mmmhmm
>
> J: In other courses we're drawing on clinical practice guidelines and doing more of an environmental scan as well as systematic needs assessments of the doctors. (Jocelyn Lockyer, Canada).

These formal needs assessments are often necessary for providers to gain accreditation for the CME/CPD activities and programs. As participants described, these needs assessments must be provided along with other documentation to the accrediting body. They are used in part to gage the value and necessity of CME/CPD activities for physician participants.

Although needs assessments are often conducted formally by outside sources such as CME/CPD providers on behalf of physicians, as described above, interviewees also mentioned that physicians themselves can use self-assessment processes to discover the types of needs they have and to find appropriate CME/CPD simultaneously.

Dr. François Goulet, Associate Director at the Collège des Médecins du Québec, described the self-assessment process of needs identification as a self-reflective activity:

> "What we want is to say that the reflective approach, of reflecting on one's practice, on one's strengths, one's weaknesses, doing continuing education adapted to these needs, that is important." (Dr. Françcois Groulet, Canada)

"Scanning" was one of the self-assessment processes identified by participants. It entails "un-planned" learning, where physicians aren't necessarily aware of their needs ahead of time:

> C: But there's another form of self learning that we had... That we've always known about but probably hadn't articulated all that well. And that's what we call "scanning". So scanning or learning—self-learning activities where learners don't really have a need in mind... it's not predefined. But they are scanning their environment for new ideas, new evidence, evidence of what practices should be discontinued or what their fellows are stopping as opposed to starting. Things that are potentially relevant, it's like having an awareness of... of new information, knowledge or evidence that may... that has relevance to what they do.
>
> M: OK
>
> C: So, examples of that are reading journals, although you could read a journal because you have a question and you've actually selected it as a planned learning project, or you could just be reading the journal because you always read that journal. You might scan the topic or the abstract, or read the whole article. But the key difference between the two is that you don't have a defined need. (Dr. Craig Campbell, Canada)

Overall, the main idea with all forms of needs assessments – whether formal or informal, self-reflective or externally based – is to provide physicians with educational content that is relevant to their individual professional practice. This takes into consideration the various roles that physicians occupy, beyond their roles as caregivers. Dr. Craig Campbell (Canada) highlights this change from CME to CPD:

> "What we now have expanded to is the idea of continuing professional development, which takes in a domain of learning that is way broader than just a medical expert... So part of what's changed is that learning about how to be a better communicator, collaborator, advocate, all the ethical and professional roles and responsibilities the profession needs to continue to assume and to do well in. They are part of the learning system. It's part of what we do." (Dr. Craig Campbell, Canada)

Indeed, all of these needs-based and practice-based aspects are now important considerations for CME/CPD providers.

But, according to interviewees, the focus of modern day CME/CPD goes beyond identifying the individual needs of participants. CME/CPD is now imbued with a sense of accountability, that physicians must "gain" something out of their continuing education experience. This includes physician performance improvement and was referred to as the "impact" or "outcomes" of CME/CPD.

> "And we still need to document what was learned and what the impact was, because we've shifted now to a much more outcomes-focused approach to learning. But we're assuming that these certain activities are in fact learning experiences. So, we phrase that as systems learning. So, when you engage and work within a system, and that system could be the health system... There are people who are participating in quality care initiatives in their hospital, patient safety issues, setting standards for clinical care, whether that's a care map or a hospital standard for how certain diseases or disorders are going to be approached or managed. We assume that that's a learning experience. And so you get credit for engaging in those activities if you can define an outcome of what you learned and what the outcome was for you." (Dr. Craig Campbell, Canada).

Several interviewees, including Dr. Dave Davis (United States), described the use of post-activity "evaluation" component which attempts to identify the outcomes of CME/CPD:

> "Evaluation similarly has changed. So it's a three-step process. Planning the activity, doing the activity and then evaluating... Evaluation has moved much more from the happiness index – did you like the speaker and was the room too warm to... what practice changes are you going to be making and can you demonstrate those practice changes." (Dr. Dave Davis, United States).

This is often another requirement of accrediting bodies to CME/CPD providers. Such providers are not accredited unless they can show that they include a post-activity evaluation component, and demonstrate that their learning method is effective at meetings the educational objectives it sets out to fulfill. Mike Davis, for instance, highlighted the evaluation processes used in the projects he is involved in:

> MD: Well we have... we... in all of the programs that I am involved in, we do engage in a process of evaluation... Basically because you are obliged to as a provider. And we've worked extensively really to look for ways in which we can evaluate beyond the event itself and with the implementation, for example, of the virtual learning environment for Advanced Pediatric Life Support, we conducted course + 6 months of course + 2 years evaluations to explore the extent to which the course had an impact on people's workday practices opposed to whether they enjoyed the three days that they spent in Manchester or wherever it happened to be.
>
> M: OK
>
> MD: So, I've been involved in the design of those sorts of evaluations. I mean, as you know, evaluation studies are difficult to initiate, particularly when you've got lots of confounding data. (Mike Davis, England)

Indeed, as alluded to in the above citation of Mike Davis, evaluating outcomes and performance improvement in physician practices is not a straightforward process. Not only does it involve a wide range of data that must be analyzed, it is also fairly costly to conduct on a large scale and over long periods of time. Dr. Jocelyn Lockyer (Canada) explained the economic barrier of this process:

> J: We certainly have also developed short courses in which we've had physicians provide data before and after courses... you know where they've actually not only provided a perception – I do this or I do this – but also they actually pulled chart data. We don't tend to do that very often cause it's fairly costly – not only to develop the instruments and the planning time. So it has to be funded somehow and you have to have a course that's going to rule out a lot of doctors... So I mean we certainly know how to do that work. It's a question of... there isn't funding to do it at a high level on a routine basis.
>
> M: Mmmhmm
>
> J: So on a systematic basis, you can do stuff like asking people to do commitment to change, you can follow those up at three months, cause that is usually how it's done. So at the end of the course, this physician will indicate what they plan to do and then three months later you'll resurvey them with the information they provided to see whether they enforced the change fully or partially or have abandoned the change.

> M: Right. And is this something that is kind of systematic, this review after a few months? Or is this only done on a... I don't know... sporadic basis?
>
> J: Well we've done it with higher end courses that have been... When I think of higher end courses – courses that are more skills-based. You know, three or four hours on a specific topic where you're either getting a... high-end case discussions, small group, a lot of small group work, ummm... and there is some funding for it.
>
> M: OK
>
> J: As far as regular courses – 1- and 2-day courses, no we're not doing it there. (Dr. Jocelyn Lockyer, Canada)

The move towards mandatory reporting of post-activity evaluations and practice improvement results was discussed in several interviews in relation to physician revalidation and relicensure. Dr. Murray Kopelow (United States), for instance, highlighted the impact of mandatory revalidation/recertification on increased involvement by physicians in post-activity evaluations:

> "Well I think... The biggest complaint our accredited providers have is that the doctors won't fill out evaluation, the post-educational experience measurement devices, to find out what the impact was. They won't fill it out because they don't have any need to fill it out. What's going to happen with maintenance of certification and maintenance of licensure, both say... you need to demonstrate change in improvement. And the only way they're going to be able to demonstrate change in improvement is with data. And if the accredited provider is prepared to give them data on how much they have learned or what they have changed, these guys are going to be begging to be given a test, so to speak." (Dr. Murray Kopelow, United States).

In short, interviewees described modern-day CME/CPD as focused on quality, relevant, practice-based, needs-based content that goes beyond clinical information. They stressed the importance of CME/CPD outcomes, impact and performance improvement. They also described the evaluation processes in place to gage the effectiveness and impact. As we'll

see in the next section, all of these elements translate into a wide variety of formats and educational contexts for physician lifelong learners – another big shift in CME/CPD these days.

5.4. New formats, new technologies

According to participants, the new focus of CME/CPD on quality, individualized, needs-based, practice-based, relevant, and outcomes-based education (as discussed in Section C above), have directly affected the modes of delivery used in modern-day CME/CPD. Whereas CME/CPD activities in the past were limited to a small number of formats, there has been an explosion of media used for transmitting knowledge to physicians. Dr. Dave Davis (United States) described the shift in delivery formats in CME/CPD:

> "The... format of continuing education has shifted sizeably... from just didactic, so in an 8-hour day, you got 7.5 hours of lectures and a half hour for question and answer. From that kind of a model to maybe a mix of lecture plus case discussion, plus interaction, plus small group learning, plus take-home messages, plus another lecture. So the content... the formatting has changed." (Dr. Dave Davis, United States).

Interviewed participants described the "old" type of CME as "bum in seat" CME, or passive CME with little consideration for educational value, but rather a focus on the number of attendees. Carly Harrington (United States) described this in her interview:

> "I can't believe that this is a term that is actually used – and you may have heard this – it's... we learn a lot about "butts in seats" CME... you know that's kind of referred to as the old way which was about... counting how many people are sitting in your room... So it's about... how many people are coming to your meeting and that that's really the main focus." (Carly Harrinton, United States).

Dr. Craig Campbell (Canada) also described this shift from "passive" CME/CPD to a variety of learning formats, contexts and locations – including cyberspace:

> C: The place that learning occurs is now much more diversified. So, people, you know, it used to be the poor old Holiday Inn... you know... this doc sitting in a chair, bums in seats, passive recipients of the wisdom and expertise of the faculty at the front, dark room... And the premise was, if you told them what to do, they would simply absorb it and do it. Well that didn't turn out – didn't work so well. In fact, there are recent systematic reviews that Cochrane said, you know, passive learning essentially has no impact on clinical behaviors and patient outcomes. Zero.
>
> M: Mmmhmm
>
> C: So, it's gone from the Holiday Inn to a wider variety of contexts. And the learning strategies have moved from group learning alone to a whole series of learning strategies that are now part of the domain of a life-long learner... (Dr. Craig Campbell, Canada).

When asked about changes in CME/CPD formats, Dr. Dave Davis (United States) explained the contextual elements that highlight the differences between Canada and the United States. On one hand, he mentioned the quality improvement imperative in the United States and the emphasis on adult learning principles in Canada, because of the size of the primary care physician "market":

> D: What are the changes? So... I think it's huge.
>
> M: OK
>
> D: So, I think the first is in the planning process. So, at the beginning I think that we always felt that the specialists knew best. So, the orthopedic surgeon knew how to talk to the family doc, for example, both in the US and Canada. And now we understand that it's kind of a process of... kind of aligning what the specialist knows, what the teacher knows with what the learner needs, and what the patient's getting. So it's kind of three-way triangulation. So that's been significant progress. In the US, the quality improvement, if you will, market or language has really driven the day. Less about adult learning I think. In Canada, much more the adult learning principles. The learner has driven the day more. Remembering that much CME is specialist to primary care. Much of

> that CME is... In Canada, of course, that market for primary care is much bigger, right, 45% of the physician population are family physicians like myself, in Canada. Whereas it's I think it's less than 10% are family physicians in the US – or even less than that. (Dr. Dave Davis, United States).

Interviewees described the range of formats that now exist to meet the individualized needs of physicians. According to interviewees, all of these formats are becoming increasingly recognized and accredited by accrediting bodies. In the Canadian interviews, Dr. Bernard Marlow mentioned point-of-care learning along with just-in-time learning. Dr. Paul Hebert highlighted the use of medical journals. Dr. Jocelyn Lockyer discussed the availability and use of e-learning and other electronic modalities. She also mentioned "hands-on" types of activities such as mentorships and simulation-based courses.

In the English interviews, Christiane Rehwagen described "blended learning" formats, where participants engage in online learning as well as face-to-face learning. "Blended learning" and "distance learning" were mentioned by James Hill-Wheatley and Mike Davis. Mike Davis described these activities as such:

> "Most of our courses now have undergone a process of redesign to shorten the face-to-face contact time. And so most of our courses have got a virtual learning component so that instead of having a three-day course, it has a mixture of theory and practice. They are introduced to the theory online and they come and have lots of practical experiences face-to-face." (Mike Davis, England).

Carly Harrington (United States) also mentioned "multi-format" (i.e. blended) CME/CPD:

> "Also what we're finding too... And that's definitely a trend we want to move towards is...ummm... the integration of various modalities. So trying to have multi-layered, scaffolded learning where you're... where you have opportunities for... um... multiple touch points in your education. So, you might attend a live meeting, make some sort of commitment to change, have an article that you read, have a discussion group that you join... a webinar and that all of these things kind of related to the same topic or the same... you

> know, gap in knowledge, and going back to that over and over in a variety of ways and kind of completing that out... But umm really the more exposure you get to one concept, the more you're going to... you know, solidify your knowledge." (Carly Harrington, United States)

Dr. Baretta Casey (United States), emphasized the use of online learning mechanisms, especially in terms of accessibility to CME/CPD by physicians based in rural areas:

> "You might have a program such that the rural site they will have everything they need to do that workshop and they will have someone there as a coordinator, but the main person running the workshop may be at a distant site at a university or somewhere. And so they will be given then instruction to complete the workshop but it will all be done at both sites." (Dr. Baretta Casey, United States).

Indeed, according to participants, the advent of new information and communication technologies has allowed a considerable change in the range of formats available for CME/CPD, as well as the possibilities for interactivity within these activities and programs. Dr. Todd Dorman (United States) described the interactivity of modern-day CME/CPD in relation to new technologies:

> T: Now, there's a drive towards trying to make as many of the activities – or as many components within an activity – interactive. Sometimes not even recognized as such. And example would be – you might get a brochure for a CME activity today and it might look like there is a series of didactic lectures, but each of those lecturers – or presenters might be a better way of saying it – may not actually lecture. They may actually do audience response... they do small group processes during their presentation. They will likely be case-based and problem-based... that was not really true 10 years ago and 15 years ago... It was focused more at, "Hi I'm here to talk to you about X..."
>
> M: Mmmmhmm
>
> T: As opposed to... Starting with, you know, "Let's assume we have a 35-year-old woman who has X, Y, or Z." So, I think there's more – well I don't think – I know there's profoundly more interactive education today. There is... a push and a huge change towards case-based and problem-based oriented education.

> And obviously a growth of... sequential education, where you're trying to touch the... learner multiple times, not only one time on a topic. And lastly, technology obviously has come to the table as well – so growth in the use of web, in DVD and interactive asynchronous education as well. (Dr. Todd Dorman, United States).

The use of technology in audience response and interactive systems was also mentioned by Carly Harringon (United States):

> "They started breaking out... our sessions... into learning categories. So some are didactic, some are very interactive with discussions and questions and answers... They have procedurals that are hands-on, where you actually, you know, work with it... They utilize audience response systems, electronic response systems a lot... to have the audience participating kind of all the way through. Which helps to assess, you know, gaps in knowledge and performance as you go..." (Carly Harrington, United States).

Some participants mentioned that the shift away from didactic, lecture-based formats in modern-day CME would eventually be reversed, or at least evened out. Indeed, Dr. Bernard Marlow (Canada) described how physicians, CME/CPD providers and researchers are now realizing the value of older (i.e. more didactic) formats:

> B: I think as doctors are... perhaps feeling more and more isolated or need to be "live" as we communicate more and more electronically, I think there is still a need for people to get together face to face and to be able to interact with each other on a live basis. And so these meetings are... there's a trend to continuing. So if you read Dave Davis' 1998 work in terms of lectures don't work and then his subsequent attempt to retract what he was saying or clarify what he was saying, which had a profound effect on... Now people are going back the other way and saying these programs are in fact valuable. And in fact, in Australia, they've mandated that physicians get 40 credits "live" per year.
>
> M: OK
>
> B: Because I think that if a physician got all of their credits online, sitting alone in their room at night, that it may be... that they would be considered to be a physician at risk because of their isolation. (Dr. Bernard Marlow, Canada).

Indeed, participants explained that despite the shift towards new technology and new formats in CME/CPD, providers are increasingly finding value in lectures and "old" learning modalities. These types of activities provide opportunities for "scanning" (as described earlier) and for live, face-to-face interactions between participants. Dr. Craig Campbell (Canada) described the advantages of this type of group learning:

> "You know, that learning is a social process. So it's good to be with your colleagues and sort of find out what they're doing and sort of review what you're doing or what you think you're doing in relationship to what experts are suggesting you should do. Some people describe group learning as a mental health break from practice, which I thought was quite interesting... The ability to step outside practice for a while and start reflecting on how you're doing and what you know." (Dr. Craig Campbell, Canada).

Dr. Murray Kopelow (United States) emphasized that the issue with learning modalities is not so much the variety of formats that are available, but rather that these formats "match" the learning objectives, goals and expected outcomes of a CME/CPD activity:

> MK: So we don't look at the format of the activity as much as we look at the format of the organization that delivers the education in support of the continuing professional development of the doctors. And we say to them... you must start at a place that matters to their practice and take them to another place that... and measure that change... and use a format that is appropriate to what you are trying to accomplish. That's basically what we say.
>
> M: So it's up to them to decide on the format?
>
> MK: It's up to the accredited provider to... And if they... if they want to change knowledge, then it is appropriate for them to use something didactic or plenary... you give them a book, you make them read a screen on a computer, you give them a lecture... and it changes what they know. But if you want people to put that knowledge into action, if you want people to develop a new strategy for their professional practice, then you need to go beyond that. That's what the literature says. (Dr. Murray Kopelow, United States).

