Strengthening Evidence-Based Addictions Programs:

A Policy Discussion Paper

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**Alberta Alcohol and Drug Abuse Commission,
Canadian Centre on Substance Abuse,
and the National Policy Working Group**

December 2003

CONTENTS

Acknowledgments

The author would like to express sincere appreciation to Edward Sawka and Darlene James of the Alberta Alcohol and Drug Abuse Commission for the direction and insight they provided in the preparation of this paper. Appreciation is also extended to members of the Canadian Centre on Substance Abuse (CCSA) National Policy Working Group,[*] as well as to other reviewers who contributed their time and expertise to comment on prior drafts. (The views expressed in this document do not necessarily reflect those of the organizations to which members of the Working Group belong.)

Executive Summary

During the last decade in the addictions field, the terms "best practice," "evidence-based practice" and "research transfer" have been used more and more frequently in conversations and in the literature. This paper examines how these terms, and the concepts they represent, are evolving in the addictions field, as well as in related fields such as medicine, nursing, and social work. Within this context, this paper considers how to enhance the research-to-practice exchange in the addictions field. While a review of the activities related to research transfer and evidence-based practice would be very useful, it is beyond the scope of this paper.

Evidence-Based Practice

The concept of evidence-based practice has its origins in the concept of evidence-based medicine. The originators of evidence-based medicine define it as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients."[1] Building on this definition, the *practice* of evidence-based medicine is defined as "integrating individual clinical expertise with the best available external clinical evidence from systematic research."[2]

The debate surrounding evidence-based practice in the medical literature is extensive and at times contentious. Many objections to evidence-based medicine are based on the notion that it advocates "cookbook" medicine and ignores unique patient needs and characteristics. Advocates stress this was never the intention, and emphasize that evidence from research is only one component of a clinical decision, with other components including the circumstances of the patient, patient wishes, clinical judgment and expertise. Other contentious issues are related to political concerns about the use of evidence-based medicine by bureaucrats, politicians, and managed care organizations.

A large part of the debate surrounding evidence-based medicine and evidence-based practice is related to the nature and relevance of the evidence and the research methods used to generate it. In general, critics perceive that the most commonly used tools (randomized controlled trials, systematic reviews, and meta-analysis) take a narrow approach that diminishes the consideration of other types of evidence such as naturalistic enquiry, case material, and experiential sources. Advocates indicate that these concerns are a misinterpretation, and assert evidence-based practice is not restricted to randomized controlled trials, systematic reviews, and meta-analyses, but involves tracking down the best external evidence.

Research Transfer

The literature concerned with activities such as research transfer, knowledge transfer, and information dissemination includes numerous discussions of terminology and the differences between knowledge and research, diffusion and dissemination, and transfer and utilization. One author, who stresses that such debates are a waste of energy, defines

the real issue as ensuring that efforts include 1) the "mechanical distribution of information about innovative programs or practices" and 2) the "provision of technical assistance and other resources to help potential adopters wrestle with the very complex processes of actually considering and implementing an innovation."[3] For the purposes of this paper, the term "research transfer" is used when discussing dissemination activities such as information dissemination, research utilization, and knowledge transfer.

Drivers to Program Improvement

In the addictions field, a number of factors are driving the interest in evidence-based practice. These factors include:
- an impetus within government and funding agencies toward greater accountability and a shift to demands for evidence of effectiveness;
- healthcare policy and delivery placing increasing value on standardized treatment procedures, cost-effectiveness, and outcomes; and
- growing awareness on the part of community practitioners of the importance of delivering empirically supported therapies as funding sources begin to emphasize best-practice guidelines for programs.

Practical Limitations

Just writing up evidence and publishing it, even making it widely available on the Internet, does not guarantee changes in practice. In the literature, to illustrate the length of time it can take for research to be implemented, articles often refer to the 263 years it took to integrate evidence on the treatment of scurvy into the diets of British sailors. Even though the world has made great technological advances in information management and dissemination since the days of trying to implement citrus into the diets of sailors, technology still depends on people, and some of the limitations and factors that held back the adoption of the evidence on scurvy still exist. These limitations and factors include the following.

- Human factors such as beliefs, attitudes, and values; differences in perspectives among researchers, practitioners, and policy makers; and heterogeneity in the background, training, and clinical perspectives of practitioners.

- Organizational factors such as staff lacking the necessary knowledge and skills; variables such as job burnout; and other dynamics, such as poor leadership, a culture averse to change, and bureaucratic constraints.

- Decision-making factors such as lack of time, information overload, budgetary pressures and political considerations.

- Community-level factors such as differing backgrounds and training; differing perspectives on prevention; lack of community readiness; and competing political interests and funding priorities.

Balancing Research-Based Evidence with Practice

What can the addictions field learn from the debate taking place in the medical field? How can research-based evidence be balanced with practice? Some wisdom and perspective can be found in the following story.

> The ward was full, so I put him in my room as he was moribund and screaming and I did not want to wake the ward. I examined him. He had obvious gross bilateral cavitation and severe pleural rub. I thought the latter was the cause of the pain and screaming. I had no morphia, just aspirin, which had no effect. I felt desperate. I knew very little Russian then and there was no one in the ward who did. I finally instinctively sat down on the bed and took him in my arms, and the screaming stopped almost at once. He died peacefully in my arms a few hours later. It was not the pleurisy that caused the screaming, but loneliness. It was a wonderful education about the care of the dying. I was ashamed of my misdiagnosis.[4]

The physician in this story is Archie Cochrane, whose publications arguing for improvements in the effectiveness and efficiency of the healthcare system planted the seeds for the evidence-based medicine movement. The story provides perspective related to evidence-based practice and illustrates the importance of maintaining a focus on the client, and shows that in some cases effective interventions are based on instinct rather than evidence. It also illustrates that it will never be possible to translate research into practice to specify what should be done in every situation.

Considerations for Enhancing the Research-to-Practice Exchange

The literature on transferring research to practice is complex and, unfortunately, inconclusive on those strategies that are most effective. While the research is limited on the roles that individuals and organizations play in facilitating research transfer, the following summary reports on what is known, and suggests considerations for moving forward.

- One of the main theories put forward is the importance of building relationships between researchers and practitioners and policy makers, and encouraging sustained dialogue among these groups. Practical ways to build relationships and encourage dialogue include engaging early on in research studies, interactivity at different phases of the studies, writing up results in a way that will be useful for the practitioners and policy makers, and conducting colloquia between practitioners and researchers.

- Changes are required by funding bodies and research organizations. Consideration should be given to support the transfer of research findings with a commitment similar to the support currently provided to the research studies, incorporating dissemination strategies in the proposal and planning stages of research projects, and providing incentives to researchers to focus on the practical applications of their findings.

• While summarizing research in a format appropriate for the intended audiences encourages dissemination, the effort needs to go further. In order to encourage groups such as practitioners and policy makers to actually consider adopting and implementing the research-based evidence, summaries and guidelines need to be combined with other interventions such as individual instruction, active learning strategies, engagement of local opinion leaders, and incentives. As well, it is important to take a transparent approach and acknowledge components that represent a significant change in practice and other barriers.

• One of the key factors in successfully transferring research to community providers is to ensure that the core elements of an intervention that contributed to its success are clearly explained. Other factors include ensuring that the components that contributed to the success of the programs are not diluted, and identifying a local "champion" in the community.

• Workforce development is a relatively recent concept that has emerged in the health sector and the addictions field in response to the need to develop an adequate workforce to address the challenges being faced. Advocates of the concept stress that in order to develop an adequate workforce, a paradigm shift is required to refocus away from an exclusive orientation on training to one that encapsulates factors such as organizational development, change management, evidence-based knowledge transfer, and skill development. Workforce development offers opportunities for facilitating research transfer, implementing evidence-based practice, and bridging barriers at organization and systemic levels.

• Knowledge management holds potential for enhancing the research-to-practice exchange both within and among organizations through identifying, organizing, and sharing research studies such as program evaluations, as well as supporting and facilitating communication between researchers, practitioners, and policy makers through mechanisms such as "communities of practice."