In summary, according to participants, the wide variety of formats available in CME/CPD aim at providing physicians with learning modalities that fit with their individual, practice-based needs (i.e. the new focus of CME/CPD as described in Part C above).

Dr. Murray Kopelow (United States) explained this process as trying to "do the right thing at the right time for the right person." He described this process using the accreditation criteria of the Accreditation Council for Continuing Medical Education (ACCME):

> MK: Criteria 2 says identify the need based on the professional practice gaps. So docs say... we've failed to identify the family violence that's going on. That's our problem, our practice gap.
>
> M: Yep
>
> MK: And an accredited provider needs to say... Well why is that? Is it that they don't know about family violence? About what it looks like? And how common it is? And where it occurs? Or do they not know to ask about it? These are two different things. If they don't know, they don't know... Or they think they know and they don't. And that's the knowledge thing that you have to monitor. But if they do know about family violence but they just don't know the question to ask a person to find out if it's occurring, that's a different educational thing. So that's C2. C3 is design your activity to change something. So you identify that they don't have a strategy for asking questions. So that means that the educational activities that you ask—that you design—need to be designed to actual get people to be able to ask questions. So you have to show them different questions, they have to hear different questions, they have to practice different questions, they have to use simulated patients to do it, you have to watch to see... you have to ask them... so how many times did you do this in the last month...
>
> MK: And that's the right activity for what it is that you are trying to accomplish. And Criteria 4, 5, and 6 talk about using the right formats and basing it on the kinds of competencies that our people are trying to... umm... address in the United States. And that we should always make sure that what they're getting matches their scope of practice.
>
> M: Mmmhmm
>
> MK: That the people that are in the room should be getting education that matches what they do in practice.
>
> M: Yep

> MK: So it's a very... the right thing at the right time for the right person. If you're doing it individualized, it's easy as you... as you... educated for larger and larger groups, it becomes more and more of a challenge to give them what they really need. You get more and more people in the room where it's not exactly the perfect activity. Um, so it's... it's not so much the format... that there are formats that matter... that there are the right formats. It's that there is the right thing to do for what it is you're trying to accomplish. (Dr. Murray Kopelow, United States).

5.5. Contextual elements

The environment or context surrounding the CME/CPD process was discussed in a variety of ways by the participants who were interviewed. Country-specific regulatory and economic elements were the most often cited issues, followed closely by socio-cultural and ethical considerations. We have attempted to separate these contextual elements into two categories (regulatory and economic; socio-cultural and ethical) for the purposes of the presentation of our research results, to reflect the fact that participants often intertwined regulatory and economic factors, as well as ethical, social and cultural issues, amongst others, thus highlighting their interconnected nature.

5.5.1. Regulatory and economic factors

We have already alluded to some of the economic factors mentioned by interviewees with regards to the "business" of CME/CPD, including profits, budgets and an overall concern for funding. We will now discuss these elements in relation to the changing regulatory landscape in continuing medical education and professional development.

5.5.1.1. Funding

In terms of funding, most of the interviewees mentioned the economic impact of changing regulation regarding CME/CPD activities. In particular, they highlighted the increasing withdrawal of pharmaceutical (or commercial) funding of CME/CPD. Dr. Bernard Marlow (Canada), described the changes:

> B: The other big change is in relation to the pharmaceutical industry. Back in those days, the pharmaceutical industry was the major – the only – funder and a large provider of CME. And the funding from industry has declined – as has their involvement – as the rules become more and more rigorous in terms of preventing education from being used as promotion. (Dr. Bernard Marlow, Canada).

Regulatory changes regarding the separation of the pharmaceutical industry from CME/CPD in terms of funding have not only affected Canada. In fact, participants mentioned that the impetus for this type of regulatory change was in the United States to begin with, then spreading to Canada and elsewhere, including England and the United Kingdom, as Dr. Jocelyn Lockyer (Canada) explained:

> J: There's a lot of pushback against industry presence in continuing education. So I think they're retracting at this point in time, but they'll come back. But right now, they're retracting with the pressure. And it's not just Canadian pressure. Like I would go so far as to say it's probably more US and International pressure that's getting them out of CME provision and development.
>
> M: And are you... From this pressure are you referring to some of the... the Sunshine Acts or things like that that are going on in the States? Or anything beyond that?
>
> J: Well yes, there has been lots of work in the US around removing them and setting up pretty strict criteria about what they can and can't do in CME. (Dr. Jocelyn Lockyer, Canada)

Dr. Murray Kopelow explained the reasons for the regulatory changes in the United States versus Canada, alluding to the much bigger market for CME/CPD in the United States:

> "In the United States, the stakes are much higher with respect to the relationships with industry than they are in Canada because the systems are very different. Although the principles and the ethics and the morals and all those things are the same, the... the stakes are higher... And the amount of money that changes hands in continuing medical education in the United States is 2 or 3 billion dollars a year. And in Canada, it's in the hundreds of thousands of dollars, so..." (Murray Kopelow, United States)

Dr. Todd Dorman (United States) described actual changes to the role of pharmaceutical companies within CME/CPD, mentioning that these commercial companies used to be accredited providers of educational content and activities:

> T: So prior to the year 2000 as an example, commercial entities, so a pharmaceutical company, could be an accredited provider in the United States.
>
> M: Mmmhmm
>
> T: And about 1999 that ended. The last person--- the last company's term as an accredited provider faded out in the late '99, very early 2000 timeframe, so it's now been 11 years since a... commercial entity could have that level of involvement in CME. And so, you can imagine that a CME put on by... you know Pfizer or Eli Lilly or sanofi-aventis would be profoundly different from CME put on when they are not allowed to be an accredited provider. (Dr. Todd Dorman, United States)[39].

Dr. Dorman also described the specific regulatory changes, the introduction of the ACCME's Standards for Commercial Support, which took place in the United States in the late 1990s:

> The Standards of Commercial Support by the accreditor were really first promulgated in the late 1990s, around 1998. That was sort of version one. The second version, which is really the... very close to the present version... they were updated in 2004, so just between 1998 and today, there has been... So prior to '98, there was no recognition and no process really for this whole issue of having standards of commercial support and how to create distance and

[39] In the above citation, Dr. Dorman alludes to the possible quality issues regarding pharmaceutical CME/CPD. We will touch upon this range of discussions with Dr. Dorman and other interview participants in the socio-cultural and ethical section below.

> firewalls and to ensure that there was not undue influence. The Standards in 2004 upped the ante on that and further created... a thicker, more dense, more controlled firewall of that process. And, even in '06 through '08, the change in accreditation process along with additional clarifications of some of the issues related to industry. So prior to '06, a company could say, we think that education on diabetes is lacking in this country because our sales force keeps coming back saying that when they're talking to physicians, physicians say, you know, I just don't know how to manage diabetes. Or I don't know how to teach my patients inhalers. Or... whatever. And we could then use that information to drive the next activity. From 2006 till today, the policy is that they cannot suggest in a direct or a nuanced fashion, either a speaker or a topic...

Indeed, several participants highlighted the more "insalubrious" side of pharmaceutical funding of CME (from skewed, overly biased topics to promotional materials being sold as education). However, according to interviewees, pharma funding and sponsorship is also a positive and helps to keep costs down for physician participants, as explained by Christiane Rehwagen (England):

> C: I mean at the moment it's also really budget. It's a problem that budgets are cut and that people have less money to pay. And I mean we are... BMJ Masterclasses also has some pharma sponsorship. We have a lunchtime symposium and we have some external exhibition... and I mean exhibition of other companies as well, but most of it is pharma. And I mean we are doing that because it helps to keep our prices... fees down... the fees for the delagates down... if we wouldn't have that, we would have to raise the fees for them.
>
> M: And so the relationship with pharma is more where they kind of exhibit.
>
> C: It's really a kind of exhibition and sponsored symposium approach, that's all. I mean they don't influence any of the content that we are doing in the morning or in the afternoon. I mean we are deciding on the topics and on the content. They have nothing to do with this... All they do is suggest a speaker and content for the sponsored symposium to us and we have a look and see if it's educational and fits in the program and then we accept it. And yes, it happens after lunch and is optional and it doesn't count to the hours of education of the day. (Christiane Rehwagen, England).

Dr. Jocelyn Lockyer (Canada) explained how the changing regulatory and economic environments of CME/CPD are shifting the overall cost structure, ultimately increasing prices for physicians:

> "Recently there was so much free CME through pharma that tuition were deliberately low and so there wasn't enough money in the system to support high-quality." (Dr. Jocelyn Lockyer, Canada).

Dr. Bernard Marlow (Canada) also described how physicians and governments, rather than pharmaceutical companies, are now in charge of funding CME/CPD:

> M: Mmmhmm and where does the funding come nowadays if funding from the pharma industry has declined?
>
> B: It's self-funded. So doctors pay registration fees for their education. And the government has become a player in education as well in terms of providing funding for some educational programs.
>
> M: OK
>
> B: And with the various association agreements across the country, doctors are receiving funding from the government that can be used towards their own education, their own selection of education. (Dr. Bernard Marlow, Canada)

Interviewees described self-funding of CME/CPD as the "new norm" for physicians. However, they also explained why physicians are somewhat reluctant to adapt to this new reality. Indeed, as was mentioned by several interview participants, some physicians have a sense of entitlement that they should not have to pay for their continuing medical education and professional development. This "culture of entitlement" is slowly changing, as described by Dr. François Goulet (Canada):

> F: So, first, there has been a progressive retraction of the pharmaceutical industry. It is still there, still present. But when it is present, it is in association with accredited organisations, whereas before it could be totally independent. I would say, with more autonomy, more latitude.

M: OK

F: The second thing that has changed... There have been changes in cultures regarding that. As industry began removing itself, doctors started understanding that... Because before, in Quebec and in the rest of Canada it was the same, the doctor said, "I don't have to pay for my continuing education."

M: Yes.

F: In France, you never pay for continuing education. "I am a great doctor. People pay me to do continuing education." I find that a bit wrong, but that's how it is. Industry was so present that doctors got continuing education for low, low, low, low prices. Now, more and more, they are understanding that they have to pay for continuing education... sometimes more, sometimes less, but I think there is a change in cultures regarding that... (Dr. François Goulet, Canada)

Both from the United States, Dr. Baretta Casey and Dr. Murray Kopelow mentioned another aspect – another potential drawback – of the decreased pharmaceutical funding of CME/CPD: the delay in transferring information about pharmaceutical products or information regarding clinical trial results.

B: One of the biggest changes that has affected the landscape is the move to separate continuing medical education from the... ummm... bias or undue influence from outside organizations such as pharma or pharmaceutical companies, device companies, those types of programs. And to a great extent, that is exactly what should be done. Ummm. As in all changes we have seen in the years past, the... ummm... depth at which these changes are occurring seems to always go far to one side or the other. So in trying to correct some of the problems that have occurred in CME, they have almost shift to the only answer is absolute separatation altogether.

M: Mmmhmm

B: And that in itself has some problems. Because if you do ummm that may delay getting information out about new medications or new devices that could help people. Ummm. And I think there could have been ways developed to assure that that was done in a non biased fashion rather than saying, well the only way you can hear about it is after two or three years of it being in the

> field and then having a peer tell you about it with a complete separation from the people who made the device or the drug. (Dr. Baretta Casey, United States)

Dr. Kopelow felt so strongly about mentioning this issue of delayed knowledge transfer that he contacted the interviewer to schedule a second (short) phone interview to ensure that this topic – a "fundamental paradox," according to him – was discussed:

> MK: [In] the United States, there's a great deal of discovery that goes on inside of industry, there's a great deal of partnership with the profession and industry, where the profession is acting as the agent of industry. And our rules, under the Doctorate of Independence, um, block this translation of discovery into first use and clinical use and application.
>
> M: So is this delaying possible... possible changes in guidelines or changes in treatments?
>
> MK: Right! So they, so both industry and the profession.. In 200—We started to be specific about our rules in this discovery phase in 2007 and 2008. And it took a while for everybody to catch on. So in 2009, and early 2010, industry and... Well industry lobbied the profession and the profession phoned us up and said... This is a disaster. This is... this is a crisis. This is unconstitutional. You know, every word you could describe. This is censorship, this is stupid.
>
> M: Yep
>
> MK: And... But the thing that got us is when somebody said, you know, somebody is going to cure cancer and they're going to say, you know, we discovered a cure for cancer three years ago, but we couldn't tell anybody cause Kopelow wouldn't let us. (Dr. Murray Kopelow, United States).

In short, both the pros and cons of the regulatory and economic changes regarding industry funding in CME/CPD were observed and discussed in detail by most of the interview participants. On the "pro" side, interviewees highlighted the decreased costs of CME to doctors and other healthcare professionals when such activities are subsidized by pharma companies. Furthermore, the participation of pharma companies in CME helps speed up the translation of research into practice. However, the "darker" side of pharma funding was extremely prevalent in most of the interviews. Many interviewees found pharma

involvement "as it used to be" in the last decade unhealthy, and at times completely contrary to the goals and values of continuing education. Undue influence from the use of pharmaceutical marketing materials and promoting certain drugs and treatments while completely ignoring others, for instance, cannot be deemed appropriate, balanced CME. Furthermore, pharmaceutical funding of certain diseases requiring long-term treatment means that other potentially less chronically-treated illnesses were ignored in CME.

Interviewees highlighted the vast amounts of government and public pressure that have caused the pharmaceutical industry to retract its funding, saying that the situation today is much improved from where it stood a decade or two ago.

Discussions emerged from all three of the countries under study, but American and Canadian interviewees definitely stressed this pharma funding issue more than their English counterparts. (Out of the four English interviews that were conducted, the only mention of pharmaceutical funding was in Christiane Rehwagen's interview, where (as discussed above) she stated that pharmaceutical funding was beneficial for cost reduction.)

5.5.1.2. Beyond funding – other regulatory and economic factors

Beyond issues of commercial funding, participants also mentioned the changing regulation regarding the definition of roles and responsibilities for all those involved in the CME/CPD knowledge transfer/translation process. This included the way accrediting bodies attribute CME/CPD credits to their members, especially in relation to the new types of formats and learning modalities available to physicians. As mentioned by participants, regulatory bodies are in charge of defining which types or categories of activities are "approved" or accredited for CME/CPD credit, and they also dictate how many credits must be gained in each category by physicians. New formats of CME/CPD bring up new questions about the accreditation and regulation process, as described by Mike Davis (England):

> "Among the fears that people have about the conventional models of CPD like training programs and you know, various sorts of formal events... It was very

> easy for those to be allocated CPD points because it was sort of informal formulae for saying X number of hours equals X number of CPD points and so on. Whereas it was very hard to sort of say... well I had a very, very useful conversation with a senior colleague the other day in the staff room or wherever... or whatever formal or informal location it was... and I've learned a great deal about how I might next manage such and such a case. And that was the challenge I think to the work-based movement that CPD in the workplace, when it's conducted on that basis, i.e. professional conversations between colleagues in attempting to resolve issues of common and shared concern, didn't fit very easily into a mechanism where... you had to present evidence and claim a specific number of points for the completion of that activity." (Mike Davis, England).

Dr. Bernard Marlow (Canada) emphasized the need for a variety of accredited formats of CME/CPD. However, he mentioned that knowing how to accredit this variety of formats is not easy in practice, citing the example of the Royal College of Physicians and Surgeons of Canada:

> "I think that a good continuing professional development would include many different types. And we're fighting and struggling right now about what they should be and how we can ensure that people get that variety of activities. In the Royal College, they have 6 different categories with different types of activities. And after the first 5 years – because they're fairly new to the game – they found their members weren't very happy and so they're simplifying it down to three categories and putting broad ranges of activities within each category. And so it's difficult to get that. We often say that you shouldn't get all of your credits from a single activity, but it's very difficult to put into practice." (Dr. Bernard Marlow, Canada).

Interviewees also mentioned the rules and guidelines that exist regarding how regulatory and accrediting bodies accredit the CME/CPD programs of providers, and what criteria they look at to ensure quality, relevant content (as discussed in Section C above). Of particular note, interview participants mentioned the respect of rules regarding commercial support and pharmaceutical company involvement in CME/CPD activities. For instance, Carly

Harrington described the application of the ACCME's Standards for Commercial Support in the accreditation process at the American Academy of Family Physicians:

> "One of our main concerns is making sure that you comply with the Standards for Commercial Support. Well if at any point during this where a brand name is mentioned, whether they've done so responsibly and appropriately, which we have specific guidelines around. If there any indication of bias towards, you know, trying to sell a product or service... So all those things are able to be really thoroughly reviewed in that process." (Carly Harrington, United States).

Participants related the regulatory and economic issues raised in CME/CPD to political lobbying. Dr. Baretta Casey (United States) mentioned the development of regulatory changes that took place in the United States, regulations which emerged from political pressures to separate CME/CPD from industry:

> B: So, definitely there have been a tremendous amount of political push for that separation. And that has now made its way down into all the accrediting organizations in the US which are... ummm three. There's the ACCME, there is the Osteopathic accrediting system, and then there is AAFP, the Academy of Family Physicians' accrediting system. So we are three systems in the US currently.
>
> M: OK
>
> B: And they have all developed new guidelines to say that these are the ways that medical education should be performed or these are the guidelines under which they should be performed.
>
> M: Mmmhmm. And so the CME providers have had to shift their content and their structures to fit with those new guidelines, I imagine.
>
> B: Absolutely. (Dr. Baretta Casey, United States).

Most notably, of all the political pressures highlighted by participants, several interviewees mentioned the influence of Senator Chuck Grassley's transparency campaign and

investigations in the United States. Dr. Dave Davis (United States) explained the situation in his interview:

> D: And in the US, by chance, one of the senators, Senator Grassley...
>
> M: Grassley
>
> D: Has really picked up on the notion of commercial support for continuing education.
>
> M: Yep.
>
> D: Unusually, he's a Republican and you wouldn't think it because it's an attack on business, if you will. But he's... he's really picked up on it and has shone quite a bright light on it. And so, to his credit, and... I must say that I've seen a lot more attention paid to the issue, alot more sensitivity to the issue since he's come on the scene. (Dr. Dave Davis, United States)

As Dr. Jocelyn Lockyer (Canada) discussed, United States-based regulations and decisions often make their way into Canada:

> "I think some of those things have colored what we can and can't do in Canada. Just because if you can't do it in the US, there tends to be a spillover in Canada." (Dr. Jocelyn Lockyer, Canada).

Dr. Bernard Marlow (Canada) also agreed with this US-to-Canada "spillover" view in his interview:

> "[A] lot of this was driven by the Senate and the one senator in particular, Grassley, who has made a lot of the changes in the US in regards to transparency. We are looking at... there are several groups looking at conflict of interest and disclosure in Canada now. But a lot of that has been stimulated from the US." (Dr. Bernard Marlow, Canada).

A UK-specific example of political pressure on regulatory changes was also brought up on several occasions by interview participants. This was the case of Harold Shipman, the former doctor who was thought to have killed over 200 people. As described by participants, the

Shipman Inquiry following Shipman's imprisonment brought about many regulatory changes in the British healthcare system, including the removal of self-regulation by the medical profession, and the introduction of mandatory revalidation and recertification in England and elsewhere around the world:

> "And actually we always talk about the UK and I always say that the stimulus for a lot of the change in the UK was from a mass murderer, you know, and in part that's what stimulated the public's interest and the physicians lost their ability to self-regulate. And so now... But apparently they're going back... the new government is softening their stance... how much to dictate to doctors about their education and relicensure..." (Dr. Bernard Marlow, Canada).

Indeed, the "grey area" of government involvement and regulation, especially the controversial issue regarding making revalidation and recertification mandatory brought about a few vivid discussions from interview participants. Mike Davis (England), for instance, described it as such:

> "And, you know, the feeling was that doctors... as arising out of his case... the feeling was that there had to be more, if you like, supervision of doctors' performance. But every... all of the doctors you talk to believe that Harold Shipman would have passed any revalidation exercise known to the system at the present time, including, you know, the extent to which he engaged in CPD, because he was an active CPD practitioner himself. So, you know, among the questions that people sort of say... talk about within the context of validation... is what is it for? And would it have prevented the likes of this particular man who, you know, did all of these awful things?" (Mike Davis, England).

As discussed by interviewees, the Shipman Inquiry brought about more than regulatory changes – it also made doctors look more closely at their profession, at their accountability to the public, and at their ability to "self-regulate." These issues relate directly to socio-cultural and ethical considerations, which will be discussed in the next section.

5.5.2. Ethical and socio-cultural factors

As alluded to earlier, ethical and socio-cultural factors were often mentioned concurrently by interviewees. In fact, in certain discussions, little distinction was made between the two concepts. This highlights the interconnected nature of the various contextual elements involved in the CME/CPD knowledge transfer/translation process.

5.5.2.1. Ethical issues in relation to socio-cultural factors

In terms of ethics, discussions often related to issues of physician accountability, responsibility to the public, professionalism, and maintaining public confidence, all within the specific socio-cultural landscape of the country under discussion. For instance, Dr. Craig Campbell (Canada) described the differences in the events that led to regulatory changes in the CME/CPD system, along with increased introspection within the medical field in Canada compared to the United States and England:

> M: And... how do you think this shift happened? Is it because of public... not scrutiny, but the needs of patients to want to make sure their doctors are...
>
> C: I think that's always been the case, but I don't think that's been as evident to me in Canada as you would you see in the UK... or the US.
>
> M: Yeh.
>
> C: I mean, we didn't have... We actually had our own Bristol in Canada.
>
> M: OK
>
> C: But the difference between the UK and Canada in this respect is the UK would say that they have a single national health system, correct. How many do you think we have in Canada?
>
> M: I guess you could say... the provinces...
>
> C: We have 13, with the territories.
>
> M: Yeah
>
> C: And so what happened in Manitoba with the Cardiac care unit – Cardiac Surgery for Pediatrics was the same as what happened in the UK, but it was confined to Manitoba. So we didn't have the same public outcry across the

> national system. So I don't think it's been that. I think that's been part of it and there's increasing concern about the quality of care, the safety of the system, you know, the cost-effectiveness of the system. And patients are... you see it in the paper. I think what's driven the change has been more from the CME profession itself working with CPD organizations and national Colleges, like the Royal College. I think this has been more about a culture shift than it has been anything else in CPD. And it's really about a new expectation for the profession around accountability and transparency of how we are managing as a self-regulating profession, the competencies that we profess to hold. And it's part... I think it's been more the profession holding the profession accountable for this. (Dr. Craig Campbell, Canada).

Dr. François Goulet also mentioned the differing cultural mindsets and contexts within Canada (Québec) and the United States regarding mandatory recertification and/or revalidation:

> F: The English have different pressures and different structures and different cultures.
>
> M: What do you think is the biggest difference?
>
> F: Well, the difference is that they had big stories of Shipmen and company, so there was pressure from professional Orders and from the authorities to better support physicians. And maybe they were not sufficiently supported back in the day. For us, professional inspection visits, the Professional Code in Quebec exists since '74. We've been doing that for 40 years. I'm not saying there won't be horror stories, that there won't be any more serious professional errors, but I would say that...the culture and the structures already in place since 1974 make the risk smaller. I'm not saying that it can't happen, but the risk is smaller.
>
> M: And, compared to the United States? Do you see a difference?
>
> F: Well the difference is that continuing education in the United States is a business. Everything is the United States is a business. (Dr. François Goulet, Canada).

Beyond country-specific issues, the cultural concept of "accountability" was discussed by several of the interviewees. In fact, for most, CME/CPD was seen as a sort of method to

keep physicians up-to-date and accountable for their professional behavior and for the health and safety of their patients and of the wider population. This was the argument mentioned by many for mandatory revalidation and recertification.

Dr. Jocelyn Lockyer (Canada) mentioned in her interview that both internal and external pressures have made the medical profession more self-aware and accountable over the years:

> J: Well I think it's come from internal and external forces. Externally, the... some of the huge problems. I'm thinking the Shipman inquiry in the United Kingdom...
>
> M: Yeah
>
> J: So there's been sort of things external to the profession that have said to the profession ... hey we better make sure we clean up our act and in some cases the government in the UK stepped in and said, "This is not on and we gotta have some structure." So there's external stuff.
>
> M: Mmmhmm
>
> J: Internally, I think the... medicine is self-regulating and they've recognized that they have to do what is required to maintain public confidence in the profession.
>
> M: Right
>
> J: And so they've made some pretty key decisions themselves so that these positions aren't imposed on them.
>
> M: OK
>
> J: So they've been proactive. It's been internal as well as external, but it was kind of a perfect collision. (Dr. Jocelyn Lockyer, Canada).

As described by Mike Davis (England), most physicians see continuing education and professional development as a crucial duty or responsibility of their role:

> "[From] our respondents, CPD was seen of as something that was essential to their day-to-day practice. They did... the vast majority of them saw it as being

> part of you know an obligation of being an effective clinician that they would continue to see themselves as learners. And that is actually very common with the whole notion of being an adult learner anyways, isn't it. It's about it being a life-long process, rather than a series of single events. And I think that that will continue to be the case, whether revalidation is a characteristic feature of their experiences or not. Inevitably CPD will be regarded as being one of the measures of people's active engagement with the process of being appropriately registered and certified to be a doctor." (Mike Davis, England).

Issues of accountability and professionalism were often mentioned in tandem with discussions on codes of ethics and professional conduct, and on disclosures of financial interests, transparency and separation from the influence of pharma or other commercial entities. Overall, the emphasis was on appropriate behavior for physicians, for the CME/CPD providers, and for all those involved in the system, as described by Dr. Murray Kopelow (United States):

> MK: So, we focus on making sure that the educators, the continuing medical education providers, the physicians understand the difference between right and wrong and it's society. And civil society is dependent on self-monitoring and proper behavior. You know... the old saying about, why don't you go through a red light at 4:30 in the morning when there isn't a car for 5 million miles?
>
> M: Yeah
>
> MK: That's... we work hard to get all of our players to that place. So they understand what is the right way to behave. (Dr. Murray Kopelow, United States).

5.5.2.2. Other socio-cultural factors

Several country-specific socio-cultural elements were highlighted by participants in discussions on issues beyond ethics, professionalism and accountability. For instance, when asked to compare and contrast the CME/CPD systems in the countries under study,

interviewees often brought up examples of attitudes, mentalities, and motivations, which we have classified under the "socio-cultural" category for the purposes of this study.

We have already mentioned the emphasis of interviewees on the "business" mindset prevalent in CME/CPD in the United States. Related discussions also described the socio-cultural values of individualism and entrepreneurialism – both of which characterize the American healthcare system and CME landscape. In contrast, participants mentioned the prevailing ideal in Canada of healthcare as a national resource and a given right. Dr. Dave Davis' discussion summarizes the differing viewpoints between the two countries:

> D: Umm... So let me try and put some context around this. I think it's important to understand the context.
>
> M: Sure.
>
> D: So, I think one of the driving forces in Canada, which does not exist in the US, and probably won't for some time, is this culture of healthcare as a right. And in that culture that it's a social good, physicians and physician learning has been probably more broadly embraced.
>
> M: OK
>
> D: So, it's easier in the Canadian context to talk about continuing professional development and primary care as a... constitutional right, as a human right and as a government-inspired initiative, sort of a... population health perspective. Whereas in the US--- and therefore if you frame continuing professional development in Canada and continuing education in that context, it becomes a little bit easier to understand that the uptake is much more... related to... so... to how am I doing, how my patient's doing, is there a way that I could make that better for them? And a little less because our financial incentives are less in Canada – a little of that entrepreneurial spirit.
>
> M: Mmm
>
> D: And much more of that, yeah, I'm developing myself, I'm developing my practice, I'm improving my practice as I go along. Ummm. I don't want to paint it as so different that you wouldn't recognize each other. You know, I don't want to say that Canadians have one construct at the end of a long continuum and Americans another. But I will portray the American context as much more entrepreneurial.

M: Mmmmhmmm

D: Independent, autonomous. The fiction that the rational, autonomous, un-integrated decision-maker is the physician is much more alive and well in the US than it is in Canada.

M: OK

D: It's a really interesting phenomenon. So... that being said, therefore, the context of continuing education and professional development in the US is much more financially-driven. As a result, commercial interests in the US outdo the commercial interests in continuing education in Canada by about 2 to 1 by population.

M: OK

D: And so, CME is seen as a commodity. In fact, healthcare is seen as a commodity. So you may have seen some pushback on the part of federal court judges on the Healthcare Reform Act. And they... they are equating healthcare with a commodity like buying broccoli.

M: Mmmhmm

D: Whereas you and I, as Canadians, would think... hmmm, no it's a constitutional right that I have access to healthcare. (Dr. Dave Davis, United States).

5.6. Summary

Overall, participants highlighted a number of recurring themes during their in-depth, semi-structured interviews. As portrayed in this chapter, these included the view of CME/CPD as a field and profession; the "business" of CME/CPD; the new focus of CME/CPD; the new formats (and technologies) used in CME/CPD; and the impact of economic, regulatory, ethical and socio-cultural contextual elements on the overall CME/CPD process. Now that we have presented these findings, the next chapter will highlight our discussion and analysis, basing ourselves on our Review of the Literature, our Conceptual Framework and the additional research conducted as part of our description of the research context.

CHAPTER 6
ANALYSIS OF RESULTS AND DISCUSSION

In the previous section, we presented the results of our 14 interviews conducted with participants in Canada, the United States and England. We provided participant citations to highlight and describe our five categories of findings: CME/CPD as a field and profession; the "business" of CME/CPD; the new focus of CME/CPD; the new formats used in CME/CPD, the impact of contextual elements on the CME/CPD process.

In this section, we discuss these findings in relation to the theoretical concepts and other elements introduced in our Review of the Literature and Conceptual Framework. We analyze how the elements discussed in the participant interviews affect the knowledge transfer/translation process in CME/CPD, ultimately addressing our main research question:

How do contextual elements influence the CME/CPD knowledge transfer/translation process and stakeholders, and how do these influences compare in Canada, the United States and England?

In order to answer the research question, we begin our discussion of our research findings using the categories at the basis of all knowledge transfer/translation processes: *source*, *content*, *medium*, and *user* (as described in Shannon and Weaver's (1949) model as well as the subsequent models discussed in our Literature Review.) Each of the basic elements of the transfer/translation process is analyzed in terms of the influence of country-specific contextual characteristics, as per our research findings.

Next, we provide an overview of the influence of contextual elements, stating which elements we believe are particularly influential in each country under study. We highlight the interdependent nature of all of these dimensions on the CME/CPD knowledge transfer/translation process. Finally, we summarize our findings and our answer to this study's research question.

6.1. Knowledge sources: Evidence-based research and the withdrawal of pharma

Interviews with participants highlighted two emerging traits related to sources of knowledge: the focus on evidence-based research and the withdrawal of pharmaceutical companies and other commercial entities as providers of knowledge. Both of these issues are highly correlated, since the departure of pharma from CME/CPD stems from the growing emphasis on un-biased, balanced sources of knowledge by CME/CPD providers. Indeed, as we heard in our interviews, participants mentioned that CME/CPD has progressively moved away from "non-legitimate" sources of knowledge and information:

> B: One of the biggest changes that has affected the landscape is the move to separate continuing medical education from the... ummm... bias or undue influence from outside organizations such as pharma or pharmaceutical companies, device companies, those types of programs. And to a great extent, that is exactly what should be done. Ummm. As in all changes we have seen in the years past, the... ummm... depth at which these changes are occurring seems to always go far to one side or the other. So in trying to correct some of the problems that have occurred in CME, they have almost shift to the only answer is absolute separatation altogether.
>
> M: Mmmhmm
>
> B: And that in itself has some problems. Because if you do ummm that may delay getting information out about new medications or new devices that could help people. Ummm. And I think there could have been ways developed to assure that that was done in a non biased fashion rather than saying, well the only way you can hear about it is after two or three years of it being in the field and then having a peer tell you about it with a complete separation from the people who made the device or the drug. (Dr. Baretta Casey, United States)

Current best practices stress the importance of peer-reviewed, scientific, evidence-based research findings, guidelines and other policies. As such, the increased focus on *where* knowledge comes from (the source) was a clear finding from the interviews.

The involvement of the pharmaceutical industry (and other commercial entities) in the entire CME/CPD process – from funding to suggesting topics and speakers to hosting events – has dwindled over the years because of concerns regarding content:

> B: The other big change is in relation to the pharmaceutical industry. Back in those days, the pharmaceutical industry was the major – the only – funder and a large provider of CME. And the funding from industry has declined – as has their involvement – as the rules become more and more rigorous in terms of preventing education from being used as promotion. (Dr. Bernard Marlow, Canada).

As participants suggested, the motivations of for-profit pharmaceutical and device companies in promoting their products do not necessarily translate into effective, quality educational material. Interviewees mentioned that as sources of information and knowledge, these entities might be biased in downplaying the side effects of treatments and might push research pertaining to chronic diseases, treatable by pharmaceutical products, ignoring other conditions, and other, non-medicinal short-term treatment options.

Furthermore, as we noted in our literature review, knowledge transfer and translation is generally more successful when knowledge sources (i.e. researchers or creators of knowledge) take into account the needs of potential users (NCDDR, 1996, p. 16). As we will describe later, pharmaceutical companies did not necessarily reflect this needs-focused base of knowledge.