Conclusion

In the addictions field, powerful forces are driving the movement for evidence-based practice. In the last decade, government and funding agencies have continued to push for improved efficiency, accountability and demonstrated effectiveness. As well, the growing evidence base in the addictions field has raised the bar to doing better quality research. All of these factors create demand for evidence-based practice and research transfer that will challenge the field to move forward. While it will never be possible to translate research into practice in a way that specifies what should be done in every situation, the tools and concept of evidence-based practice can provide guidance and lead the way to strengthening evidence-based programs.

A. Introduction

During the last decade in the addictions field, the terms "best practice" and "evidence-based practice" have been used more and more frequently in conversations and in the literature. The terms are intuitively appealing. Most people would prefer to use a "best" practice rather than one that is mediocre, and it is probably safe to say that no one would want to declare that their program is based on "worst" practice. Similarly with "evidence-based practice,": when considering a new treatment approach or a change in program direction, the prospect that the new intervention or program practice is based on empirical evidence adds reassurance to a venture in a new direction.

Other terms are also in frequent use. In discussions of the transfer of research to policy and program practice, terms such as research transfer, knowledge transfer, knowledge utilization, diffusion of innovations, and information dissemination are often used synonymously. As terms evolve, frequent use can lead to a "shorthand" approach in communications between professionals and in the literature. Meanings can vary depending on factors such as the situations in which the terms are being used and the professional backgrounds of the people using them.

This paper examines how terms such as evidence-based practice, best practice, research transfer, knowledge transfer, and knowledge utilization—and, more importantly, the concepts they represent—are evolving in the addictions field, as well as in related fields such as medicine, nursing, and social work. Within this context, the paper considers how to enhance the research-to-practice exchange in the addictions field. (While a review of the activities related to research transfer and evidence-based practice would be very useful, it is beyond the scope of this paper.)

The Alberta Alcohol and Drug Abuse Commission and the Canadian Centre on Substance Abuse, as members of the National Policy Working Group, produced this paper to inform national policy development and activities regarding research transfer and evidence-based practice.

Overview of the Literature

The literature discussing evidence-based practice, research transfer and knowledge utilization is multi-disciplinary. While much discussion of evidence-based practice is found in the medical literature (as part of the discussions underway related to evidence-based medicine), articles on this topic are also found in the social work and addictions literature. Similarly, discussions of research transfer and knowledge utilization are found in the medical, social work, and addictions literature, as well as the communications and information science literature. Articles discussing evidence-based practice tend to be concerned with the nature of the evidence and methods used to generate it, while articles on research transfer and knowledge utilization are concerned with barriers and with strategies to facilitate the process. While the concepts of evidence-based medicine,

evidence-based practice, research transfer and knowledge utilization are interrelated, few authors discuss a conceptual framework of how they are related.

To research this paper, the author searched databases of medical, social work, addictions, information sciences, psychology, and organizational development journal literature. To complement the journal literature, she also searched websites concerned with knowledge and research transfer, as well as the sites of addictions organizations in Canada, Australia, the United Kingdom and the United States.

B. Context

1. Evidence-Based Practice

The concept of evidence-based practice has its origins in the idea of evidence-based medicine. Several definitions of both concepts can be found in the literature. The originators of evidence-based medicine define it as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients."[1] Building on this definition, the *practice* of evidence-based medicine is defined as "integrating individual clinical expertise with the best available external clinical evidence from systematic research."[2]

Evidence-based practice has attracted considerable criticism in the medical literature. Critics warn that evidence-based medicine ignores the individual needs and characteristics of patients, suppresses clinical freedom, narrowly defines evidence, and supports cost cutting. Given these criticisms, the developers of the above definitions wrote an editorial in the *British Medical Journal*, clarifying the terms:

> By individual clinical expertise we mean the proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice. Increased expertise is reflected in many ways, but especially … the more thoughtful identification and compassionate use of individual patients' predicaments, rights, and preferences in making clinical decisions about their care. By best available external clinical evidence we mean clinically relevant research, often from the basic sciences of medicine, but especially from patient centred clinical research.[3]

A definition from the social work literature defines evidence-based practice as "the conscientious, explicit and judicious use of current best evidence in making decisions regarding the welfare of service-users and carers."[4] A search of the addictions literature revealed no definition for evidence-based practice. However, the related term "best practice" is defined in a recent Health Canada publication as "emerging guidelines, gleaned from key expert perspectives and supported by the literature, on the approaches and elements of treatment that appear to result in successful treatment outcomes …. Best practices are recommendations that may evolve, based on ongoing key expert experience, judgment and perspective, and continued research."[5] Although that text defined "best

practice" for the purposes of a specific project, this passage is quoted here to indicate how the concept is evolving in the addictions literature.

Beginnings of the Evidence-Based Medicine Movement

At least two authors trace the beginnings of the current concept of evidence-based medicine to clinical epidemiologists at McMaster University who wrote articles in the *Canadian Medical Association Journal* in the 1970s and 1980s to guide readers on how to appraise the medical literature.[6] In the 1990s, these articles were expanded and published in the *Journal of the American Medical Association (JAMA)*. In the *JAMA* articles, the authors provided a systematic approach to interpreting the medical literature and applying the findings to clinical practice. The term "evidence-based medicine" appeared in the articles.[7]

Other events in the early 1970s also planted seeds for evidence-based medicine. In 1972, Archie Cochrane published his oft-cited *Effectiveness and Efficiency: Reflections on Health Services*.[8] This book argued for improvements in the effectiveness and efficiency of the healthcare system. Cochrane noted that medical decisions were often based on expert opinion or observational studies that did not distinguish between the effective and ineffective. In order to determine whether medical interventions were effective, Cochrane stressed it was important to conduct randomized controlled trials (RCTs).

During the 1970s, RCTs became widely used to evaluate the efficacy of medications and medical technologies.[9] Also in the early 1970s, the field of nursing was experimenting with one dimension of evidence-based medicine: research utilization. One large and oft-cited research utilization project carried out during this time was the Conduct and Utilization of Research in Nursing.[10]

In a 1979 publication, Cochrane identified the need for ready access to reliable reviews of the available evidence: "It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomized controlled trials."[11] In 1992, in response to Cochrane's call for systematic, up-to-date reviews of all relevant RCTs of health care, the Cochrane Collaboration was developed. This international organization aims to help people make well informed decisions about health care by preparing, maintaining and ensuring accessibility to systematic reviews of the effects of healthcare interventions.[12] As part of the Cochrane Collaboration, a number of collaborative review groups develop systematic reviews. The Drug and Alcohol Group and the Tobacco Addictions Group are of most interest to the addictions field.[*]

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[*] Also of interest is the recently established Campbell Collaboration. Modelled after the Cochrane Collaboration, it aims to help people make informed decisions about interventions in the social, behavioural and educational arenas. It prepares, maintains and disseminates systematic reviews of studies of interventions.

Why Evidence-Based Medicine?

Several reasons are cited in the literature for the growth of the evidence-based medicine movement. In one author's view, evidence-based medicine offers tools and resources for finding and applying current best evidence from research for the care of individual patients, as well as a means to change the clinician's task from one of accessing and reading the original medical literature to one of finding pre-assessed research evidence.[13] It also provides a process to combine research from a number of studies. Writing of the research needs of the clinician, Ledbetter explains: "Only in rare instances will a single research study offer irrefutable answers to a clinical question. In addition, we frequently find two or more studies addressing the same question with very different results. The consequence is that locating one, even two studies provides inadequate information for changing practice."[14]

With respect to effectiveness and efficiency, Laupacis highlights three reasons for the initial evidence-based medicine movement:

> 1) the use of harmful and ineffective therapies were of concern; (2) effective therapies were underused; and (3) fiscal realities placed increasing importance on the need to use effective and cost-effective therapies.[15]

Issues Related to Evidence-Based Medicine

The debate surrounding evidence-based medicine in the medical literature is extensive and at times contentious. In the words of one author, it is "counterproductive and unnecessary."[16] As an example of the polarized nature of the debate, an advocate for evidence-based medicine views the concept of "basing clinical practice on scientific evidence" as so "intuitively obvious as to need no further discussion." This author argues that "it has repeatedly been shown that patients who take evidence-based therapies do better than those who do not."[17] On the opposing side, one of the more forceful critics views evidence-based medicine "as a dangerous delusion; erroneous in both rationale and conclusions, and a potentially lethal weapon in the hands of misguided regulators and reformers."[18]

Many objections to evidence-based medicine are based on the notion that it advocates "cookbook" medicine and ignores unique patient needs and characteristics. Advocates stress this was never the intention. They emphasize that evidence from research is only one component of a clinical decision; other components include the circumstances of the patient, patient wishes, clinical judgment and expertise.[19] However, critics argue that evidence-based medicine oversimplifies the complex and interpersonal nature of clinical care.[20] Furthermore, its decision-making process does not take the uniqueness of patients and their needs into account.[21] These critics stress that the use of evidence-based medicine must be subordinate to the provision of personal medical services such as the consultation.[22]

Related to the arguments surrounding clinical care is a discussion of the concept of "values-based practice." This is the theory and practice of effective decision making in healthcare situations involving different and potentially conflicting value perspectives. Values-based practice emphasizes good process in the form of improved clinical practice skills. This approach is considered a complement to evidence-based medicine.[23]

Other contentious issues are related to political concerns about the use of the evidence-based medicine by bureaucrats, politicians, and managed-care organizations. While advocates see evidence-based medicine as a means for effectiveness and efficiency in health care, critics are concerned that the movement is driven by financial considerations rather than concern for the quality of care. They warn that information from evidence-based medicine is being used to encourage minimalist purchasing in the name of science, and that it supports bureaucratic and managed care interests and political demands for accountability and cost containment.[24]

Finally, there is concern that therapies that lack an evidence base would be ignored. In the psychoanalysis literature, Fonagy warns that a therapy without substantial evidence would be thought to be without substantial value. This would mean resources would be allocated in favour of treatments for which rigorous evidence of effectiveness is relatively easily collected.[25]

In the social work arena, the debate is not as extensive, but it is just as polarized as in the medical literature. In the social work literature, advocates view evidence-based practice as "a new paradigm that promotes more effective social interventions by encouraging the conscientious, judicious, and explicit use of the best available scientific evidence in professional decision making."[26] Opponents think evidence-based practice ignores the complexity of actual decision-making processes in social work and oversimplifies the challenges social workers face in their day-to-day practice.[27] As well, there is doubt about the success of transferring evidence to differing contexts. Frost argues that since "much social scientific evidence, particularly that gathered through evaluation, is situational," it is not possible to simply transfer a mechanism with a positive outcome to another context and assume that it will work.[28]

In the addictions field, there does not appear to be a debate surrounding evidence-based practice per se. However, Tober asserts that the hope the addictions field held for the findings of Project MATCH is "testimony to the perceived need for evidence to inform practice."[29] (This alcohol treatment trial conducted in the 1990s to investigate the effectiveness of matching treatment modes to client attributes found little evidence to support matching clients, on the basis of individual characteristics, with different treatment modalities.) The discussion in the addictions field seems to focus on the limitations of the evidence used to develop practice guidelines (for instance, the lack of standard conditions among treatment trials),[30] the difficulties of interventions in the addictions field yielding evidence upon which to plan the provision of treatment,[31] and differing views on what constitutes effective treatment and on how effectiveness is determined.[32] Authors in the health promotion and mental health literature raise issues relevant to the addictions field. In the health promotion literature, the concept of evidence

related to health promotion interventions is viewed as more complex than that in medical interventions. This view argues that "health promotion is concerned not only with health outcomes, such as morbidity and mortality, but also with outcomes that are difficult to quantify, such as equity, community empowerment, and community and social well-being."[33] And in the mental health literature, authors argue that much of the published research on evidence-based practices was conceived without an understanding of the recovery vision. As a result, the published evidence is not relevant and does not support the recovery movement. Anthony and colleagues assert that future research on evidence-based practice must focus on outcomes, such as quality of life and self-esteem, that are meaningful to people's recovery.[34]

In summary, the debate on evidence-based medicine is many sided, and many of the views are polarized. Nevertheless, at least one author has found middle ground and provides this practical advice: "If we are to use evidence-based medicine, we should use it as appropriately as possible. This entails understanding its strengths as well as its limitations. Thorough understanding of both will lead to more balanced use of its tools."[35]

Nature of the Evidence

A large part of the debate surrounding evidence-based medicine and evidence-based practice is related to the nature and relevance of the evidence that is being collected and the research methods used to generate it. Conduct of research involves a number of factors: asking the right research question, selecting the research method best able to reliably answer the research question, minimizing bias, and producing generalizable and replicable results.

In general, critics perceive that the most commonly used tools (randomized controlled trials [RCTs], systematic reviews, and meta-analysis) take a narrow approach that diminishes the consideration of other types of evidence, such as naturalistic enquiry, case material, and experiential sources.[36]

Advocates say that these concerns are a misinterpretation, and assert that evidence-based medicine is not restricted to RCTs, systematic reviews, and meta-analyses, but involves tracking down the best external evidence.[37] They describe "best available external clinical evidence" as "clinically relevant research, often from the basic sciences of medicine, but especially from patient-centred clinical research into the accuracy and precision of diagnostic tests (including the clinical examination), the power of prognostic markers, and the efficacy and safety of therapeutic, rehabilitative and preventive regimens."[38]

Other concerns about evidence are related to the criteria used to assess the quality of the evidence. A number of scales exist in the literature, and most grade evidence according to study design. Study designs that carry the least risk of bias are usually ranked the highest.[39] Some authors argue that scales should be based on other factors, such as study conduct, consistency of evidence or clinical relevance.[40] The Canadian Cochrane Network and Centre places randomized controlled trials and systematic reviews of

randomized controlled trials in the first level of evidence, and quasi-experimental studies in the second level of evidence.[41]

The following research designs and methods receive the most attention in the literature.

Randomized Controlled Trials

Randomized controlled trials (RCTs), which originated in the medical field, are considered the building blocks of clinical knowledge. The Cochrane Collaboration defines an RCT as an "experiment in which investigators randomly allocate eligible people into intervention groups to receive or not to receive one or more interventions that are being compared. The results are assessed by comparing outcomes in the treatment and control groups."[42] Due to the rigorous methods used to control bias, RCTs provide the most valid, dependable research about the effectiveness of an intervention.[43] They are most commonly conducted to examine the effectiveness of pharmaceutical therapies.

While RCTs are known as the "gold standard" of research design, critics contend that the "evidence does not consider the complexities of the individuality of each patient,"[44] and that "clinical practice frequently generates questions that are not easily answered by randomized trials."[45]

In addition, the practical limitations of conducting controlled trials are seen to affect the relevance of the evidence generated. For instance, the trial conditions are viewed as artificial, and the results, expressed as averages, do not provide the variety of outcomes observed in individual participants.[46] Other limitations of the trial conditions include these: large numbers of patients are required in order to provide statistically valid results; many medical and neurological conditions are unsuitable for trials; and patients who are too old or too young, or experiencing coexisting illnesses, are usually not included in trials.[47]

In community-based health promotion, limitations include ethical and logistic problems in maintaining randomization of subjects over long periods, absence of experimental conditions in the real-world setting, contamination of control subjects, and the multi-dimensional nature of health promotion interventions.[48]

Some authors offer options to address the difficulties of RCTs. McDonald suggests regarding randomized trials as no more than the "first cut," which is then followed by a more extensive program of evaluation where treatment is actually taking place.[49] In the addictions literature, Nurco and Hanlon propose an "intermediate level of the application of research findings that involves replication of study procedures in selected clinical settings."[50] Similarly, a systematic review of randomized and nonrandomized studies of alcohol treatment concluded that, due to the "contrasting strengths and weaknesses of these studies, they should be considered as complementary forms of treatment evaluation in the alcohol treatment field, and perhaps more generally."[51]