The legitimacy of pharmaceutical companies and other commercial entities as sources of knowledge in CME/CPD has thus been questioned. Because of this, accrediting bodies are more watchful of undue influence and other "promotional" practices by these companies in CME/CPD. The pharmaceutical (and device) companies themselves, in order to gain legitimacy and avoid tarnishing their image, have willingly reduced their involvement in the CME/CPD process.

6.1.1. Knowledge sources – Contextual differences

The focus on evidence-based, non-pharmaceutical sources of knowledge was mentioned by interviewees in all three countries under study: Canada, the United States and England. Discussions around this topic pertained mostly to the ethical dimension of providing quality content as CME/CPD to physicians,[40] and also to maintain the legitimacy of CME/CPD as a field of research and a profession, as well as helping physicians keep up-to-date with the vast amounts of new knowledge that characterize our modern-day knowledge society. Another contextual dimension that was mentioned was that of regulatory policies put in place by accrediting bodies to monitor the acceptability of CME/CPD content.

Both of these contextual elements – the ethical and regulatory dimensions – were mentioned equally by participants from each of the countries under study. Although these elements have a direct effect on CME/CPD knowledge transfer/translation process, by limiting the involvement of pharmaceutical companies and defining which sources of knowledge/information are legitimate, no real differences based on country-specific contexts could be observed. Each country under study seemed to have a similar focus on providing quality CME/CPD, using evidence-based sources of information.

Although all three countries were similar in the ethical and regulatory respect, it is important to note that two interviewees from the United States – Dr. Baretta Casey and Dr. Murray Kopelow – highlighted the particularities of the American context, where regulation regarding the separation of the pharmaceutical industry as a source of knowledge for CME/CPD went perhaps a step too far. Indeed, as participants explained, the ACCME had restricted reporting on the discovery phase of a new product or treatment within CME/CPD activities. This led to possible delays in transferring and translating important research-based knowledge into practice and eventually led to public outcry:

> MK: [In] the United States, there's a great deal of discovery that goes on inside of industry, there's a great deal of partnership with the profession and industry,

[40] In the next section, we will focus on aspects of content in the CME/CPD knowledge transfer/translation process.

> where the profession is acting as the agent of industry. And our rules, under the Doctorate of Independence, um, block this translation of discovery into first use and clinical use and application.
>
> M: So is this delaying possible... possible changes in guidelines or changes in treatments?
>
> MK: Right! So they, so both industry and the profession.. In 200—We started to be specific about our rules in this discovery phase in 2007 and 2008. And it took a while for everybody to catch on. So in 2009, and early 2010, industry and... Well industry lobbied the profession and the profession phoned us up and said... This is a disaster. This is... this is a crisis. This is unconstitutional. You know, every word you could describe. This is censorship, this is stupid.
>
> M: Yep
>
> MK: And... But the thing that got us is when somebody said, you know, somebody is going to cure cancer and they're going to say, you know, we discovered a cure for cancer three years ago, but we couldn't tell anybody cause Kopelow wouldn't let us. (Dr. Murray Kopelow, United States).

Such knowledge translation delays may in fact exist in all three countries under study, but during our interviews, only the regulatory policies deemed as *excessive* in the United States were mentioned. We believe that beyond ethics, part of the reason for this finding is related to the American socio-cultural emphasis on entrepreneurialism and a dislike for attempts at thwarting business and impeding the economic "free will."

6.2. CME/CPD content: An increasing focus on quality

Along with the progressive retreat of the pharma industry in CME/CPE, the role of linkage agents (i.e. CME/CPD program designers and providers) was a recurring point of discussion throughout the interviews with participants in all three of the countries under study. As mentioned in the previous chapter, the emphasis of linkage agents is now on providing "quality" CME/CPD and all of what that entails (as opposed to pharma-based, biased

CME/CPD). We saw in our findings that "quality" was defined by participants in terms of usefulness, relevance, timeliness, and accuracy of the content involved:

> M: And when you talk about quality... I know that this has been mentioned a couple of times, but what are... what are some of the elements that you look at? I know you mentioned free of bias and commercial support and you look at the evaluation, or the outline and the overall presentation, but what are some of the actual things that you look at when you want a "quality" presentation?
>
> B: Right. Well, certainly you want to assure that if the topic is being taught that the content is up-to-date, it's accurate, it's covering the... what is accepted standard of care, and... ummm... it is letting the audience know that if they talk about the future that they make sure that the audience understands that maybe it's not current, accepted standard of care, that there is research ongoing in those fields. We also want to look at, like we said, the evaluation at the end of the program. Whether they do a pre-test and post-test, or they just do a post-test. There has to be some way to assure the creditors that people are looking at what the participants have learned out of the program. (Dr. Baretta Casey, United States).

It also meant meeting the needs of physician learners and espousing adult learning theories in the formats and techniques used to deliver the educational content:

> M: OK. So this is a way of... kind of... building on existing data to make programs or activities or different CME opportunities. Now, are there other ways, other techniques that you've been involved in? In developing either needs assessments, programs, or anything like that?
>
> J: For sure. I guess I wasn't really thinking about that. But certainly in terms of developing educational programs, I would say the needs assessment work has become more sophisticated over the years.
>
> M: Mmmhmm. What are some of the changes?
>
> J: We're more systematic about it. And we're more strategic about it. Recently we developed our therapeutics course, we get information about drug prescribing across the province, we get information from pharmaceutical companies about the products, we get input from past teachers and division heads about new directions. And we really look at what we've done before so that the curriculum looks like an on-going curriculum for the doctors.

M: Mmmhmm

J: In other courses we're drawing on clinical practice guidelines and doing more of an environmental scan as well as systematic needs assessments of the doctors. (Jocelyn Lockyer, Canada).

This supports the use of needs assessments as best practice, as we identified with Davis, *et al.* (2008) in our literature review section on CME/CPD Program Planning and the "pull" problem-solving model of knowledge transfer and translation, where knowledge is utilized to reduce a need. This is also in line with Havelock *et al.*'s (1969) view that the users' self-initiation of the need reduction process will result in greater, longer-lasting adoption of the solution. In short, the shift in the content of CME/CPD will undoubtedly bring about lasting practical applications of the knowledge being transferred from the knowledge sources to physician knowledge users.

The next section will look at the various media and technologies used in CME/CPD to further reinforce this new focus on quality and needs. For now, we will highlight the shift in content within CME/CPD, as described by interviewees:

"C: It's really... There's something that... (Laughs) I can't believe that this is a term that is actually used – and you may have heard this – it's... we learn a lot about "butts in seats" CME... you know that's kind of referred to as the old way which was about...

M: About what sorry? The word?

C: They call it "butts in seats" (laughs) ...To get people sitting in your... that you're more counting how many people are sitting in your room...

M: (laughs) Oh right!

C: So, and I mean, that's not a term... I mean everybody uses that. So it's about... how many people are coming to your meeting and that that's really the main focus.

M: Mmmhmm

> C: And now what we're shifting towards is this... are we focused on quality outcomes and how are we ensuring them. So, definitely more of a drive towards adult education concepts, making sure that we're getting... we're presenting information that's relevant, that has meaning and that we're requiring some sort of participation on the part of the learner, not only to try to bring it to a higher level but ummm to ensure that this isn't just kind of an exercise... that they're going through where they're sitting in the back of the class and checking their email... you know... we want to make sure that they're really learning. It's important to healthcare." (Carly Harrington, United States).

Several interviewees mentioned the need to maintain balance within CME/CPD content, avoiding any undue influence from program sponsors or speakers. This tied together both the ethical and the economic contextual dimensions of the knowledge transfer/translation process.

On the ethical side, participants highlighted the need for accurate, relevant knowledge and education to ensure that physicians maintain their professional standards of practice:

> M: OK. And you were saying you look at the quality and the way it is delivered. Do you have specific guidelines that you have to follow for the quality or the content of the...
>
> C: I mean we really try to be practical and useful and we really try to give doctors... I mean, doctors of different specialty areas, what they need at this that time in their career. (Christine Rehwagen, England)

Regarding the economic dimension, participants stressed the issues of potential bias associated to pharmaceutical and other commercial funding of CME/CPD:

> C: So we want to make sure that we provide opportunities for physicians to learn about those things but that they're learning about them with the balanced view of risks and benefits and not they're learning to administer something that hasn't been... that's not generally customarily accepted. (Carly Harrington, United States).

Also, as we have mentioned, the various accrediting bodies in each of the countries under study have set policies and regulatory guidelines dictating what they can and cannot approve in terms of content and structure. These eligibility requirements are used to review each potential CME/CPD provider to ensure that they meet the standards of content, again improving the nature of the content and the overall knowledge transfer and translation process in CME/CPD>

6.2.1. CME/CPD content – Contextual differences

Although participants from each of the countries under study stressed the importance of quality, relevant, up-to-date, and accurate content, one main difference was highlighted in terms of actual trends. In the United States, for instance, participants mentioned the focus on performance improvement and quality improvement CME/CPD, stating that the United States is ahead of both Canada and England with regards to these areas. This exemplifies the American regulatory context focusing on physician performance. Of particular note were the "pay-for-performance" initiatives in the United States, mentioned by Dr. Bernard Marlow (Canada), in which physicians are rewarded for meeting specific quality standards and reducing unnecessary health care costs. This highlights the economic context particular to the US, where physicians are incentivized to provide quality care. On the other hand, participants mentioned the increasing focus on adult learning principles within CME/CPD activities in Canada. This can be explained by the fact that much of the research and publications on CME/CPD have come out of Canada in recent years, as was mentioned by Dr. Dave Davis (United States):

> M: I've spoken to quite a number of people and a lot of people have said Canada has been kind of leading the way on certain aspects of CME whereas the US has led the way on others, such as, financial disclosure, conflicts of interest, that kind of thing. So I'm wondering if you could tell me which... which aspects have been more... let's say... Who's leading what in CME? Which countries?
>
> D: That's a very interesting question, Mireille. Good for you.

M: (laughs)

D: So in Canada, one of the regulations and accreditations for many, many years... I would think for 20 years, less so today... has been the requirement that continuing education departments in medical schools, the only accredited department, A) are in medical schools – which has driven the field – and B) must have a research component or a scholarly component.

M: Mmmhmm

D: And that's driven research. So, for example, if you look at the Journal of Continuing Education in the Health Professions, which is the standard journal in North America for continuing medical education research

M: Mmmhmm

D: Much of it comes from Canada. I would say... 40% of the research comes from Canada.

M: Right.

D: Whereas in the US, the accreditation requirements shine a very bright light on commercial support. Because it is such a big entity. And so, standards of commercial support are clearly looked at. I mean, really, tactfully looked at. But not research. And so the research enterprise is much less. So that's driven research and development and innovation in Canada forward compared to the US. On the other hand, the technology people, the online learning people, the new technologies, video-conferencing, CD-ROM continuing education, is more developed, more supported in the US. Maybe not research and development, but development in the US much more. Again, that commercial support. (Dave Davis, United States).

6.3. CME/CPD media: Technology and the availability of a growing range of formats

Although in the section above Dave Davis emphasized the advanced nature of technology in the United States, leveraging technology as a CME/CPD medium was mentioned during almost every participant interview, in all three countries under study. Interviewees highlighted the growing use of technology in providing new types of media and new formats of CME/CPD, such as online CME/CPD, live teleconferences and webcasting, as well as the

emerging emphasis on hands-on approaches such as simulation. The aim of these new formats is to increase the accessibility of CME/CPD, making it available *anytime* and *anywhere* instead of limiting physicians to one-off regional events:

> T: Technology obviously has come to the table as well – so growth in the use of web, in DVD and interactive asynchronous education as well. (Dr. Todd Dorman, United States).

Several issues were discussed in conjunction with the use of technology. For one, participants highlighted the shift away from the "old style" of CME/CPD – dubbed as "bum-in-seats CME," where counting the presence of participants was the main focus, rather than finding out whether these participants had learned anything that matched their learning needs. This "old style" of CME/CPD was passive CME, often characterized by didactic lectures, whereas the availability of new formats and new technology now makes CME/CPD more active and interactive:

> "You know, that learning is a social process. So it's good to be with your colleagues and sort of find out what they're doing and sort of review what you're doing or what you think you're doing in relationship to what experts are suggesting you should do. Some people describe group learning as a mental health break from practice, which I thought was quite interesting... The ability to step outside practice for a while and start reflecting on how you're doing and what you know." (Dr. Craig Campbell, Canada).

Indeed, interview participants stressed the increasing interactivity of CME/CPD due to technology. An example of this is the use of electronic audience response systems, where participants select answers to questions, such as in television game shows. This is a way of both engaging and increasing audience participation, as well as a tangible system for the speaker/lecturer to gain immediate feedback on the knowledge base of participants, thus helping to tailor CME/CPD to specific audience needs:

> "They started breaking out... our sessions... into learning categories. So some are didactic, some are very interactive with discussions and questions and answers... They have procedurals that are hands-on, where you actually, you

> know, work with it... They utilize audience response systems, electronic response systems a lot... to have the audience participating kind of all the way through. Which helps to assess, you know, gaps in knowledge and performance as you go..." (Carly Harrington, United States).

Matching the needs and learning objectives of physician learners is also one of the main goals of modern-day CME/CPD, and the new technologies and new learning modalities available to physicians reflect this trend. As highlighted by participants, multi-modal learning, where physicians engage in a wide variety of CME/CPD is the new norm. Accrediting bodies are now not only recognizing more and more types of CME/CPD, but they are also demanding that physicians gain their CME/CPD credits from more than one type of activity. Indeed, they offer limited amounts of credits for certain modalities, thus encouraging physician learners to diversify their professional development experience:

> MK: And an accredited provider needs to say... Well why is that? Is it that they don't know about family violence? About what it looks like? And how common it is? And where it occurs? Or do they not know to ask about it? These are two different things. If they don't know, they don't know... Or they think they know and they don't. And that's the knowledge thing that you have to monitor. But if they do know about family violence but they just don't know the question to ask a person to find out if it's occurring, that's a different educational thing. So that's C2. C3 is design your activity to change something. So you identify that they don't have a strategy for asking questions. So that means that the educational activities that you ask—that you design—need to be designed to actual get people to be able to ask questions. So you have to show them different questions, they have to hear different questions, they have to practice different questions, they have to use simulated patients to do it, you have to watch to see... you have to ask them... so how many times did you do this in the last month...
>
> MK: And that's the right activity for what it is that you are trying to accomplish. And Criteria 4, 5, and 6 talk about using the right formats and basing it on the kinds of competencies that our people are trying to... umm... address in the United States. And that we should always make sure that what they're getting matches their scope of practice.
>
> M: Mmmhmm

> MK: That the people that are in the room should be getting education that matches what they do in practice.
>
> M: Yep
>
> MK: So it's a very... the right thing at the right time for the right person. If you're doing it individualized, it's easy as you... as you... educated for larger and larger groups, it becomes more and more of a challenge to give them what they really need. You get more and more people in the room where it's not exactly the perfect activity. Um, so it's... it's not so much the format... that there are formats that matter... that there are the right formats. It's that there is the right thing to do for what it is you're trying to accomplish. (Dr. Murray Kopelow, United States).

All of these changes regarding new technology and new formats used in CME/CPD relate directly to several contextual elements. Of note are the economic and socio-cultural dimensions surrounding the CME/CPD knowledge transfer/translation process. Indeed, as more and more types of learning modalities become available, physicians can overcome temporal, geographic and financial constraints associated with travelling to and from, and paying for CME/CPD events. Economically, the wide range of CME/CPD activities offer more online and other self-learning possibilities, allowing physicians to circumvent budgetary cuts and other austerity measures linked to healthcare since they (or their employers) do not necessarily have to pay travel fees or find other resources to replace them while they are out of the office. As such, this availability of several modes of learning and professional development reflects the socio-cultural realities physicians operate in.

6.3.1. Technology and formats – Contextual differences

While participants in each of the countries under study stressed the importance of new technology in providing multiple types of learning and professional development modalities, several contextual differences surfaced during the interviews. For instance, Dr. Baretta Casey highlighted the particular needs of doctors in rural practices the United States. Because of the size of the country, rural physicians in the United States, like those in Canada,

must contend with the cost issues of sending physicians to large conferences in distant cities. These costs involve more than just travel expenses, but also finding replacements to care for patients during their absence. In short, online and other new CME/CPD formats save physicians time and money.

England is a smaller country, with shorter distances to major CME/CPD centres like London, but the issue of travelling was also brought up by English interviewees. Indeed, participants mentioned the importance of saving time and money by using new formats of CME/CPD within the English healthcare system. As participants said, the time constraints placed on doctors with the European Union Working Time Directive means that doctors have less time in which to accomplish their work, let alone complete CME/CPD hours. Furthermore, austerity measures and cuts within the NHS have meant that budgets for work study leave have been cut and the amount of money available for physicians' CME/CPD is much less than it was before. The new technologies used in CME/CPD help physicians meet their learning needs by fitting within their schedules as and when they are available without needing study leave.