Systematic Reviews

A systematic review is defined as

> a review of a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarize the results of the included studies.[52]

Systematic reviews synthesize large quantities of information into a manageable form, identify where research results are consistent and where results vary, and summarize reliable research evidence that supports the benefits and risks of healthcare practice. Systematic reviews differ from traditional literature reviews due to the strict design that minimizes bias. Stevens and Ledbetter view systematic reviews as the "major feature" that distinguishes the "new paradigm" of evidence-based practice from previous research utilization efforts, such as individual studies and traditional literature reviews.[53]

Those who support systematic reviews say that the use of systematic and explicit methods minimizes bias in the identification, selection and summation of the evidence.[54]

Concerns about systematic reviews include "interpretive, observational and descriptive research methods that have commonly been either excluded from the review or are classified as low-level evidence."[55] Another concern is the danger of underestimating the evidence from relevant literature (even though the research is not well designed).[56] Finally, one author points out that it is rare to find a systematic review devoted to adverse effects.[57]

Meta-analysis

Meta-analysis is defined as "the use of statistical techniques in a systematic review to integrate the results of included studies …[;] sometimes used as a synonym for systematic reviews, where the review includes meta-analysis."[58] For systematic reviews where meta-analysis can be conducted, the quantitative synthesis of the data from different studies provides a gain in statistical power. Manser and Walters cite an illustrative example of this from the results of a meta-analysis of randomized, controlled studies of post-operative radiotherapy for non-small-cell lung cancer. Prior to the meta-analysis, the literature on the value of radiotherapy for patients who had undergone complete surgical resection was inconclusive. Several small trials had reported conflicting results; individually, these studies had insufficient statistical power to determine the effectiveness of the intervention. A meta-analysis was conducted, and the results showed that post-operative radiotherapy had a statistically significant adverse effect on survival.[59]

Another advantage of meta-analysis is related to the generalization of the findings. For instance, meta-analysis can be used to explore how applicable trial results are for different populations or settings. In the above example, the reviewers found evidence that

the effect of post-operative radiotherapy was more detrimental among patients with stage one of the disease than among those with stage two.

While meta-analysis is viewed in the literature as offering several advantages, some authors warn the results of the meta-analysis should be considered guides; results should be interpreted with caution[60] and there are dangers in uncritical use of the results.[61]

Drummond sums up the warnings about meta-analysis by stating that it "is only as good as the studies upon which it is based." He notes that there are weaknesses in meta-analytical reviews as well as in specific treatment studies. He comments that while meta-analysis provides a helpful view of a range of treatment approaches and suggests which types of treatment might be most effective, the method also obscures methodological weaknesses and differences between study trials.[62] One concern of special note is related to research that is not published in scientific journals and is known as the "grey" or "fugitive" literature. Williams and Garner contend that for any given research area it is impossible to tell how many studies have been conducted but never reported. They speculate on the effects of this on the conclusions of meta-analyses.[63]

Quasi-experimental Design

Another way of structuring research is the quasi-experimental design. This approach is well suited where randomization is not feasible, and it is frequently used to evaluate programs. Quasi-experimental designs are a good approximation of a "true experiment," and can be carried out in a natural setting. When planned well-, quasi-experimental design can provide conclusions about cause-and-effect relationships and can be conducted in a natural setting. Furthermore, the results are generalizable since subjects are often unaware that they are being studied. In general, these designs 1) observe participants before and after receiving an intervention (program), or analyze observations across many time points; 2) observe a group that does not receive an intervention (control) and compares this with the group that does receive an intervention; or 3) examine a number of variables, some of which are expected to be influenced by the intervention and others not.[64]

There is some controversy concerning the evidence about the effectiveness of healthcare interventions based on quasi-experimental and observational (QEO) studies. A recent systematic review comparing estimates of effectiveness derived from RCTs and QEO studies recommended that standards for reporting QEO studies should be introduced. The review stressed that in the long term, such standards might be expected to improve the standard of research, as well as of reporting.[65]

Qualitative Research

In an article discussing qualitative research and evidence-based medicine, Popay and Williams cite Sackett, one of the originators of evidence-based medicine, to illustrate the growing legitimacy of qualitative research within the evidence-based medicine movement: "Depending on the question, qualitative research may be the only appropriate

method to be used in finding a valid and useful answer. It is congruent with the philosophy of EBM (Evidence-Based Medicine)."[66]

Qualitative research methods use an array of data collection strategies, including participant observation and interviews, diaries and journals as data sources for insight into human experience and behaviour.[67] Qualitative research "focuses on the meanings that people attach to experiences, the relationship between knowledge, experience and action, and the social factors that shape these processes."[68] Qualitative research can contribute to understanding of why people continue to smoke despite the health risks, or why clinicians do not embrace evidence of effective therapies.

Popay and Williams summarize some ways qualitative research could support evidence-based medicine. These include linking qualitative research to quantitative research as a means to "understand why interventions work, to improve the accuracy and relevance of quantitative studies, to identify appropriate variables to be studied in quantitative research, to explain unexpected results from quantitative work, and to generate hypotheses to be tested using quantitative methods." Other ways qualitative research can contribute to evidence-based medicine include exploring "taken-for-granted" practices in health care (such as waiting lists); insights into factors that shape clinical behaviour (such as poor uptake of innovations); and picking up on small but profound changes in people's conditions, which more structured methods would miss.[69] Other advantages of qualitative research, such as observational studies, include a cost lower than that of RCTs, a broader range of participants, and a role in situations when clinicians and patients are unwilling to accept the chance mechanism of randomization when assigning treatment.[70]

Some work has begun on synthesis of the findings of qualitative studies. This process, referred to as "meta-synthesis," provides a framework for the synthesis of multiple non-experimental studies. As well, the Cochrane Collaboration established the Qualitative Research Methods Working Group to address issues related to the inclusion of qualitative data in systematic reviews.[71]

In summary, the literature surrounding evidence and the methods used to gather it is complex. The following quote puts the debate into practical terms and provides perspective for those attempting to find their way through the maze of articles and opinions: "There has to be the acknowledgement that any evidence is only a tool, which ultimately requires human judgment. Best available evidence means using the wide range available, from the clinical anecdote and experience to the meta-analysis and systematic reviews of randomized controlled trials."[72]

2. Research Transfer

The literature concerned with activities such as research transfer, knowledge transfer, and information dissemination includes many discussions of terminology. Considerable energy (and column space) is consumed in attempts to track the evolution of terms and to discuss the differences between knowledge and research, diffusion and dissemination, and transfer and utilization.[73] Few authors bring evidence-based practice into the

discussion. However, one does touch on it briefly, viewing evidence-based practice as much broader than research dissemination, innovation diffusion, or research utilization, because it encompasses the use not only of research findings, but other forms of practice knowledge as well.[74]

Thomas E. Backer, author of numerous articles and books on this topic, in a recent article calls for the need to re-examine the language by which we define dissemination activities such as research transfer and knowledge utilization. He stresses that in substance abuse and other fields, energy is wasted on debating distinctions that do not matter, and that such debates obscure the real issue. Backer portrays dissemination in the substance abuse field as uncomfortably similar to the scenario in the film *Groundhog Day*, in which Bill Murray's character keeps reliving the same 24-hour period.

In the interest of moving forward, Backer describes dissemination as involving "strategic efforts to get information about innovations—programs and best practices—out to individuals, organizations and communities, and to help them wrestle with the complex challenges of getting that information used to create change in the real world." He asserts that essentially synonymous terms include technology transfer, diffusion of innovations, knowledge utilization, research utilization, and knowledge transfer. Whatever term is used, Backer defines the real issue as ensuring that efforts include 1) the "mechanical distribution of information about innovative programs or practices" and 2) the "provision of technical assistance and other resources to help potential adopters wrestle with the very complex processes of actually considering and implementing an innovation."[75]

This paper uses the term "research transfer" when discussing dissemination activities such as information dissemination, research utilization, and knowledge transfer.

C. Dynamics of Transferring Research-Based Evidence in Addictions Programs

1. Drivers to Program Improvement

In the addictions field, a number of factors are driving the interest in evidence-based practice. One factor that emerged in the 1990s is the impetus within government and funding agencies toward greater accountability, and thus the demand for evidence of effectiveness.[1] In Alberta, for instance, the early- to mid-1990s saw government focus on deficit and debt reduction and downsizing, and the introduction of business planning and performance measurement. Following the achievement of budget reductions (i.e., efficiency), attention has turned to service effectiveness.[2] In the United States, the services that developed during the 1970s and 1980s shrank during the 1990s. As a result, competition for funding has increased, the financing of care has changed, and demands for accountability and efficiency are forcing free-standing community-based agencies to seek mergers with hospitals and health plans or to integrate with mental health programs.[3]

Concurrent with the changes within government and funding agencies, changes in healthcare policy and delivery have placed increasing value on standardized treatment procedures, cost-effectiveness and outcome.[4] In this environment, community

practitioners are becoming more aware of the importance of delivering empirically supported therapies as funding sources begin to emphasize best-practice guidelines for treatment programs.[5]

2. Culture and Systemic Shifts

Other factors leading to the increasing attention to evidence and effectiveness are related to the culture and systemic shifts in the addictions field. The past several decades have seen substantial changes: in the scientific knowledge base from which the field operates, in the plethora of substances with which agencies have to contend, and in standard treatment and intervention protocols.[6] Simultaneously, addiction service delivery systems in Canada have changed significantly, especially in the last decade.

In the early years of the addictions-treatment field, the growth of Alcoholics Anonymous and the 12-step recovery program were major influences. By the end of the 1950s, most Canadian provinces had established departments, commissions or foundations to provide or coordinate addiction treatment services. Many new services were established. The mid-1960s saw a rapid expansion of services for addictions, including detoxification centres, outpatient programs, short- and long-term residential facilities, and aftercare services. In 1987, Canada's Drug Strategy, conceived as a multi-sectoral partnership, was launched. It stimulated a range of activity, including the support of innovative treatment and rehabilitation services across the country. In the early 1990s, driven by changes in the structure of health services across the country and a general environment of reduced expenditures for health services, most government substance abuse services were integrated into community health and social services delivery systems. Only three provinces (Alberta, Manitoba, and Ontario) now have specialized alcohol and drug abuse foundations or commissions.[7]

During the past few decades, Canada lacked a coordinated approach to addictions research. Funding was been "sporadic and piecemeal," and the sharing of research and knowledge suffered as a result.[8]

Then, in the spring of 2003 Canada's Drug Strategy was renewed. A highlight of the new strategy is funding for research activities. As well, in the fall of 2003, more than 70 leading addictions researchers, as well as other specialists from across Canada, met to develop a strategic addictions research agenda. This ranges from basic and clinical science to social, cultural and environmental research about alcohol and illicit drugs. Forum participants agreed on nine strategic directions that alcohol and illicit drug research should take in Canada. "Research into knowledge exchange and dissemination" is one of these. This work includes developing knowledge about the ways that the public, practitioners, scientists and policy makers can exchange information and skills.[9] Both the renewal of Canada's Drug Strategy and the development of an addictions research agenda present opportunities to link research with policy and practice in Canada.

Also, of note are the "best-practice" documents that Health Canada has been publishing since 1998. The documents summarize current research and expert opinion, including

recommendations for best practice. They are intended to improve the effectiveness of current programs and encourage the establishment of new programs. The documents cover topics such as these: prevention of substance-use problems among young people; methadone maintenance treatment; concurrent disorders; and treatment and rehabilitation for general populations as well as for seniors, women and youth.

In this changing and complex environment, addiction agencies and other services charged with delivering treatment and prevention programs face increasing challenges. In the US, tens of millions of dollars have been allocated to activities to link substance abuse treatment and research, and some authors suggest that the time might be right for "bridging the gap" between researchers and practitioners. However, while they acknowledge that researchers and practitioners are beginning to dance together, it is unclear, in the words of one author, if the dance will look like a waltz or the "funky chicken. "[10]

3. Practical Limitations

In 1998, the United States Institute of Medicine released the findings of a committee charged with, among other things, facilitating new strategies for partnerships between community-based treatment organizations and the research community. The committee found that one of the inhibiting factors was an inadequate base of knowledge about research transfer specific to the addictions field.[11] Nevertheless, the literature does provide some insights into the factors that limit the research-to-practice exchange.

Individual Factors

To begin, knowledge does not guarantee changes in practice. Articles on research transfer often refer to the integration of citrus into the diet of British sailors to illustrate the length of time it can take for research to be implemented. Estabrooks writes, "We *knew enough* about scurvy 263 years before the British Merchant Navy introduced citrus as a routine dietary supplement to shipboard diets. If knowing enough were all it took, a goodly number of the diseases and social plagues of contemporary society would have been eradicated."[12] Even though the world has made great technological advances in information management and dissemination since the days of trying to implement citrus into the diets of sailors, technology still depends on people. And some of the factors that held back the adoption of the evidence on scurvy still exist. Just writing up the evidence and publishing it—even making it widely available on the Internet—is not enough.

Marinelli-Casey and colleagues conclude that human factors such as beliefs, attitudes and values influence whether new treatments will be implemented.[13] These factors also affect the support given to evidence. For example, feelings that evidence based on randomized controlled trials ignores evidence from non-experimental and qualitative research can present barriers to knowledge transfer.[14]

Differences in perspectives among researchers, practitioners and policy makers also affect knowledge dissemination and use. For instance, the US Institute of Medicine

committee found that researchers perceive that many research-developed innovations have improved the treatment of drug abuse, and they believe that patient outcomes would be significantly improved if research-tested modalities were fully utilized in treatment.[15] Others report that researchers value the scientific method, empirical data and evidence-based practices.[16]

Practitioners have a different perspective. They may view the scientific agenda as esoteric, sterile and detached from the real world.[17] Faced with the challenges of providing services on a daily basis, they might perceive that reimbursement is too low to allow for implementation of new practices, or that many clinical trials exclude the classes of patients that are most prevalent in community-based agencies. Consequently, they do not consider findings from such research to be relevant.[18]

Another factor is the heterogeneity in the background, training and clinical perspectives of clinicians. Individual differences in professional (education, training, years of experience, treatment orientation) and personal (recovery status) background may greatly influence the success of any one approach to research transfer.[19]

Some authors argue that for successful research transfer to occur, it is important to develop an understanding of these factors. Ball et al. surveyed clinicians from different treatment programs and orientations who had volunteered to be trained in motivational interviewing or enhancement therapy. The study found that clinicians' allegiance to particular schools of therapy was related to their level of education and recovery status. For instance, recovering counsellors integrated more 12-step principles into their treatment, while masters-level counsellors integrated more psychodynamic work. One noteworthy finding was that a greater number of years of counselling experience was related to higher endorsement of a range of counselling techniques from different theoretical orientations. This suggests that more experienced addiction counsellors were more flexible, eclectic or integrative in their conceptualization and treatment of addiction.[20]

Organizational Factors

Some research has investigated factors related to organizational dynamics. One of these factors is the skill-level of staff. A review of the psychiatric research literature investigated why some staff members who treat people with mental illness fail to use evidence-based practice. The review revealed that staff members studied lacked the knowledge and skills to assimilate the practices, and variables such as job burnout undermined their interest in innovative practices. The review also found that certain organizational dynamics, such as poor leadership, a change-averse culture, insufficient collegial support, and bureaucratic constraints hindered the treatment teams' ability to implement and maintain innovative approaches.[21]

Decision-Making Factors

A topic that attracts quite a bit of interest in the literature is the use of research in decision making and policy development. Two recent Canadian conferences on research transfer in health concluded that while the goal of research transfer is to make research evidence available to the planners and policy makers, all decisions are not evidence-based, and the research evidence amassed for any given policy is always subject to context and values. Factors from emotion to budgetary pressures, from peer pressure to politics, all play a role.[22]