In summary, economic, socio-cultural and healthcare system related issues conjointly affect the CME/CPD knowledge transfer/translation process. Multiple types of learning formats have been designed to fit within the schedules, budgets and geographical constraints of physicians. Technology is thus a key factor in facilitating the transfer and translation of knowledge in CME/CPD.

6.4. Knowledge Users: Physicians as knowledge workers

Overall, discussions with interviewees revealed the responsibilities of physicians in their roles as knowledge workers. Dealing with knowledge on a daily basis, keeping up-to-date and informed about this knowledge, and ensuring that their practice reflects the latest, most appropriate and supported evidence-based knowledge and guidelines are some of the

duties of physician knowledge workers, as described by interview participants. CME/CPD was one of the tools mentioned as helping physicians uphold these duties:

> C: I think what's driven the change has been more from the CME profession itself working with CPD organizations and national Colleges, like the Royal College. I think this has been more about a culture shift than it has been anything else in CPD. And it's really about a new expectation for the profession around accountability and transparency of how we are managing as a self-regulating profession, the competencies that we profess to hold. And it's part... I think it's been more the profession holding the profession accountable for this. (Dr. Craig Campbell, Canada).

The ethical aspect was mentioned by interview participants on several occasions, using words such as, "responsibility," "accountability," "professionalism," "duty" and an overall discussion of the moral and ethical obligations of physicians. Interviewees mentioned that through these duties, physicians have responsibilities towards their patients, the wider population, the healthcare system as a whole, and their profession. These were consistent with the levels of effectiveness and outcomes of CME/CPD identified by Kirkpatrick (1994), Miller (1990), and Moore (2007), as discussed in our Review of the Literature. Interviewees stressed the importance of outcomes at the "higher" levels – influence on patient health and societal health.

6.4.1. Physicians as knowledge workers – Contextual differences

Although participants in all three countries brought up these issues of responsibility and accountability, it was clear from discussions that country-specific issues brought about variations in the reasons for focusing on elements of professionalism. Interviews regarding the U.S. context related professionalism and accountability to political and regulatory pressures regarding the need for transparency and disclosure of financial interests, as well as the ethical dimension regarding the separation of industry (pharmaceutical and other commercial entities) and promotion/marketing from medical education. This relates directly

to the entrepreneurial, business-like context of healthcare in the United States, where doctors, CME/CPD providers and other stakeholders can stand to make profit within this privately-funded industry.

As regards England, interviewees also mentioned ethical, political and regulatory pressures for the maintenance of professionalism. However, the motivations for these political and regulatory pressures stemmed from very different origins to those of the United States. Whereas undue influence from financial support, and balancing the profit-making, competitive side of healthcare were the impetuses for regulation and political lobbying in the United States, participants stated that England was more concerned with mending the tarnished image of the medical profession after the Harold Shipman incident, and keeping such episodes of grave misconduct from ever occurring again:

> "And actually we always talk about the UK and I always say that the stimulus for a lot of the change in the UK was from a mass murderer, you know, and in part that's what stimulated the public's interest and the physicians lost their ability to self-regulate..." (Dr. Bernard Marlow, Canada).

Discussions of professionalism and accountability in relation to the Canadian context alluded to the "spill over" of regulations and policies from the United States into Canada (as is the case in many other aspects of society for these bordering neighbours). Furthermore, according to interviewees, the motivations for accountability related more to the overall social purpose of the publicly-funded Medicare healthcare system – that healthcare be a given right to each and every Canadian citizen.

In short, the main contextual elements mentioned by interview participants in each of the countries under study with regards to physicians as knowledge workers were the economic, political, regulatory, ethical, and social dimensions. As interviewees mentioned, these elements have impacted the CME/CPD process in a number of ways and have brought about massive changes in the CME/CPD landscape in the last two decades. The main changes and impacts mentioned in discussions on this topic highlighted the progressive retraction of

pharmaceutical and other commercial funding from the CME/CPD field, the appearance of regulatory policies and codes of ethics and conduct regarding the involvement of commercial entities in continuing education, as well as the overall trend towards greater transparency. We have highlighted the contrasts apparent in the origins of these changes in each of the countries under study. These include the increased focus on commercial and economic issues in the United States, the political and regulatory pressures in the United States and England, and the implications of the social healthcare aspect in the Canadian context. Despite these variations, all three countries stressed the importance of the ethical dimension of professional and social accountability.

6.5. Overview of the influence of contextual elements

Overall, we have described how the knowledge transfer/translation process is affected by various contextual elements – from regulations, economic conditions, funding issues, and political lobbying to social, cultural and ethical concerns. Each of these dimensions affects Canada, the United States and England to varying degrees and in different ways. Although there are similarities between the countries, such as a focus on quality and the withdrawal of pharmaceutical companies, the CME/CPD knowledge transfer/translation process remains very diverse. It is impacted both by local contextual elements as well as by the overall "trends" specific the CME/CPD industry, trends which find their way across borders as CME/CPD stakeholders learn and share business practices amongst each other.

Several CME/CPD stakeholder meetings were mentioned by interview participants, illustrating how knowledge is transferred within the entire CME/CPD system. Dr. Bernard Marlow (Canada) described the situation in his interview:

> "There are many different tables where people gather. There's what's called the ROME group, and Ian (Starke) is part of that group. He represents the UK... Where accreditors from around the world meet and discuss the common issues in Rome every year. There's the CACME, which is the Canadian Council on

> Accreditation of CME if another forum – both the Royal College an the CFPC work very closely together and we sit on each others' professional development committee. Some are working groups. And so we compare notes at those venues as well. And both of us are part of the sub-committee on CPD, which is the committee of the University Associate Deans, where we discuss these issues and we have an accreditation conference once a year." (Dr. Bernard Marlow, Canada.)

However, as we portrayed in the previous chapter in the presentation of our results, CME/CPD has become a "business." As such, despite the emphasis on solidarity and camaraderie amongst stakeholders, an element of competition still exists. CME/CPD providers can only survive as long as their programs and activities are profit-making or at least self-sustaining. Because of this, CME/CPD providers keep their proprietary ideas to themselves, often delaying the transfer of best practices and impeding the spread of quality CME/CPD amongst providers. Dr. Jocelyn Lockyer (Canada) highlighted this issue during her interview:

> "Everybody's trying to do their own thing across Canada. We don't share our end products terribly well." (Dr. Jocelyn Lockyer, Canada.)

We have also illustrated the intertwined and interdependent nature of all of the contextual elements involved in the CME/CPD knowledge transfer/translation process. Regulatory issues (such as Guidelines for interaction with industry) are related to economic conditions (such as pharmaceutical funding), which in turn highlight ethical dimensions (such as conflicts of interest and undue bias), which relate back to the socio-cultural context of how such interactions are viewed.

6.6. Answering the research question

After having presented and discussed our research findings in detail, we can now answer the main research question of this thesis:

How do contextual elements influence the CME/CPD knowledge transfer/translation process and stakeholders, and how do these influences compare in Canada, the United States and England?

The answer is clear: contextual elements (the economic, political, regulatory, socio-cultural, technological and ethical dimensions) act as either barriers or facilitators to the knowledge transfer/translation process. They can also act as both barriers AND facilitators to the process, simultaneously. The next section elaborates on this answer to our research question.

6.7. Discussion: Barriers and facilitators to the knowledge transfer/translation CME/CPD process

As per our research findings, each of the contextual dimensions used for this study can be seen as a barrier and/or a facilitator to the knowledge transfer/translation process. The economic dimension involves both the overall country's economy and specific budgets and incentives available to physicians for their CME/CPD. For linkage agents, the costs of creating, designing and providing CME/CPD can be high, forcing these providers to increase the prices for knowledge users. High costs impede the knowledge transfer/translation process. This barrier is circumvented with external funding from commercial companies or governments. These entities provide low-cost CME/CPD to physicians. However, as we have highlighted, the potential for bias and undue influence from these sources of funding is possible. As such, in this case, the economic context becomes a facilitator in the knowledge transfer/translation process, helping physicians gain access to CME/CPD by reducing costs. But it is simultaneously a barrier because unbalanced, biased CME/CPD impedes the transfer of quality CME/CPD.

The regulatory dimension is related to policies, guidelines and laws that directly affect CME/CPD. Certain guidelines directly increase the flow of knowledge within the CME/CPD knowledge transfer/translation process. One such example is the use of evaluation

guidelines by accrediting bodies. Such guidelines help to increase the content, structure and quality of CME/CPD programs and activities. Other guidelines such as those dictating appropriate and inappropriate interactions with commercial sponsors also help to facilitate and improve the CME/CPD knowledge transfer/translation process. However, as we have seen in our findings and earlier discussions, some guidelines, while intended to improve the flow of knowledge, may actually impede the proper transfer and translation of knowledge. This was the case of the AACME's overly restrictive guideline regarding the diffusion of knowledge based on the discovery phase of commercial companies' clinical trials.

Political lobbying and other pressures also act as both barriers and facilitators to the knowledge transfer/translation process. When government officials, such as Senator Grassley in the United States, shine a light of issues within the CME/CPD knowledge transfer/translation system, public interest is increased and change occurs, thus improving the transfer process. In England, this was seen with the government's reaction to the Harold Shipman inquiry. The increased focus on quality, performance and professionalism eventually brought about the first steps toward the introduction of mandatory revalidation within that country. Mandatory revalidation (like other obligatory rules and policies) ensure a certain amount of respect for professional standards of practice and care, including keeping up-to-date with clinical and other professional knowledge, thus guaranteeing better participation in the CME/CPD knowledge transfer/translation process. At the same time, certain interviewees had highlighted the reluctance of some physicians to "be told what to do" when CME/CPD is already an imperative for physicians concerned with maintaining their accountability and professional standards. This takes away some of the willingness and genuine interest of physicians regarding CME/CPD participation.

Ethical and socio-cultural issues act as facilitators to the knowledge transfer/translation process by setting the stage for intangible moral and social imperatives for behaviour that might be seen as "professional." Participation in CME/CPD activities in one such behaviour. Tangible codes of conduct and ethics also directly improve the knowledge transfer/translation process. However, if concerns for professionalism and accountability

are not expressly ingrained in social and ethical contexts, the importance of CME/CPD is not as great for physicians, thus acting as a barrier to this process.

Technology, as we have seen, is one of the greatest facilitators of the knowledge transfer/translation process. Distance learning solutions, videoconferencing and other formats based on new and improving technologies, allow access to CME/CPD for even the most remote, rural physicians. Furthermore, technology can counteract the financial and temporal issues related to travelling to and from CME/CPD events. Lastly, as we found in our interviews, technology improves the CME/CPD experience by creating more interactive learning environments with tools such as the audience response systems. However, technology can also be seen as a barrier to knowledge transfer/translation. Physicians must be able to actually *use* technology. If they are unfamiliar with online learning or don't have access to the internet (which is becoming less of an issue), then certain CME/CPD formats are limited to them and technology actually impedes the knowledge transfer/translation process.

As such, each of the contextual elements described above can act both as a barrier and a facilitator to the CME/CPD knowledge transfer/translation process. Country-specific contextual issues, especially those related to culture, affect whether CME/CPD will be viewed as important within a given society. We have observed that this was the case with all three countries under study for this thesis. The overall move towards great transparency and quality within the entire CME/CPD knowledge transfer/translation process was evident.

CONCLUSION

In this study, we have portrayed a comparative view of the CME/CPD knowledge transfer/translation process in Canada, the United States and England, highlighting how contextual elements facilitate and/or impede this process. Through our Review of the Literature, we discussed the theories and prior research at the basis of modern-day conceptions of knowledge, knowledge society and knowledge workers, as well as knowledge transfer, continuing medical education and continuing professional development.

Next, we provided a Conceptual Framework based on these theories and research, helping to structure the rest of this study. We further described the particular research contexts of Canada, the United States and England. We presented our research methodology: a series of in-depth semi-structured one-on-one interviews followed by a content analysis. We presented our findings in five categories: CME/CPD as a field and profession; the "business" of CME/CPD; the new focus of CME/CPD; the new formats used in CME/CPD, the impact of contextual elements on the CME/CPD process.

We then analyzed and discussed these findings in terms of the four categories at the basis of all knowledge transfer/translation processes: *source*, *content*, *medium*, and *user*, stating which particular contextual elements were associated to each category in each country. We found that the economic, political, ethical, regulatory, socio-cultural and technological contextual environments all overlapped and were interconnected amongst and between the countries under study.

In terms of *knowledge sources*, the ethical and regulatory dimensions were especially influential in all three countries, but particularly in the United States because of the specific entrepreneurial/business-focused perspective in that country. The CME/CPD *content* and the increasing focus on quality CME/CPD was related to the economic, ethical and regulatory dimensions in all three countries under study. Technological, economic, and socio-cultural factors directly affected the CME/CPD media and formats available in all three

countries equally. Ethical, regulatory and political aspects were the important dimensions regarding the knowledge *user* category, with an emphasis on regulatory issues in the United States and political pressure in England. Overall, these dimensions acted as barriers and/or facilitators to the CME/CPD knowledge transfer/translation process. We discussed how these dimensions can be both barriers AND facilitators simultaneously. The economic, ethical and regulatory dimensions were particularly influential as barriers and facilitators of the knowledge transfer/translation process.

In short, this study has highlighted the impact of contextual elements on the knowledge transfer/translation process. Through our findings, we believe that contextual elements should be used in an integrative framework in the development of an overarching knowledge transfer/translation theory within the CME/CPD perspective.

Until now, such a theory has not existed due to the multiple fields and lack of consensus of terminology involved in this process. Highlighting the particular influences of contextual elements on the CME/CPD knowledge transfer/translation process in particular countries helps to situate the process within the wider healthcare and societal perspective. Taking note of these context- and country-specific particularities could facilitate the involvement of global knowledge transfer/translation stakeholders.

For instance, in being more aware of specific contextual constraints placed on their targeted audience, knowledge sources could overcome the *two-communities* issue and adapt their research findings to end users. Linkage agents (in the form of CME/CPD providers) would gain a better understanding of how to design and tailor their activities and programs to these contextual constraints. This could include increasing the availability of certain CME/CPD formats using new technologies in certain areas or countries.

Limitations

The qualitative research for this study was conducted within a constructivist perspective, basing itself on theories of knowledge transfer and translation, continuing medical education, continuing professional development and adult learning. Although precautions to ensure the validity and reliability were taken (as per Pope & Mays, 1995), this study is still limited in its scope and applicability to other contexts.

Purposive and snowball sampling were used for the convenience of time, but have excluded important CME/CPD actors, which would have added to the richness of the analysis in this study. For instance, interviewing pharmaceutical companies and physicians not directly involved in the knowledge transfer/translation process would have yielded some differing views from those of the chosen interview participants. Due to temporal and financial constraints, only 16 interviews were conducted in total, and only half took place face-to-face. A greater variety of interviews would have yielded a wider range of findings and in-person interviews would have allowed the researcher to pick up on non-verbal cues, aiding in the interview process. Finally, the coding and interpretation of the interview transcripts was conducted by one sole researcher. Member checking with interview participants and/or involving independent assessors regarding the codes, themes, and findings would have improved the reliability and validity of the analysis of this study's qualitative data.

Research Perspectives

Future research on the impact of contextual elements on the CME/CPD knowledge transfer/translation process should aim to widen the types of stakeholders interviewed, in order to include all of those listed in this study's Conceptual Framework. Furthermore, future research should expand the countries and contexts under study. For instance, an interesting perspective would be to look at the impact of contextual elements on knowledge

transfer/translation in developing countries. Future research could also focus on one particular contextual element, such as the ethical dimension, comparing its impact on several different countries. Another research perspective would be to conduct longitudinal studies to reflect changes within the contextual environments. In short, this thesis has opened the door for many possibilities of research perspectives.

REFERENCES

Alavi, M. and Leidner, D. (1999). "Knowledge Management Systems: Emerging Views and Practices from the Field." Proceedings of the 32nd Hawaii International Conference on System Sciences.

Alavi, M. and Leidner, D. (2001). 'Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues.' *MIS Quarterly*. 25(1):107–136.

American Accreditation Council for Continuing Medical Education (2011). 'About.' http://www.accme.org/index.cfm/fa/about.home/About.cfm. Accessed August 2011.

American Medial Association. (2011). 'Physician's Recognition Award and Credit System.' http://www.ama-assn.org/ama/pub/education-careers/continuing-medical-education/physicians-recognition-award-credit-system.page?. Accessed July 2011.

Amidon, D. (1997). *Innovation Strategy for the Knowledge Economy: The Keen Awakening*. Boston, MA: Butterworth-Heinemann.