A systematic review summarized health-policy makers' use of research evidence . Commonly reported barriers were power and budget struggles. Lack of timeliness and of relevance of research were also reported.[23] A qualitative study investigating factors that facilitate or impede evidence-based policy making at the local level in the UK National Health Service also found that the research evidence on decision making was tempered by factors such as financial constraints and shifting timescales. The study reported research was more likely to affect policy in indirect ways, including shaping policy debate and mediating dialogue between service providers and users.[24]

Lack of time, information overload, and the type of information typically used by decision makers are also factors in the uptake of evidence-based research. Regarding lack of time, physicians typically have less than one hour a week to read. This factor is complicated by their lack of training in appraising published research.[25] With respect to information overload and type of information, the US Institute of Medicine committee reported that policy makers, frustrated by the flood of material, tend to rely on familiar sources to select and summarize information as issues emerge.[26]

Community Factors

The challenges that influence the transfer of research-based evidence to programs at the community level have been addressed to a limited extent in the literature. Results from a survey of prevention project directors, evaluators and consultants identified reasons for the gap between research and prevention programs. These include differing backgrounds, training, perspectives on prevention, lack of community readiness, and system-level barriers such as competing political interests and funding priorities.[27] Another reason for the limited adoption of research-based prevention programs lies in the sheer numbers of strategies and programs, and in the conflicting information about which strategies and programs are "research-based."[28]

Recent research has identified several barriers to maintaining or "institutionalizing" community prevention efforts. These include a perception by community leaders of a lack of empowerment to continue prevention work; insufficient preparation of community leaders for adoption of evidence-based programs; the inclination to continue an ineffective approach because of the costs already incurred; and a general perception that no prescribed evidence-based approach will work because each community has unique needs.[29]

One of the factors in successfully transferring research to communities is to ensure that the elements that contributed to the success of a program are not diluted.[30] Over the past 20 years, several large-scale, comprehensive community-wide programs have had a major influence in shaping community-based programs.[31] These programs include the Stanford Five-City Project (an education program on cardiovascular disease risk factors), the Minnesota Heart Health Project, and Project Northland (an alcohol-use prevention program for early adolescents). While comprehensive community-wide programs such as these have demonstrated positive effects for health behaviours, in order to succeed the core elements of the interventions must be adequately implemented. For instance, to reduce adolescent problem behaviours in a community, the interventions must reach enough of the young people in the community to make an impact.[32] As well, the interventions must conform closely enough to the original model to preserve the behaviour change mechanisms that made it effective. For example, a 16-week social problem-solving skills curriculum that has been effective in preventing drug abuse will not be equally effective if only half the lessons are used.[33]

Another challenge related to delivering programs in the community is the use of existing channels, such as the school system. For instance, prevention programs might not fit with the school's view of academic achievement, or components of the program might not be delivered due to teachers' lack of comfort with the approach required.[34]

Summary of Practical Limitations

While the research base is limited, the practical limitations that have been seen to influence the uptake of evidence-based research are complex and varied. These limitations include the following elements.

- Human factors such as beliefs, attitudes and values; differences in perspectives among researchers, practitioners and policy makers; and heterogeneity in the background, training, and clinical perspectives of practitioners.

- Organizational factors such as staff lacking the necessary knowledge and skills; variables such as job burnout; and other dynamics, such as poor leadership, a culture averse to change, and bureaucratic constraints.

- Decision-making factors such as lack of time, information overload, budgetary pressures and political considerations.

- Community-level factors such as differing backgrounds and training; differing perspectives on prevention; lack of community readiness; and competing political interests and funding priorities.

D. Considerations for Enhancing the Research-to-Practice Exchange

1. Balancing Research-Based Evidence with Practice

What can the addictions field learn from the evidence-based debate in the medical field? How can research-based evidence be balanced with practice? Some wisdom and perspective can be found in this story:

> The ward was full, so I put him in my room as he was moribund and screaming and I did not want to wake the ward. I examined him. He had obvious gross bilateral cavitation and severe pleural rub. I thought the latter was the cause of the pain and screaming. I had no morphia, just aspirin, which had no effect. I felt desperate. I knew very little Russian then and there was no one in the ward who did. I finally instinctively sat down on the bed and took him in my arms, and the screaming stopped almost at once. He died peacefully in my arms a few hours later. It was not the pleurisy that caused the screaming, but loneliness. It was a wonderful education about the care of the dying. I was ashamed of my misdiagnosis.[1]

The physician in this story was Archie Cochrane, telling of the time he spent in a World War II prisoner-of-war camp. Cochrane indicates that this episode was a wonderful education in the care of the dying. The story also provides a perspective on evidence-based practice. It illustrates the importance of maintaining a focus on the patient or client, and shows that in some cases, effective interventions are based on instinct rather than evidence. Both of these points are significant for the addictions field. They are further illustrated by Finney, writing on the limitations of using alcohol treatment trials to develop practice guidelines:

> It will never be possible (or desirable) to translate research into practice in a way that specifies what should be done for every patient, at every moment, in every encounter with a provider in the patient's treatment course. Treatment will always be a clinical art as well as a science. Presumably, that is why the term practice "guidelines" is used, rather than practice prescriptions.[2]

As "a way forward," a model proposed for the social-work field is relevant for the addictions field. Frost proposes a pragmatic model of policy and practice formation that recognizes that in the real world of policy and practice research, evidence must be located within a range of other significant factors. This "RIPE" model is an attempt to demonstrate that policy and practice are determined by a complex and dynamic process that combines the influences of research and evaluation findings (R), ideological positions (I), political disputes (P), and economic realities (E). (As well, this acronym suggests that when certain factors come together, the time may be "ripe" for change.) The RIPE model attempts to provide a framework that reflects the complexities of decision making in the real world.[3]

How can the "best" aspects of the evidence-based medicine movement be applied to enhance the research-to-practice exchange in the addictions field? While it will never be possible to translate research into practice in a way that specifies what should be done in every situation, the tools and concept of evidence-based practice can provide guidance to program and policy development. Perhaps the answer can be found in this recent quote from the Alberta Alcohol and Drug Abuse Commission's newsletter, *Developments*: "Best practices should be more than a goal or an endpoint; it should be a philosophy, a mindset that influences actions taken at every step in the process."[4]

2. Advancing Research Transfer

The literature on research transfer is inconclusive on which strategies are most effective. The transfer of research depends on a number of factors; furthermore, to a large extent it depends on people. While the research is limited on individuals' and organizations' roles in facilitating research transfer, the following section reports on what we do know about facilitating research transfer, and suggests ways for moving forward.

Building Relationships and Encouraging Dialogue

One of the main theories about ways to facilitate research transfer involves the importance of building relationships between researchers, practitioners and policy makers, and encouraging sustained dialogue among these groups.[5] Some empirical research supports this theory. A systematic review revealed that one of the most commonly reported factors that facilitates health policy makers' use of research was personal contact.[6] Case studies suggest that dissemination is enhanced if researchers involve managers and policy makers in the development of the research framework and focus, and if investigators assume responsibility for seeing their research translated into policy.[7] The results of a researcher-in-residence program found brief technical-assistance visits stimulated adoption of research-based improvements in clinical practice at many of the participating sites.[8]

The challenge is to find practical ways to build relationships and to encourage personal contact and collaboration between researchers, policy makers and practitioners. The Canadian Institute for Health Information suggests engaging decision makers early in the research, and maintaining this relationship through collaborative working groups.[9] Shanley and colleagues cite an approach called "sustained interactivity." This involves multiple exchanges between researchers and potential users at different phases of the study, from planning to the analysis of the findings, to dissemination. It encourages researchers to get involved with practitioners in ongoing and practical ways, such as visiting the agencies, seeking their advice, designing forms and collecting data, and discussing and writing up results in a way that will be useful for the practitioners.[10]