Anderson, B.L. (1992). 'Successful Curriculum Reforms: Sharing the Knowledge with Policymakers and Practitioners in Ways That Influence Practice.' Colorado University., Boulder: 21.

Argyris, C. and Schön, D. (1978). *Organizational Learning: A Theory of Action Perspective.* Reading, Massachusetts: Addison-Wesley.

Azzaretto, J.F. (1990). 'Power, Responsibility, and Accountability in Continuing Professional Education,' in R.M. Cervero and J.F. Azzaretto (eds.), *Visions for the Future of Continuing Professional Education*. Athens, Georgia: Department of Adult Education, University of Georgia.

Becker, M.H. (1970). 'Factors Affecting the Diffusion of Innovation among Health Professionals.' *American Journal of Public Health*. 60, p. 294–304.

Bédard, M.G., Ebrahimi, M., Saives A.-L. (2011). *Le management à l'ère de la société du savoir*. Montreal : Chenelière.

Beesley, L. and Cooper, C. (2008). 'Defining knowledge management (KM) activities: towards consensus.' *Journal of Knowledge Management*. Vol. 12 Iss: 3, p.48 - 62

Bohn, R.E and J.E. Short (2009). 'How Much Information? 2009 Report on American Consumers.' http://hmi.ucsd.edu/pdf/HMI_2009_ConsumerReport_Dec9_2009.pdf. Accessed July 2010.

Brauner, E. and Becker, A. (2006). 'Beyond knowledge sharing: the management of transactive knowledge systems.' *Knowledge and Process Management*. Vol. 13 No. 1, p. 62-71.

Canada's Economic Action Plan. (2011). 'A Seventh Report to Canadians - Chapter 2 Progress Achieved to Date - Advancing Canada's Knowledge Economy and Creating Better Jobs.' http://www.actionplan.gc.ca/eng/feature.asp?pageId=220 Accessed July 2011.

Canadian Health Services Research Foundation. (2003). 'Knowledge brokering in Canada's health system: what we're doing, what we're reading.' Ottawa, Ontario, Canada, Canadian Health Services Research Foundation.

Caplan, N. (1979). 'The Two-Communities Theory and Knowledge Utilization.' *American Behavioral Scientist*. Vol 22, No 3, January-February, p. 459-470.

Caron, P., Beaudoin, G., Leblanc, F. & Grant, A. (2007). 'Architecture for Implementation of a Lifelong Online Learning Environment (LOLE).' *International Journal on E-Learning*. 6(3), p. 313-332.

Cervero, R.M. (2000). 'Trends and Issues in Continuing Professional Education', in V Mott and B Daley (eds), *Charting a Course for Continuing Professional Education: Reframing Professional Practice: New Directions for Adult and Continuing Education, No. 86,* San Francisco : Jossey-Bass.

Cervero, R.M. (2001). 'Continuing professional education in transition, 1981–2000.' *Int. J. of Lifelong Education*. 20(1/2), 16-30.

CFPC (College of Family Physicians of Canada). (2008). '...And Still Waiting - Exploring Primary Care Wait Times in Canada.' http://www.cfpc.ca/uploadedFiles/Resources/Resource_Items/PCWTP%20Discussion%20Paper%20v3.pdf. Accessed August 2011.

CFPC. (2011a). 'Reporting your Mainpro Credits.' http://www.cfpc.ca/ReportCredits/ Accessed June 2011.

CFPC. (2011b). 'A Guide to Mainpro Accreditation.' http://www.cfpc.ca/CPDProvidersandPlanners/ Accessed June 2011.

CFPC. (2011c). 'Ethical Review and Guidelines.' http://www.cfpc.ca/projectassets/templates/column1b.aspx?id=935&langType=4105. Accessed July 2011.

CFPC. (2011d). 'Ethics.' http://www.cfpc.ca/Ethics/. Accessed August 2011.

Chase, R. (2006). "A decade of knowledge management", *Journal of Knowledge Management*, 10(1).

Chassin MR, Galvin RW. (1998). 'The urgent need to improve health care quality.' Institute of Medicine National Roundtable on Health Care Quality. *JAMA*. 280, p. 1000–5.

CIHI (Canadian Institute for Health Information. (2010). National Health Expenditure Trends, 1975 to 2010. http://secure.cihi.ca/cihiweb/products/NHEX_Trends_Report_2010_final_ENG_web.pdf Accessed July 2011.

CIHR (Canadian Institutes of Health Research). (2007). 'Knowledge Translation at the Canadian Institutes of Health Research: A Primer.' FOCUS TECHNICAL BRIEF NO. 18. http://www.ncddr.org/kt/products/focus/focus18/. Accessed July 2011.

CIHR. (2010). 'CIHR Three-Year Implementation Plan and Progress Report 2010–13 - Health Research Roadmap: Creating innovative research for better health and health care. http://www.cihr-irsc.gc.ca/e/documents/cihr_impl_plan_e.pdf Accessed July 2011.

CIHR. (2011). 'CIHR Institutes.' http://www.cihr-irsc.gc.ca/e/9466.html Accessed July 2011.

Clancy C, and Cronin K. (2005). 'Evidence based decision making: Global evidence, local decisions.' *Health Affairs.* 24(1), p. 151-162.

CMA (Canadian Medical Association). (2005). 'CMA Policy – Medical Professionalism.' http://policybase.cma.ca/dbtw-wpd/Policypdf/PD06-02.pdf Accessed July 2011.

CMA. (2007). 'Guidelines for Physician Interactions with Industry.' http://policybase.cma.ca/dbtw-wpd/Policypdf/PD08-01.pdf Accessed August 2011.

CMA. (2009). 'Analysis of factors affecting physicians' delivery of care: Demands, impediments and issues of access.' http://www.cma.ca/multimedia/CMA/Content_Images/Policy_Advocacy/Policy_Research/5_FinalBarriers_E.pdf Accessed August 2011.

CMA. (2011). 'Medical Professionalism.' http://www.cma.ca/index.php/ci_id/3300/la_id/1.htm. Accessed August 2011.

CMA Masterfile. (2011). 'Number of Physicians by Province/Territory and Specialty, Canada, 2011.' http://www.cma.ca/multimedia/CMA/Content_Images/Inside_cma/Statistics/01SpecProv.pdf. Accessed July 2011.

CMA Masterfile. (2009). 'Physicians per 100,000 population by Province/Territory, 1986-2009.' http://www.cma.ca/multimedia/CMA/Content_Images/Inside_cma/Statistics/12-Phys_per_pop.pdf Accessed July 2011.

CMQ (Collège des médecins du Québec). (2011). 'Continuing Professional Development – A responsibility, a requirement, and the tools.' http://www.cmq.org/en/MedecinsMembres/Dpc.aspx. Accessed July 2011.

Cochrane LJ, Olson CA, Murray S, Dupuis M, Tooman T and Hayes S. (2007). 'Gaps between knowing and doing: understanding and assessing the barriers to optimal health care.' *J Contin Educ Health Prof.* Spring; 27(2), p. 94-102.

Cole, R. E. (1998). 'Introduction', *California Management Review* 45(3), p. 15-21.

CEMCQ (Conseil de l'éducation médicale continue du Québec. (2003). 'Code of Ethics for parties involved in Continuing Medical Education.' http://www.cemcq.qc.ca/en/documents/guide_ethique.pdf. Accessed August 2011.

CPSNL (College of Physicians and Surgeons of Newfoundland and Labrador). (2010). 'Quality Assurance.' http://www.cpsnl.ca/default.asp?com=Pages&id=4&m=59 Accessed August 2011.

Davenport, T.H. (2005). *Thinking for a Living: How to Get Better Performance and Results from Knowledge Workers*. Boston, MA: Harvard Business School Press.

Davenport, T.H., and Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Cambridge, MA: Harvard Business School Press.

Davis D, O'Brien MA, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. (1999). 'Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes?' *JAMA.* 282, p. 867-74.

Davis, D., Barnes, BE, Fox, R. (2003). *The Continuing Professional Development of Physicians, From Research to Pratice.* AMA Press, p. 151.

Davis, D., Evans, M., Jadad, A. *et al.* (2003). 'The case of knowledge translation: shortening the journey from evidence to effect.' *BMJ.* 327, p. 33-5.

Davis, D. (2004). 'CME and the pharmaceutical industry: two worlds, three views, four steps.' *CMAJ.* 171(2), p. 149-50.

Davis N, Davis D, Bloch R. (2008). 'Continuing medical education: AMEE Education Guide No 35.' *Med Teach.* 30(7), p. 652-66.

Department of Finance Canada. (2010). 'Canada Health Transfer.' http://www.fin.gc.ca/fedprov/cht-eng.asp. Accessed July 2011.

Department of Health England. (2011). 'NHS – Department of Health'. http://www.dh.gov.uk/health/category/policy-areas/nhs/ Accessed August 2011.

Department of Justice Canada. (2011). 'Canada Health Act (R.S.C., 1985, c. C-6).' http://laws-lois.justice.gc.ca/eng/acts/C-6/ Accessed July 2011.

DiCicco-Bloom, B. and Crabtree, B. (2006). 'The Qualitative Research Interview.' *Medical Education.* 40 (4), p. 314–321.

Dretske, F. (1981). *Knowledge and the Flow of Information.* Cambridge, MA: MIT Press.

Drucker, P.F. (1991). "The new productivity challenge." *Harvard Business Review.* 69(6), p. 69-76.

Drucker, P.F. (1993). *Post-capitalist Society.* Oxford: Butterworth-Heinmann.

Drucker, P.F. (1994). 'The Age of Social Transformation'. *The Atlantic Monthly.* 274(5), p. 53-71.

Drucker, P.F. (2001). 'The Next Workforce'. *The Economist.* 361(8246), p. 8-11.

Dryer, B.V. (1962). 'Lifetime learning for physicians'. *JAMA.* 180(8), p. 676-9.

Earl, M. (2001). 'Knowledge management strategies: toward a taxonomy.' *Journal of Management Information Systems.* 18(1), p. 215–233.

Eddy, D.M. (2005). 'Evidence-based medicine: a unified approach.' *Health Aff* (Millwood). Jan-Feb; 24(1), p. 9-17.

Elo, S. and Kyngäs, H. (2008). 'The qualitative content analysis process.' *Journal of advanced nursing*. 62 (1), p. 107-15.

Epstein RM, Hundert EM. (2002). 'Defining and assessing professional competence.' *JAMA*. 287(2), p. 226-35.

Federation of National Specialty Societies of Canada (FNSSC). (2009). 'Guide to Continuing Professional Learning For Specialists in Canada.' http://fnssc.ca/resources/FNSSC_CPD_Guide.pdf Accessed July 2011.

Fixsen, D.L., Naoom, S.F., Blase, K.A., Friedman, R.M., & Wallace, F. (2005). 'Implementation research: A synthesis of the literature.' Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network.

FMOQ (Fédération des médecins omnipraticiens du Québec). (2011). Professional Development – Training Activities. http://www.fmoq.org/en/training/activities/convention.aspx. Accessed July 2011.

FMRAC (Federation of Medical Regulatory Authorities of Canada). (2007). 'Position Paper – Physician Revalidation – Maintaining Competence and Performance.' FMRAC Revalidation Working Group. http://www.fmrac.ca/committees/documents/final_reval_position_eng.pdf Accessed July 2011.

FNSSC (Federation of National Specialty Societies of Canada). (2008). 'Peer-Reviewed Journals.' http://fnssc.ca/publications_journals/index_e.html. Accessed July 2011.

Foray, D. (2000). *L'économie de la connaissance*. Paris: La Découverte.

Foray, D. and B.-A. Lundvall. (1996). 'The Knowledge-Based Economy: From the Economics of Knowledge to the Learning Economy,' in *OECD, Employment and Growth in the Knowledge-Based Economy*. Paris: OECD, p. 11–32.

Fosnot, C.E. (2005). *Constructivism: Theory, perspectives, and practice* (2nd ed.). New York: Teachers College Press, Columbia University.

Fosnot, C.E. & Perry, R.S. (2005). 'Constructivism: A psychological theory of learning.' In C.E. Fosnot (Ed.) *Constructivism: Theory, perspectives, and practice* (2nd ed.). New York: Teachers College Press, Columbia University.

Frank JR, Jabbour M, Tugwell P, *et al.* (1996). 'Skills for the new millennium: report of the societal needs working group, CanMEDS 2000 Project.' *Annals Royal College of Physicians and Surgeons of Canada*. 29, p. 206-16.

Gagliardi AR, Légaré F, Brouwers MC, Webster F, Wiljer D, Badley E, Straus S. (2011). 'Protocol: developing a conceptual framework of patient mediated knowledge translation, systematic review using a realist approach.' *Implement Sci.* Mar 22;6(1), p. 25.

Geertz, C. (1973). *The Interpretation of Cultures*. New York: Basic Books.

General Medical Council (2009). 'More than 218,000 doctors now have a Licence to Practise.' http://www.gmc-uk.org/news/4980.asp Accessed August 2011.

Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N. (2006). 'Lost in Knowledge Translation: Time for a Map?' *The Journal of Continuing Education in the Health Professions*, 26(1), p. 13–24.

Grant, R. M. (1996a). 'Prospering in Dynamically-Competitive Environments: Organizational Capability as Knowledge Integration.' *Organization Science.* (7:4), July-August, p. 375-87.

Grant, R. M. (1996b). 'Toward a Knowledge-based Theory of the Firm.' *Strategic Management Journal.* (17), Winter Special Issue, p. 109-22.

Green LW, Ottoson JM, Garcia C, and Hiatt RA. (2009). 'Diffusion Theory and Knowledge Dissemination, Utilization, and Integration in Public Health.' *Annu Rev Public Health*. 30, p. 151-174.

Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. (2004). 'Diffusion of innovations in service organizations: systematic review and recommendations.' *Milbank Q.* 82, p. 581-629.

Grimshaw J, Eccles M, Tetroe J. (2004). 'Implementing clinical practice guidelines: Current evidence and future implications.' *J Cont Educ Health Prof.* 24, p.S31–S37.

Grimshaw, J.M., J. Ward, and M. Eccles. (2001). 'Getting Research into Practice.' In *The Oxford Handbook of Public Health Practice*, edited by D. Pencheon, J.A.M. Gray, C. Guest, and D. Melzer. Oxford: Oxford University Press, p. 480–86.

Grol RP, Grimshaw J. (2003). 'From best evidence to best practice: effective implementation of change in patients' care.' *Lancet.* 362, p. 1225–30.

Havelock, R.G. (1969). *Planning for innovation through dissemination and utilization of knowledge*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.

Health Canada. (2010). 'Canada Health Act Annual Report 2009-2010.' http://www.hc-sc.gc.ca/hcs-sss/pubs/cha-lcs/2010-cha-lcs-ar-ra/index-eng.php Accessed July 2011.

Health Canada. (2011). 'Importance of Science and Research.' http://www.hc-sc.gc.ca/sr-sr/about-apropos/importance/index-eng.php Accessed July 2011.

Hervey, D. (1994). *What is Competence?* Milton Keynes: Vocational Qualifications Centre, Open University.

Hicks, R., Dattero, R. and Galup, S. (2004), 'A value chain perspective of knowledge definitions and transformations' *Proceedings of the Academy of Information and Management Sciences*, 8(2), Maui, p. 29-33.

Hicks, R., Dattero, R. and Galup, S. (2006), 'The five-tier knowledge management hierarchy', *Journal of Knowledge Management*, 10(1), p. 19-31.

Hislop, D. (2003). 'Linking human resource management and knowledge management via commitment: a review and a research agenda.' *Employee Relations*. Vol. 25 No. 2, p. 182-202.

Hlupic V., Pouloudi A. and Rzevski G. (2002). 'Towards an integrated approach to knowledge management: 'hard', 'soft' and 'abstract' issues.' *Knowledge and Process Management*. 9(2), 90–102.

Hobbs JL. (2009). 'A dimensional analysis of patient-centered care.' *Nurs Res*. 58, p. 56–62.

Horsley, T., Grimshaw, J. and Campbell C. (2010). 'Policy Brief: Creating Conditions for Adapting Skills to New Needs & Lifelong Learning.' Investing in Europe's health workforce of tomorrow: Scope for innovation and collaboration. European Observatory on Health Systems and Policies & Health Evidence Network of WHO/Europe. http://www.healthworkforce4europe.eu/downloads/draft_Policy%20Brief_lifelonglearning.pdf Accessed July 2011.

Howitt, P. (1996). 'On some problems in measuring knowledge-based growth', in P Howitt (ed.), *The Implications of Knowledge-Based Growth for Micro-Economic Policies*. Calgary, AB: University of Calgary Press.

Huberman, M. (1990). 'Linkage between practitioners and researchers: qualitative study.' *American Educational Research Journal.* 27, p. 363-91.

Huberman, M. and M. Gather-Thurler (1991). *De la recherche à la pratique - Élements de base.* New York : Peter Lang.

Hutchinson, J.R. (1995). 'A multimethod analysis of knowledge use in social policy: Research use in decisions affecting the welfare of children.' *Science Communication.* September, p. 90-106.