The US Institute of Medicine committee examining ways to "bridge the gap" between practice and research found few examples of investigations where research questions are brought forward by treatment providers. However, the committee did cite "practice-based research networks" as an example of collaboration. These networks exist in several

branches of medicine, and are composed of practising clinicians who collaborate in collecting data and carrying out research. And, clearly emphasizing the need for collaboration between researchers and treatment providers, the committee's first recommendation calls for community-based treatment programs to seek "collaboration with researchers" and for researchers to encourage and, when appropriate, seek, "collaborative opportunities with community-based drug treatment organizations. "[11]

The "researcher-in-residence" program provides further insights into building relationships between researchers and practitioners, and into the role of organizational factors such as clinic management and staff turnover.[12] The program was a joint activity of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the Center for Substance Abuse Treatment (CSAT), the New York State Office of Alcoholism and Substance Abuse Services (OASAS), and the Alcoholism and Substance Abuse Providers of New York State (ASAP). The goal of the program was to encourage the adoption of research-based improvements in the treatment of alcoholism. NIAAA, CSAT, OASAS and ASAP tried to accomplish this by inviting research scientists to make brief visits to alcoholism treatment clinics. During these visits, the scientists gave clinic directors and their staff technical assistance on specific research-based improvements in clinical practice. Clinic directors then made the organizational changes necessary to adopt these improvements as a routine part of their treatment regimen. The program was piloted at six sites in New York State during 2000. The project review found the factors that contributed to the adoption of research-based improvements included the resourcefulness of clinic directors, leadership from top-level clinic management, and communication skills of the visiting researchers. The barriers to adoption of research-based improvements included staff turnover and the misperception that the project was a research study.

Shrivastava and Mitroff, writing in the management literature, argue that one challenge facing the use of research in decision making is the difference in the assumptions decision makers and researchers make.[13] They cite an article that identified that what is interesting to one audience (researchers) is unlikely to stimulate or excite another (decision makers) unless they share a common assumption base.[14] The authors present the concept of "frames of reference" for analyzing the differences between the assumptions made by decision makers and researchers. As a first step, researchers and decision makers must acknowledge their differing assumptions.

Other strategies advocated in the literature to encourage dialogue include conducting small colloquia between clinicians and researchers, and convening large annual dissemination forums on research results.[15]

In summary, responsibilities to enhance research transfer rest with all three groups: researchers, practitioners and policy makers. Methods to sustain dialogue among the groups include encouraging researchers, practitioners and policy makers to get involved in ongoing and practical ways, as well as conducting small colloquia between clinicians and researchers and convening larger annual dissemination forums on research results.

Commitments by Research and Funding Organizations

Bringing researchers and practitioners together to discuss issues, and involving practitioners and policy makers more closely in research projects, are important aspects of research transfer. However, however, certain broader changes by funding bodies and research organizations are also needed. For example, the Canadian Institute for Health Information identified a number of methods for encouraging the uptake of research findings. These included building a research transfer strategy into each project, employing specialists in research transfer, and sponsoring empirical investigations on the transfer of research findings.[16]

Similarly, others argue that research grants should include a research transfer component, incentives should be offered to researchers to focus on the practical application of their findings,[17] and dissemination should be carefully considered at the design stage of research projects.[18] An example of organizational commitment to research transfer is a strategy used by the United States Department of Agriculture: their agricultural extension agent system committed to spend a dollar on dissemination for every dollar spent on research.[19]

In summary, consideration should be given to support the transfer of research findings with a commitment similar to the support currently provided to research investigations. Areas for support include incorporating dissemination strategies in the proposal and planning stages of research projects, and providing incentives to researchers to focus on the practical applications of their findings.

Methods to Support Research Transfer

Several studies suggest better packaging and synthesizing of research will improve research transfer. A survey of local decision makers in the United Kingdom identified summaries of the available literature as a useful tool for producing local health policies.[20] Packaging evidence-based practices so that interventions are more accessible and user friendly are recommended for service providers in the mental-health field.[21] Building on this, the Canadian Institute for Health Information environmental scan identified the need for a range of research outputs appropriate to various target audiences, and urged the better use of websites.[22]

In general, the literature considers publishing and distribution of research findings (in the form of summaries or guidelines) to be a successful way to transfer research only if this is accompanied by other forms of support.[23] A systematic review evaluated the effectiveness of interventions in influencing the implementation of guidelines and the adoption of innovations in general practice. The review demonstrated that all interventions show considerable variation in effectiveness. Nevertheless, the authors concluded that the combination of information transfer (through reading materials, group education, etc.) and learning through social influence (individual instruction, peer review groups) or management support (resources, incentives) can be effective, as can reminders or feedback.[24]

In 2002, Howard Research reviewed the literature related to effective dissemination and implementation of clinical practice guidelines for physicians. Interventions that showed some success included engagement of local opinion leaders, highlighting of components that represent a significant change in practice, active learning strategies, peer influence processes, local and regional adjustments, acknowledgment and addressing of barriers, and incentives (such as continuing education credits). The review also stressed the use of multiple methods.[25]

It appears that while summarizing research in a format appropriate for the intended audiences encourages dissemination, the effort needs to go further. To encourage groups such as practitioners and policy makers to consider adopting and implementing research-based evidence, summaries and guidelines must be combined with other interventions, such as individual instruction, engagement of local opinion leaders, and provision of incentives. As well, it is important to take a transparent approach and acknowledge components that represent a significant change in practice and other barriers.

Research Transfer in Organizations and Communities

The literature related to community programs points out a gap between research and community prevention programs. It discusses some of the reasons, challenges and factors to consider when transferring evidence-based interventions to communities. While little is known about the processes that influence community coalitions to implement science-based prevention strategies, one of the factors in transferring effective science-based preventive interventions to community providers is to clearly explain the elements of an intervention that contributed to its success.[26] Other factors include ensuring that the components that contributed to the success of the programs are not diluted,[27] and identifying a local "champion" in the community.[28]

Finally, some insight can be found in studies of the "diffusion of innovations." These studies indicate that widespread implementation of innovative interventions is contingent on two conditions: community members must first recognize a problem or need, and then they must put the new idea into a form that addresses the problem as they perceive it.[29] Local ownership is viewed as a vital component of successful community health promotion interventions.[30] It is also a vital factor in community research.

Related to research transfer in organizations, as well as in communities, Backer summarizes four conditions, or principles, that must be met if research transfer activities are to bring about systemic change:

1. Individuals and organizations must be aware that the new knowledge exists and have access to it.
2. There must be credible evidence that the adoption of the innovation (i.e., new prevention program) will lead to improved practice without either excessive costs or undesirable side effects. (Prior success in transferring the technology may be the best evidence.) In particular, evidence is needed about the readiness of the

innovation to be transferred, the readiness of adopters and their communities to receive it, and the innovation's potential for continued success over time.
3. The money, materials and personnel needed to implement the new technology or practice must be available.
4. Active interventions are required to overcome resistance, fears and anxieties about change among the people who will need to implement the innovation. These must be coupled with efforts to develop user involvement or ownership in shaping the new technology or practice, and to reward individuals and groups for adopting the innovation.[31]

From these principles, Backer and colleagues developed the following six strategies:

1. *Interpersonal contact.* To get an innovation used in new settings, there needs to be direct, personal contact between those who will be adopting the innovation and its developers or others with knowledge about the innovation.
2. *Planning and conceptual foresight.* A well developed strategic plan for how an innovation will be adopted in a new setting, including attention to possible implementation problems and how they will be addressed, is essential to meet the challenges of innovation adoption and sustained change.
3. *Outside consultation on the change process.* Consultation can provide conceptual and practical assistance in designing the adoption or change effort efficiently and can offer objectivity about the likelihood of success, costs, possible side effects, and so forth.
4. *User-oriented transformation of information.* What is known about an innovation needs to be translated into language that potential users can readily understand and abbreviated so that attention spans are not exceeded, and made to concentrate on the key issues of "Does it work?" and "How can it be replicated?"
5. *Individual and organizational championship.* An innovation's chances for successful adoption are much greater if influential potential adopters (opinion leaders) and organizational or community leaders express enthusiasm for its adoption.
6. *Potential user involvement.* Everyone who will have to live with the results of the innovation needs to be involved in planning for innovation adoption, both to get suggestions for how to undertake the adoption effectively and to facilitate ownership of the new program or activity.[32]

Workforce Development

A concept is emerging in the health sector and the addictions field in response to the need to develop an adequate workforce to address current challenges. "Workforce development" offers opportunities for facilitating research transfer at organization and systemic levels. Advocates of workforce development stress that in order to develop an adequate workforce, a paradigm shift is required to refocus away from an exclusive orientation on training to one that addresses organizational development, change management, evidence-based knowledge transfer, and skill development.[33]

Workforce development is receiving increasing attention in Australia, New Zealand and the United Kingdom, where it is known as "workforce reform." Australia's national action plans on illicit drugs and alcohol identified workforce development as critical to sustaining the strategies of the plans.