Industry Canada. (2011a). 'Canadian Pharmaceutical Industry Profile.' http://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h_hn00021.html Accessed August 2011.

Industry Canada. (2011b). Canada's Biotechnology Industry. http://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h_hn00079.html Accessed August 2011.

Institute of Medicine. (2001). 'Crossing the Quality Chasm: A New Health System for the 21st Century.' http://www.nap.edu/openbook.php?record_id=10027&page=145 Accessed July 2011.

International Data Corp. (2010). 'The Digital Universe Decade – Are You Ready?'. http://idcdocserv.com/925. Accessed July 2010.

IOM (Institute of Medicine). (2010). *Redesigning Continuing Education in the Health Professions*. Washington, DC: The National Academies Press.

Jackson-Bowers E, Kalucy L, McIntyre E. (2006). 'Focus on knowledge brokering.' *Primary Health Care Research and Information Service.*

Jarvis, P and Griffin, C. (eds.). (2003). *Adult and Continuing Education*: *Major Themes in Education*. 5 vols. New York: Routeledge.

Kirkpatrick, DL. (1994). *Evaluating Training Programs: The Four Levels.* San Francisco: Berrett-Koehler.

Kirst, M. W. (2000). 'Bridging education research and education policymaking.' *Oxford Review of Education.* 26(3/4), p. 379-391.

Knowles, M. (1975). *Self-Directed Learning.* Chicago: Follet

Kolb, DA. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Upper Saddle, NJ: Prentice Hall.

Kougot, B. and Zander, U. (1992). 'Knowledge of the firms, combinative capabilities and the replication of technology', *Organization Science*, 3, 3, August, 14-37.

Lavis, J.N., G. Permanand, A.D. Oxman, S. Lewin, and A. Fretheim. (2009). 'SUPPORT Tools for Evidence-Informed Health Policymaking (STP) 13: Preparing and Using Policy Briefs to Support Evidence-Informed Policymaking.' *Health Research Policy and Systems*. 7 (suppl. 1): S13.

Légaré F, Borduas F, Jacques A, Laprise R, Voyer G, Boucher A, Luconi F, Rousseau M, Labrecque M, Sargeant J, Grimshaw J, Godin G. (2011). 'Developing a theory-based instrument to assess the impact of continuing professional development activities on clinical practice: a study protocol.' *Implement Sci.* Mar 7; 6, p. 17.

Lewin, K. (1951). *Field theory in social science; selected theoretical papers.* D. Cartwright (ed.). New York: Harper & Row.

Liang, L. (2007). 'The gap between evidence and practice.' *Health Aff.* 26(2), p. 119–121.

Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic Inquiry*. Newbury Park, CA: Sage Publications.

Lindlof, T. R., & Taylor, B. C. (2002). *Qualitative Communication Research Methods*. 2nd Edition. Thousand Oaks, CA: Sage.

Lippitt, R., Watson, J. and Westley, B. (1958). *The Dynamics of Planned Change*. New York: Harcourt, Brace and World.

Liyanage, C., Elhag T., Ballal, T., Li, Q. (2009). 'Knowledge communication and translation – a knowledge transfer model.' *Journal of Knowledge Management*. Vol. 13, Iss: 3, p. 118 – 131.

Lloria, MB. (2008). 'A review of the main approaches to knowledge management.' *Knowledge Management Research & Practice*, 6, p. 77–89.

Lomas, J, Haynes RB. (1988). 'A taxonomy and critical review of tested strategies for the application of clinical practice recommendations: from "official" to "individual" clinical policy.' *Am J Prev Med.* 4(Suppl 4), p. 77–94.

Lomas, J. (1993). 'Diffusion, dissemination, and implementation: who should do what?' Ann NY Acad Sci. Dec 31; 703, p. 226–35.

Lomas, J. (2000). 'Connecting research and policy.' *Canadian Journal of Policy Research*. 1, p. 140-4.

Lomas, J. (2007). 'The in-between world of knowledge brokering.' *BMJ*. January 20; 334 (7585), p. 129-32.

Love, J. M. (1985). 'Knowledge Transfer and Utilization in Education.' *Review of Research in Education*. 12, p. 337-386.

Lowe, M.M., Aparicio A, Galbraith R, Dorman T, and Dellert E. (2009). 'The Future of Continuing Medical Education Effectiveness of Continuing Medical Education: American College of Chest Physicians Evidence-Based Educational Guidelines.' *CHEST*. 135 (3), suppl, p. 69S-75S.

Machlup, F. (1980). *Knowledge: Its Creation, Distribution, and Economic Significance.* Volume I, Princeton, NJ: Princeton University Press.

Marlow, B. (2004). 'The future sponsorship of CME in Canada: Industry, government, physicians or a blend?' *CMAJ*. July 20; 171(2), p. 150–151.

Marlow, B. (2007). 'Rebuttal: Is CME a drug-promotion tool? NO.' *Can Fam Physician*. November; 53(11), p. 1877.

Merriam, Sharan B. (1998). *Qualitative Research and Case Study Applications in Education*. San Francisco: Jossey-Bass.

Miller, GE. (1990). 'The assessment of clinical skills/competence/performance.' *Acad Med*. 65, p. S63-7.

Mitton, C., Adair, CE., McKenzie, E., Patten, SB., and Waye, Perry B. (2007). 'Knowledge transfer and exchange: review and synthesis of the literature.' *Milbank Q*. Dec; 85(4), p. 729-68.

Moore, D. (2007). in 'The continuing professional development of physicians, A framework for outcomes evaluation in the continuing professional development of physicians.' Eds Davis, D., Barnes, B., Fox, R.. American Medical Association Press, Chicago, IL, p. 249-74.

National Center for the Dissemination of Disability Research (NCDDR). (1996). 'A review of the literature on dissemination and knowledge utilization.' http://www.ncddr.org/du/products/review/index.html. Accessed June 2011.

Negri, A. (2008). 'Setting Quality Standards in European CME.' European CME Forum. http://www.europeancmeforum.eu/ecf2008/presentations/2_anegri.pdf. Accessed June 2011.

Nelson, R. R., and Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge, MA: Belknap Press.

Nonaka, I. (1994). 'A Dynamic Theory of Organizational Knowledge Creation.' *Organization Science.* (5:1), February, p. 14-37.

Nonaka, I., and Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York.

Norman GR, Shannon SI, Marrin ML. (2004). 'The need for needs assessment in continuing medical education.' *BMJ.* 328(7446), p. 999-1001.

Nutley, S.M., Davies, H.T.O. (2002). 'Evidence-based policy and practice: moving from rhetoric to reality.' Discussion Paper 2, Research Unit for Research Utilisation, University of St Andrews. http://www.ruru.ac.uk/PDFs/Rhetoric%20to%20reality%20NF.pdf. Accessed June 2011.

O'Dell, C., Jackson, C. (1998). *If Only we Know What we Know: The Transfer of Internal Knowledge and Best Practice*. Free Press, New York, NY.

OECD. (1996). 'The Knowledge-Based Economy', in *OECD, Science, Technology and Industry Outlook Outlook*. Paris: OECD.

OECD. (2000). *Science, Technology and Industry Outlook*. Paris: OECD.

OECD. (2005). 'The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data.' *Oslo Manual, Third Edition.* Paris: OECD, p. 15.

OECD. (2009). *OECD Science, Technology and Industry Scoreboard 2009*. Paris: OECD.

OECD. (2010). *Towards a Measurement Agenda for Innovation.* Paris: OECD.

Oliver, M. L. (2009). 'The transfer process: Implications for evaluation,' in J. M. Ottoson & P. Hawe (Eds.), *Knowledge utilization, diffusion, implementation, transfer, and translation: Implications for evaluation. New Directions for Evaluation*, 124, p. 61-73.

Osborne, M. (2003). 'University Continuing Education – International Understandings', in M Osborne and E Thomas (eds), *Lifelong Learning in a Changing Continent: Continuing Education in the Universities of Europe*, Leicester: National Institute of Adult Continuing Education.

PAAB (Pharmaceutical Advertising Advisory Board). (2009). 'Code of Advertising Acceptance.' http://www.paab.ca/local/files/PAAB%20Code%20English%2005272009%20FINAL.pdf Accessed August 2011.

Patton, M. (1985). *Qualitative evaluation and research methods.* (2nd ed.) Thousand Oaks, CA, Sage Publications.

Pawlowski, S.D. and Robey, D. (2004). 'Bridging user organizations : Knowledge brokering and the work of information technology professionals.' *MIS Quarterly*. 28 (4), p. 645-72.

Peck, C., McCall, M., McLaren, B. & Rotem, T. (2000). 'Continuing Medical Education and Continuing Professional Development: international comparisons.' *BMJ*. 320, p. 432-5.

Piaget, J. (1967). *Biology and Knowledge*. Chicago: University of Chicago Press.

Plihon, Dominique. (2004). *Le nouveau capitalisme.* Paris: La Découverte.

Polanyi, M. (1962). *Personal Knowledge: Toward a Post-Critical Philosophy*. New York: Harper Torchbooks.

Polanyi, M. (1967). *The Tacit Dimension*. London: Routledge and Keoan Paul.

Pope, C. & Mays, N. (1995). 'Qualitative Research: Reaching the parts other methods cannot reach: an introduction to qualitative methods in health and health services research.' *BMJ*. 311 (6996), p. 42-5.

Queeney, D.S. (1996). 'Continuing Professional Education', in R.L. Craig (ed.), *The ASTD Training and Development Handbook* (4th ed.), New York: McGraw-Hill.

Queeney, D.S. (2000). 'Continuing Professional Education', in A. L. Wilson and E.R. Hayes (eds), *Handbook of Adult and Continuing Education*, San Francisco: Jossey-Bass.

RCPSC (Royal College of Physicians and Surgeons of Canada). (2007). 'Ethics and the Royal College.' http://rcpsc.medical.org/about/ethics_e.php Accessed August 2011.

RCPSC. (2011a). 'Maintenance of Certification Program.' http://rcpsc.medical.org/opa/moc-program/index.php Accessed June 2011.

RCPSC. (2011b). A continuing commitment to lifelong learning - The Royal College of Physicians and Surgeons of Canada Guide to Maintenance of Certification. http://rcpsc.medical.org/opa/moc-program/documents/MOC_Long_Guide_ENG.pdf Accessed July 2011.

RCPSC. (2010). '2010 Annual Review.' http://rcpsc.medical.org/about/documents/Royal_College_2010_e.pdf Accessed July 2011.

Rich B. (1979). 'The pursuit of knowledge.' *Knowledge: Creation, Diffusion, Utilization*. 1(1), p. 6-30.

Rogers EM. (1986). 'Models of knowledge transfer: Critical perspectives.' In: Beal GM, Dissanayake W, Konoshima S, editor. *Knowledge Generation, Exchange, and Utilization.* Boulder: Westview Press.

Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.), New York: Free Press.

Rowley, J. (2006). 'Where is the wisdom we have lost in knowledge?. *Journal of Documentation*. Vol. 62 No. 2, p. 251-70.

Royal College of Psychiatrists (2007). 'Continuing Professional Development and Continuing Medical Education Glossary of Terms.' http://www.rcpsych.ac.uk/docs/Glossary%20of%20Terms%20CPD.doc. Accessed July 2011.

Rx&D. (2010a). 'New Medicines, Better Health Outcomes.' https://www.canadapharma.org/en/about/documents/20100308_Backgrounder_New_Medicines_Better_Health_Outcomes_EN.pdf. Accessed July 2011.

Rx&D. (2010b). 'Code of Ethical Practices.' https://www.canadapharma.org/en/commitment/healthcare/pdfs/2010%20-%20Code%20of%20Ethical%20Practices_en.pdf Accessed August 2011.

Ryan, B. & Gross, N.C. (1943). 'The diffusion of hybrid seed corn in two Iowa communities.' *Rural Sociology*. (8), p. 15-24.

Sackett, D.L., Rosenberg, W.M., Muir Gray, J.A., Haynes, R.B., and Richardson, W.S. (1996). 'Evidence-based Medicine: What It Is and What It Isn't.' (Editorial). *British Medical Journal*. 312, no. 7023, p. 71–72.

Schönström, M. (2005). 'Creating knowledge networks: lessons from practice.' *Journal of Knowledge Management*. Vol. 9 No. 6, p. 17-29.

Schumpeter, J. (1934). *The Theory of Economic Development.* Cambridge, MA: Harvard University Press.

Schön DA. (1987). *Educating the reflective practitioner: toward a new design for teaching and learning in the professions.* San Francisco, CA: Jossey-Bass.

Senge, Peter M. (1990). *The Fifth Discipline*. Doubleday/Currency.

Shannon, C., W. Weaver. (1949). *The Mathematical Theory of Communications.* Urbana, IL: University of Illinois Press.

Shaneyfelt, T. (2001). 'Building bridges to quality.' *JAMA*. 286, p. 2600–1.

Sherman, L. (2008). 'State of CME: US and Global.' European CME Forum. http://www.google.co.uk/url?sa=t&source=web&cd=1&ved=0CBoQFjAA&url=http%3A%2F%2Fwww.europeancmeforum.eu%2Fecf2008%2Fpresentations%2F1_lsherman.pdf&ei=hx8wTun-H4S6hAfw3M05&usg=AFQjCNEz4X7J1wTOl8u2FuBOHJwsSt7RkA&sig2=qKEfY95VuaJXwEdKeiQO3g Accessed July 2011.

Sjoberg, S. (2007). 'Constructivism and learning.' In Sjoberg, S., E. Baker, B. McGaw, and P. Peterson. *International Encyclopedia of Education*. 3rd Edition, Oxford: Elsevier.

Snow, C.P. (1959). *The two cultures and the scientific revolution*. Cambridge, England: Cambridge University Press.

Soekijad, M., Huis in 't Veld, M.A.A. and Enserink, B. (2004), 'Learning and knowledge processes in inter-organizational communities of practice.' *Knowledge and Process Management*. Vol. 11 No. 1, p. 3-12.

Spender, J.C. (1996a). 'Making Knowledge the Basis of a Dynamic Theory of the Firm.' *Strategic Management Journal* (17), Special Issue, p. 45-62.

Spender, J.C. (1996b). 'Organizational Knowledge, Learning, and Memory: Three Concepts in Search of a Theory.' *Journal of Organizational Change Management* (9), p. 63-78.

Sriharan, A., Murray, R., Pardell, H., Silva, H. (2009). 'An overview of CME/CPD credit systems around the world.' *Journal of Medical Marketing*. 9, p. 145-50.

Starke, I. (2006). 'III Session: Challenges in Continuing Professional Development and the Regulation of the Profession.' *Educación Médica*. 9 (4A), p. 184-93.

Straus SE, Tetroe JM, Graham I. (2009). 'Defining knowledge translation.' [Part 1 of a series] *CMAJ*. 181(3-4), p. 165-8.

Street RL, Makoul G, Arora NK, Epstein RM. (2009). 'How does communication heal? Pathways linking clinician-patient communication to health outcomes.' *Patient Educ Couns*.74, p. 295–301.

Sung NS, Crowley WF Jr, Genel M, et al. (2003). 'Central challenges facing the national clinical research enterprise.' *JAMA*. 289, p. 1278-1287.

Tetroe JM, Graham ID, Foy R, Robinson N, Eccles MP, Wensing M, et al. (2008). 'Health Research Funding Agencies' Support and Promotion of Knowledge Translation: An International Study.' *The Milbank Quarterly*. 86(1), p. 125–155.

The Cochrane Library. (2011). The Cochrane Central Register of Controlled Trials. onlinelibrary.wiley.com/o/cochrane/Cochrane_clcentral_articles_fs.html Accessed August 2011.

Thompson, G.N., C.A. Estabrooks, and L.F. Degner. (2006). 'Clarifying the Concepts in Knowledge Transfer: A Literature Review.' *Journal of Advanced Nursing*. 53(6), p. 691–701.

Tiffany C. (1994). 'Analysis of planned change theories.' *Nurs Manage*. 25, p. 60–62.

Tiffany C, Cheatham A, Doornbos D, Loudermelt L, Momadi G. (1994). 'Planned change theory: Survey of nursing periodical literature.' *Nurs Manage*. 25, p. 54–59.

Timmermans S, Mauck A. (2005). 'The promises and pitfalls of evidence-based medicine.' *Health Aff*. 24(1), p. 18–28.

Uhl, H. (1992). 'A brief history', In: A.B. Rosof and W.C. Felch (eds.) *Continuing medical education: A primer*. New York: Praeger.

United Kingdom General Medical Council. (2006). 'Good Medical Practice.' http://www.gmc-uk.org/guidance/good_medical_practice.asp. Accessed July 2011.

University of British Columbia. (2011). 'Revalidation.' http://www.ubccpd.ca/CME_Services/Revalidation.htm Accessed July 2011.

Vance, D.M. (1997), 'Information, knowledge, and wisdom: the epistemic hierarchy and computer-based information system.' Proceedings of the 1997 America's Conference on Information Systems.

van Kammen J, De SD, Sewankambo N. (2006). 'Using knowledge brokering to promote evidence-based policy-making: The need for support structures.' *Bull World Health Organ.* 84, p. 608-612.

Veybel, L. and Prieur, P. (2003). *Le knowledge management dans tous ces états: La gestion des connaissances au service de la performance.* Paris : Éditions d'Organisation.

von Krogh. G. (1998). 'Care in Knowledge Creation.' *California Management Review.* (40:3), p. 133-153.

Vygotsky, L.S. (1978). *Mind in Society – The Development of Higher Psychological Processes.* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.) Cambridge: Harvard University Press.

Ward, V.L., House, A.O., & Hamer, S. (2009). 'Developing a framework for transferring knowledge into action: a thematic analysis of the literature.' *J Health Serv Res Policy.* Jul;14(3), p. 156-64.

World Health Organization (WHO) (1996). Meeting Report on Developing a National System for Continuing Education for Health Personnel. Alexandria, Egypt, 24-27 July 1995: WHO.

WHO (2003). 'Implementation Research in TDR: conceptual and operational framework.' UNDP / World Bank / WHO. Special Programme for Research and Training in Tropical Diseases (TDR). http://apps.who.int/tdr/publications/tdr-research-publications/ide_framework/pdf/ide_framework.pdf Accessed May 2011.

WHO (2006). 'Bridging the "Know–Do" Gap.' Meeting on Knowledge Translation in Global Health. Geneva, Switzerland. 10–12 October 2005: WHO.

APPENDIX A

Excerpt from the CFPC Guide to Mainpro, Mainpro-M1 Accreditation Eligibility Criteria (CFPC, 2011b, p. 13-15.)

Mainpro-M1 Accreditation Eligibility Criteria

The following section outlines basic eligibility requirements for Mainpro-M1 accreditation. Unless otherwise listed, the criteria apply to CME and CPD programs submitted for both Provincial and National Mainpro-M1 accreditation. Satisfaction of the criteria listed here does not guarantee Mainpro-M1 accreditation.

For more information on the accreditation process, please contact the Mainpro Accreditation Coordinator, Deborah Blois, at 905.629.0900 or 1.800.387.6197, extension 319, or at mainpro@cfpc.ca.

1. Program Planning and Development

Provincial Mainpro-M1

At least one (1) CFPC member (excludes non-member Mainpro participant) from the province where the program is to be held must be a member of the CME/CPD program planning committee* and have substantial involvement in development, planning, and implementation of the program.

As part of the application process, substantial involvement is confirmed when the CFPC member verifies that:

- he or she has had substantial input into the program being submitted for accreditation (eg, contributed to the consideration of learning needs, the determination of learning objectives, and the choice of speakers or presenters);
- the content of the program is relevant to family medicine;
- the planning, content, and conduct of the program meets pertinent ethical standards; and
- he or she has been informed of any financial or non-financial incentives associated with the program.

* *He or she should also be a member of the scientific committee, where such a committee exists.*

National Mainpro-M1

At least one (1) CFPC member (excludes non-member Mainpro participant) from each of the five (5) defined CFPC regions (British Columbia/Alberta, Saskatchewan/Manitoba, Ontario, Quebec, and Atlantic Canada) must be a member of the CME/CPD program planning committee* and have substantial involvement in the development, planning, and implementation of the program.

As part of the application process, substantial involvement is confirmed when each of the CFPC members verifies that:

- he or she has had substantial input into the program being submitted for accreditation (eg, contributed to the consideration of learning needs, the determination of learning objectives, and the choice of speakers or presenters);
- the content of the program is relevant to family medicine;
- the planning, content, and conduct of the program meets pertinent ethical standards; and
- he or she has been informed of any financial or non-financial incentives associated with this program.

* *He or she should also be a member of the scientific committee, where such a committee exists.*

⚠ Asking a CFPC member to review a finalized CME/CPD program is not acceptable; CFPC members must meet the provided definition of substantial involvement.

2. Program Design and Content

A needs assessment must be conducted to identify the perceived and unperceived educational needs of the target audience.

- The needs assessment is intended to identify an absence or deficit in knowledge or skills (a "gap" between current practice and best practice activities).
- There are many acceptable needs assessment methodologies, including but not limited to the following.
  - Chart audits, focus groups, and patient surveys
  - Local epidemiological studies and pre-tests administered to participants
  - Evaluations from previous CME/CPD events and expert opinion consensus
  - Review of audio or video tapes of patient encounters, clinical recall interviews, and direct observation of performance

For more information on needs assessments, please refer to **Appendix 2.**

Learning objectives must be developed according to the results of the needs assessment and be advertised to participants before the program (eg, during registration and in advertisements). There must be evidence that the needs assessment has been used as the basis for establishing learning objectives and program design and content.

For more information on learning objectives, please refer to **Appendix 3.**

The CME/CPD program content must be relevant to family medicine. Relevancy is determined by whether or not the content:

- fosters improved patient care by family physicians;
- addresses at least one of the four principles of family medicine (the content could address an area of potential growth for family medicine as long as it relates to the four principles); and
- has been proven or generally accepted by the medical community.

For a list of generally acceptable and unacceptable topics, see **Appendix 1.**

There must be evidence of appropriate use of *brand* and *generic* names in CME/CPD programs and associated materials.

- Generic names should be used where possible in accredited programs.
- If brand names are used, the brand name should appear in parentheses after the generic name. Every drug mentioned should be referred to in a similar manner.

3. Communication with Speakers/Presenters

CPD providers should give specific instructions to presenters and speakers regarding their involvement in the program. Specifically, presenters and speakers must be provided with the following.

- The learning objectives pertaining to their part of the program
- A description of the program format
- A description of the target audience
- A description of the nature of the evaluation to be completed by participants

In addition, it is the responsibility of CPD providers to ensure that the content and materials presented are the same as those submitted and approved or accredited. If changes are to be made to approved or accredited program content, CPD providers must first contact the CFPC Chapter office (for Provincial Mainpro-M1 programs) or the National Office (for National Mainpro-M1 programs) to discuss the intended changes. If changes are deemed by the Chapter office or National Office to be substantial, the program must be resubmitted for accreditation (along with payment of the administrative fee plus applicable GST/HST).

4. Learning Methodology, Delivery, and Environment

The environment, teaching techniques, and use of audiovisual aids must be conducive to effective learning and appropriate to the learning objectives.

- There must be sufficient opportunity for discussion among participants.
- In the case of didactic presentations, there must be adequate time set aside for speakers or presenters to address questions from participants.
- No social activity may take precedence over the educational activities.

Participants must have an opportunity to evaluate the program. Evaluation may be completed through use of forms, discussion groups, or other techniques deemed appropriate and useful.

- The evaluation must include a question on content and presenter bias.
- CPD providers must retain copies of completed evaluation forms or response summaries for at least one (1) year in case the program is audited by the CFPC.
- The CFPC recommends that organizers provide a summary of the evaluations to all speakers and presenters for personal and professional development.
- Feedback sought from participants should be used by CPD providers to improve future presentations of the program.

For more information on evaluations, please refer to Appendix 5.

5. Ethical Standards and Disclosure

The planning, content, and conduct of programs must follow acceptable ethical standards. Ethical standards must be adhered to during all stages of planning and implementation of CME/CPD programs. All Mainpro-accredited programs must be able to withstand public scrutiny.

- The planning, development, and implementation of CME/CPD programs must comply with the Canadian Medical Association's Policy on Physicians and the Pharmaceutical Industry (2007) and Rx&D's (Canada's Research-Based Pharmaceutical Companies) Code of Ethical Practices (2010). If any disagreement exists between these two, the CMA policy should prevail.
- Disclosure information and accompanying verbal statements should be included as part of all Mainpro-accredited programs; all speakers and presenters must disclose financial affiliations with manufacturers of products or service providers related to the presentation (see Appendix 7 for more information on disclosure of potential for conflict of interest).

⚠ Inappropriate influence from external sources, such as funding, on any aspect of a program is unacceptable.

APPENDIX B

Participant invitation email

Dear XXX,

I am an MBA-Research student at the Université du Québec in Montreal (UQÀM) and am currently working on my Master's thesis on knowledge transfer and translation in the medical field, with a comparative study of continuing medical education (CME) and continuing professional development (CPD) in Canada, the United States and England. My focus is on the stakeholders involved in the knowledge transfer process in CME/CPD, including universities and the pharmaceutical industry, as well as the social, political, ethical and other implications of this process.

I have been researching different associations and types of CPD/CME tools used throughout Canada, the United States and England and recently completed a series of interviews in London, England. I am now finalizing my series of interviews in Canada and beginning interviews in the United States.

I was wondering if I might be able to interview you for my thesis, about your experiences with CME/CPD initiatives in the U.S. as well as your views on sources of knowledge in CPD, best practices in knowledge transfer, as well as examples and outcomes of CME/CPD programs.

I am currently in Montreal, Canada until XXX, and would be able to speak with you over the phone (or on Skype) at your convenience, should you be willing and available to do so. The interview should take around an hour of your time, maximum.

Please let me know if you would be interested in speaking with me over the next couple of weeks and I will arrange my schedule accordingly.

Thank you in advance for your assistance!

I look forward to hearing from you.

Should you have any further questions about my thesis in the meantime, please do not hesitate to contact me via email or phone. My mobile number in Canada is: XXX.

With kind regards,
Mireille Patoine

Interview Guide

- Your background and involvement in CME/CPD, and your role at XXX

- The XXX's stance on and approach towards CME/CPD

- Programs/activities that have been conducted in the past and what is being done now (Types of CME/CPD tools/activities/programs, and other sources of knowledge and information for family physicians.)

- Statistics on CME/CPD involvement of XXX members (Which programs seem to work best/least? Is there an audit system in place?)

- Changes you have observed within the CME/CPD landscape in the last few years/decades (if applicable)

- Regulatory or other political issues affecting CME/CPD (Recertification, revalidation, etc.)

- Social issues affecting doctors and their involvement in CME/CPD activities

- Ethical and economic issues in dealing with funding and commercial sponsors (if applicable to the XXX)

- Any other important issues pertaining to the CME/CPD landscape in the United States, Canada, England

- Your overall perceptions of the CME/CPD system in the United States (compared to Canada and the UK, if applicable)

Content Analysis - Initial Categories and Codes

Category	Code
Knowledge producer	k_prod
Linkage Agent	link
Knowledge User	k_user
Format	format
Accrediting Body – providers	accred_prov
Accrediting Body - physicians	accred_phys
Local Context	cntxt_loc
Outcomes	Outcome
Surrounding contextual elements	cntxt_surround
- Political environment	Pol
- Economic environment	Econ
- Legal environment	Legal
- Technological environment	Tech
- Social environment	Soc
- Ethical environement	ethic

Example of part of an Interview Transcript with Coding

B: But more the study of how... how to change doctors' behavior, how doctors learn. I became very interested in that initially and did a little bit of research on the differences between different categories of physicians – whether family physicians learn differently from surgeons and internists. So that became an interest of mine. And then looking at experimenting with different forms of delivery. I've worked on using games for CME, building interactivity into programs. **[FORMATS]** A lot of these areas are of interest.

M: I think we'll get back to those studies if possible a little bit later, but I just wanted to know... your experiences at the College itself. So you became Director of CPD. What exactly do you think has changed? What are the major changes in CME? First I'd like to know what you think of the change between calling it CME and now moving towards calling it CPD. Is there...? Could you comment on what has happened over the years?

B: Ummm, sure. I mean the term CME in the traditional sense... Well let's start with the CME when I started practice and that was usually hospital clinic days once a year with a wide variety of programs that were selected by a group of specialists and who determined what to deliver to their audience of family doctors **[CME FORMATS: BEFORE]**. And at one point in time, these rounds attracted 500 to 1000 people in downtown Toronto. And... it was more of an update of what was new over the year... And so it was episodic, not necessarily needs-based. **[CME FORMATS: BEFORE]** The planning committee did not have representatives of the target audience, and it was primarily lecture format and so... we've evolved from that point in time to involving family doctors in the planning of their own education, which is a basic adult learning principle. We have gone beyond lectures into small group learning, into self-assessment and individual learning projects and awarding credits for them. And we have increased the level of evaluation of our programs to look at effectiveness beyond the happiness index and look more into intent to change or commitment to change. And in some cases measure changes in knowledge and behavior. **[CHANGES: FORMATS, CONSIDERATIONS]**

M: Mmmmhmm

B: Umm. The other big change is in relation to the pharmaceutical industry. Back in those days, the pharmaceutical industry was the major – the only – funder and a large provider of CME. **[ECON, FUND: BEFORE]** And the fundng from industry has declined – as has their involvement – as the rules become more and more rigourous in terms of preventing education from being used as promotion. **[ECON, FUND: BEFORE]**

M: Mmmhmm and where does the funding come nowadays if funding from the pharma industry has declined?

B: It's self-funded. So doctors pay registration fees for their education. And the government has become a player in education as well in terms of providing funding for some educational programs. **[ECON, FUND: NOW]**

M: OK

B: And with the various association agreements across the country, doctors are receiving funding from the government that can be used towards their own education, their own selection of education. **[ECON, FUND: BEFORE]**

Content Analysis – Revised (final) categories and codes

Categories and Coding		
Category	**Code**	**Explanation or Key Words**
Knowledge producer	K_PROD	Sources of knowledge and research (universities, hospitals, research centers)
Linkage Agent	LINK	Those who "bridge" producers and users (CME/CPD providers, consultants) Roles & resp. – NEED TO BE TRAINED
Knowledge User	K_USER	Physicians (specialists & GPs) Includes the various roles of the physician: carer, teacher, administrator, researcher (Also includes other healthcare professionals that require CME) Their drivers of motivation Time, availability of work study leave
Format	FORMAT	"Medium" or vehicle used to transmit knowledge (types of activities) Types, modalities, Old: didactic, traditional, lecture New: simulation technology, online, audience response systems (interactivity) Flexibility
Content + considerations Vs. requirements	CONSIDERATIONS	Topics Needs-based, practice relevancy, needs assessment, or scanning Instructional design Everyone learns differently Adult education concepts, Schon – reflective practice More than participation Effectiveness, outcomes, evaluations, impact, performance improvement, practice enhancement, commitment to change Evidence-based medicine

		Gaps in knowledge/practice
Accrediting Body – providers	ACCRED_PROV	Those who accredit providers (review programs to ensure they meet certain requirements). Rules, roles and responsibilities - Differences per province
Accrediting Body - physicians	ACCRED_PHYS	Rules, roles and responsibilities - Differences per province
Outcomes	OUTCOME	Assessment, evaluation Learning, change of behaviour, adopting, skills, improvement
Quality	QUAL	Review process (pre-), audit (post-), meeting requirements and considerations Bias
CME Field	CME FIELD	"CME Enterprise" Taxonomy required, professionalization of the field, field as a career, structure, laws, codes, regulations that define it - Before meeting planners (25 years ago) - Collaboration vs. Competition within the field - Bureaucracy - Standardization, globalization
CME vs. ME, GME	CME vs. ME, GME	Less well developed, less resources Shared concepts Same phases of evolution – CME going through was ME, GME went through before
Changes	CHANGES	Shifts, CME in transition Reasons, timeline, what has changed
Pharma	PHARMA	Before vs. now, separation, funding, marketing vs. education, motivations, ulterior motives
Barriers	BARRIERS	Accessibility (various settings) Bureaucracy, confusion Peers (availability of resources)

		Time Funding – budgets, subsidizing, marketing, "breaking even" Resources Sharing infrastructure
United States	US	Financial Technology-driven Entrepreneurial Regulation to control excesses Competition, adversarial Grassley reports
Canada	CAN	Open, friendly Healthcare as a social, human right
ENGLAND	UK	Shipman Appraisal of doctors every year UK – time issues – 48h work time directive Less time for study leave Austerity measures: less budgets
Surrounding contextual elements	CNTXT_SURROUND	Atmosphere, culture
- Political environment	POL	CME as voluntary vs. mandatory Revalidation, recertification Reactive vs. proactive
- Economic environment	ECON	Barrier Funding – pharma – commercial support – rules, distance, firewalls Lack of funding Budgets, breaking even, marketing
- Legal environment	LEGAL	Commercial support – rules, distance, firewalls – ethics Medicine – self-monitoring
- Technological environment	TECH	Physicians adopting new technology
- Social environment	SOC	Public confidence, self-regulation Responsibility, accountability

- Ethical environment	ETHIC	Ethics code, undue influence, bias (pharma – funding), conflicts of interest, Public confidence, self-regulation Understanding the difference between right & wrong GREY AREA!
Grey area	GREY AREA	Topics to cover ("standard clinical practice" vs. off-label use, safety, treatment options, early studies)