Roche, who has written extensively on workforce development, states that its aims are "to improve the functioning of the entire AOD [alcohol and other drug] workforce by addressing the systems and structures that shape it."[34] Systems and structural factors include policies, funding, recruitment, retention and incentives. Methods of improving individual professional functioning include formal education, training, mentoring, on-the-job learning and best-practice guidelines.[35]

Workforce development offers opportunities for facilitating research transfer, implementing evidence-based practice, and bridging barriers at organization and systemic levels. For instance, the differing perspective of researchers and practitioners is a barrier to research transfer. To use workforce development to breach this barrier, one approach would be to provide the opportunity for the roles of researchers to converge. This would be a practical way to encourage dialogue and build relationships.

Knowledge Management

One reason organizations manage and share their knowledge is to transfer best, or exemplary, practices.[36] With this in mind, knowledge management holds potential for enhancing the research-to-practice exchange, both within and among organizations. Davenport and Prusak created the term "knowledge management" in 1995 to make sense of a number of trends that were emerging in business following the re-engineering processes of the late 1980s and early 1990s. Companies were starting to understand that through streamlining, they had eliminated people who held vital knowledge about the company, its people, processes and competencies. And coincidentally, the re-engineering trend was followed by the emergence of the World Wide Web and of corporate intranets containing project archives, documents and databases.[37]

The literature shows that the definitions of knowledge management vary in scope and focus;[38] however, the definition of knowledge management as "enhancing the use of organizational knowledge through sound practices of information management and organizational learning"[39] is relevant to this discussion. The knowledge management literature divides knowledge into two varieties: tacit and explicit. Explicit knowledge comes from books, documents, white papers, databases and policy manuals. Tacit knowledge is contained in people's minds. It includes general information, experiences and memories.[40]

Much of the explicit knowledge produced by organizations is "grey" or "fugitive" literature. These documents, such as program evaluations and policy discussion papers, are valuable for the development of policies and programs in the addictions field.[41] If organizations identify and organize the explicit knowledge they produce, they can more readily share this knowledge internally. They can also share it with other organizations,

through their website or through external databases that index the unpublished literature. These include the databases of the Canadian Centre on Substance Abuse; and the Virtual Clearinghouse on Alcohol, Tobacco and Other Drugs.

With respect to tacit knowledge, one author contends that the main function of knowledge management is the active management and support of expertise. And, since expertise is not easy to write down, knowledgeable individuals must be encouraged to pass their expertise to others through personal contact.[42] One mechanism to facilitate the sharing of tacit knowledge, such as expertise and experience, is referred to in the literature as "communities of practice" (CoPs).

Lathlean and Le May trace CoPs back to Lave and Wenger, who discussed the idea in relation to "group learning, knowledge, and the ways in which knowledge was used by a particular group to undertake an activity or solve a problem."[43] Similarly, Wright discusses CoPs as "informal networks of people engaged in a particular profession, occupation, or job function who actively seek to work more effectively and to understand their interests more fully."[44]

Southampton University in the United Kingdom is operating two research projects on the development of communities of practice. These projects define CoPs as "a group of people who may normally work together but who are acting and learning together in order to achieve a common task whilst acquiring and negotiating appropriate knowledge." One project focuses on better government services for older people. The other looks at outpatient dermatology services. These projects see the communities-of-practice model as having this potential advantage: the opportunity of working across agencies on issues that go beyond single-agency boundaries. In addition, the model allows for the development of a base of evidence on how knowledge and information are shared, used and valued in decision making and action planning between agencies, professional groups and consumers.[45]

The above examples involve face-to-face meetings. Electronic communication methods such as online threaded discussions and e-mail lists also have potential. For example, the American Health Information Management Association uses an online threaded discussion format to facilitate sharing of experience, feedback and information for the more than 90 CoPs it hosts on its website. The CoPs are designed to be self sustaining and member driven, and are organized around interests ranging from behavioural health to privacy rules.[46]

In the addictions field, communities of practice could be used in several ways to transfer research, both within and among organizations. For example, CoPs could be used within an organization as part of the implementation of a new program practice. Across agencies, CoPs could be used to encourage discussion around the release of a new best-practice document, or to discuss a response to an emerging policy issue.

E. Conclusion

What is the state of the addictions field with respect to research transfer and evidence-based practice?

To answer this question, it is useful to review what is known about facilitating the research-to-practice exchange. First, the literature stresses the importance of building relationships between researchers, practitioners and policy makers, and encouraging a circular exchange among these groups. Second, the literature indicates that to encourage groups such as practitioners and policy makers to consider adopting and implementing research-based evidence, research evidence summaries and practice guidelines must be combined with other methods, such as individual instruction, active-learning strategies, engagement of local opinion leaders, and provision of incentives. And third, several reviews called for funding bodies and research organizations to support research transfer at a level similar to the funding currently provided to research studies.

The literature also points to the need to consider organizational and systemic changes to enhance the research-to-practice exchange. The 1998 report of the US Institute of Medicine committee, *Bridging the Gap Between Practice and Research*, emphasized the need for "bi-directional" communication among policy makers, researchers and practitioners, but it also stressed the need for systemic change. The report stated: "Changing the system will require the three groups working together to ask and answer the right questions and to jointly commit to implementation."[1] When considering systemic and organizational change, workforce development offers opportunities for facilitating research transfer, implementing evidence-based practice, and bridging barriers at organization and systemic levels. And, finally, going back to Backer's definition of dissemination activities as "strategic efforts to get information about innovations—programs and best practices—out to individuals, organizations and communities,"[2] the phrase "strategic efforts" emphasizes the need to focus efforts at organizational and systemic levels.

Can researchers, practitioners and policy makers dance together? The RIPE model has potential to help them dance the waltz rather than the funky chicken. The model provides a framework for moving forward by demonstrating that policy and practice are determined by a complex and dynamic process that combines the influences of research and evaluation findings, ideological positions, political disputes and economic realities.[3]

The strategic directions identified at the recent Forum on Alcohol and Illicit Drugs Research also provide a framework for action.[4] "Research into knowledge exchange and dissemination" is one of the strategic directions forum participants identified. A review of research transfer activities in the addictions field, identifying current practices, gaps and opportunities, would be a useful next step.

In the addictions field, powerful forces are driving the movement for evidence-based practice. Within the last decade, government and funding agencies have pushed for improved efficiency, accountability and demonstrated effectiveness. As well, the growing

evidence base in the addictions field has raised the bar to do better-quality research. Better evidence is needed to meet the increasing expectations of government and funding bodies. All of these factors place demands for evidence-based practice and research transfer, challenging the field to move forward. These challenges are magnified by the fact the field is relatively small and fragmented and lacks the resources and research infrastructure of the medical field.

Finally, returning to the evidence-based medicine movement that has had such an influence over the past decade, how can the "best" aspects of evidence-based medicine be applied to enhance the research-to-practice exchange in the addictions field? While it will never be possible to translate research into practice in a way that specifies what should be done in every situation, the tools and concept of evidence-based practice can guide program and policy development, and can lead the way to strengthening evidence-based programs.

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Endnotes

Executive Summary

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