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Bridging Science to Service:

Using the Rehabilitation Research and Training Center Program

to ensure that research based knowledge makes a difference¹

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ABSTRACT

The challenge of bridging science to service is receiving increasing visibility in the health care field, with an emphasis on the use of evidence-based knowledge to influence change in both policy and practice. Since its inception over 40 years ago, the Rehabilitation Research and Training Center (RRTC) Program has provided grants to perform both research and training activities designed to insure that the research knowledge generated is translated into the field of practice. The RRTC program is unique in that its mission and funding has always included the requirement that both time and dollars be invested to ensure that research generated knowledge be translated and disseminated to users in the field, such as decision makers and practitioners. The Center for Psychiatric Rehabilitation has been an RRTC for over 25 years, and provides a living example of the impact of the RRTC program in bridging science to service. Its mission as an RRTC has been to develop and transfer research knowledge to both decision makers and practitioners who can act on this knowledge to inform change and promote progress in mental health disability policy and practice. This article overviews five basic dissemination and utilization principles that guided the Center in overcoming the most common barriers to effectively bridging science to service, and provides examples of the Center's activities related to each principle. In addition, a knowledge transfer framework developed by the Center to organize dissemination and utilization efforts is described.

Key words: Evidence based messages, Knowledge dissemination, knowledge utilization, knowledge transfer framework, psychiatric disabilities, rehabilitation, recovery.

Bridging Science to Service: Using the Rehabilitation Research and Training Center Program

The challenge of getting research generated knowledge used by decision makers and practitioners has been increasingly noted in the health care field in general {1-3} including the field of mental health {4-7}. Given the over use, under use and misuse of research information by health care providers, managers and decision makers {8} there have been widespread calls through reports in the U.S., such as that of the New Freedom Commission {8} and the Institute of Medicine's {9} among others, to rethink common strategies used to bridge the gap between "what is known" and "what is done" {1, 10, 11} There is an emerging recognition in the field that overcoming this gap involves a complex and dynamic process of knowledge transfer {12-16}. Knowledge transfer (KT) has been defined as a "process of exchange, synthesis and ethically sound application of knowledge within a complex system of relationships among researchers and users." {17}. The components of KT have typically been thought to include a method of identifying quality information (including systematic reviews, evidence grading, syntheses); program development or adaptation of the content; program implementation, evaluation of knowledge utilization and implementation of strategies for sustainability {16-19} Concerted efforts to transfer research knowledge to the field have recently become more widespread. The activities involved have ranged widely, from undertaking the evaluation of a body of evidence in a particular domain (e.g. Supported Housing, {20}; grading Mental Health Program evidence ; {21} focusing on the development of toolkits to promote the sustainability of a specific group of evidenced based practices {22}; the establishment of state funded centers to specifically promote the implementation of identified evidence based practices (e.g. Ohio's eight

Coordinating Centers of Excellence, Michigan's Practice Improvement Steering Committee, {21}).

Despite these emerging efforts, many of the obstacles that created the gap between science and service (e.g. lack of congruence between dissemination and utilization strategies and their intended goals, lack of planning and resources allocated to overcoming the gaps; existence of 'two [separate] communities': researchers and users) identified more than thirty years ago {23-25} persist in current practice {6, 26, 27}. For example, a recent study by Landry, Lamari and Amara, {15} indicated that 53% of Canadian government officials surveyed indicated that research results rarely or never influenced their policymaking decisions. Similar findings have been identified in other studies {28}, including those in other countries {29}.

In attempting to develop "evidence based" or "evidence informed" decision making {30}, policy makers and administrators have turned to a variety of researchers and academics {3}. At least 33 states have recently initiated partnerships with the major universities and private colleges in their state, to support the implementation of specific evidence based practices primarily through evaluation and training activities {21}. The National Institute of Mental Health (NIMH) instituted the Research Infrastructure Program {31} to expand the number of partnerships between community-based, clinical/services settings and academic institutions in order to enhance the national capacity to provide evidence-based mental health care in community settings. However, many universities and research institutions still do not themselves place a high priority on conducting a planned process of KT {32} from the generation of research and research syntheses to the implementation of the implications of the innovation or research findings. Knowledge transfer activities still tend to be the least funded activity within research grants, often making them an "afterthought" rather than a planned component {33, 34}.

Since most researchers are professionally rewarded (i.e. promotions and tenure) based on publications in peer-reviewed journals, {32, 35}, the transfer of research findings may be targeted to a narrow audience of professionals. This can result in inadequate communication of the findings for the practice field (e.g. publishing in journals read only by researchers or using language poorly understood by constituents beyond the research community) {35, 36}. In addition, the lack of incentives appears to result in many researchers having little training or experience with KT strategies and techniques {32}. This lack of planning is often compounded by the great lag in time between identifying findings, journal publication of the research and their translation into usable products. These limitations make it difficult for the information, once published, to be responsive to current circumstances {37, 38} and therefore reduce the credibility of researchers in the eyes of decision makers {39}. Effectively bridging science to service is facilitated by some level of understanding between the communicator/researcher and the specific stakeholder/user in order to ensure that the knowledge itself is a fluid interactive set of understandings shaped by both those who originate it and by those who receive it, including issues such as stakeholder motivation and socio cultural differences that can effect decision makers' implementation of innovation. {40-42}.

The challenge of ensuring that research based knowledge makes a difference is, therefore, developing critical information based in evidence that can be effectively conveyed to decision makers and others, using knowledge transfer strategies that overcome these hurdles. A very early and ongoing response to this science to service or knowledge transfer in the disability field has been the university based Rehabilitation Research and Training Center program.

Combining Research and Training Expertise in One Organization

The Center for Psychiatric Rehabilitation at Boston University, an RRTC, is unique as a research organization in mental health in that its mission and funding has always included the requirement that both time and funding be invested to ensure that research generated knowledge be translated and disseminated to users in the field, such as decision makers and practitioners. The Center's development as a RRTC in Psychiatric Rehabilitation was originally and funded through the cooperation of NIMH and the Rehabilitation Services Administration (RSA), and now exists as a collaborative effort between the Center for Mental Health Services (CMHS) and the National Institute on Disability and Rehabilitation Research (NIDRR). Center researchers work in concert with Center experts in dissemination/utilization to achieve the goal of "bridging science to service".

The overall RRTC program was initiated in 1962 with to conduct rehabilitation research, train personnel in rehabilitation and support dissemination and utilization of research findings and products {43}. Currently the NIDRR program funds 34 RRTCs in a wide variety of disability areas (<http://www.ncddr.org>).

Principles of Evidence Based Messaging

The RRTC at Boston University, the Center for Psychiatric Rehabilitation (Center), has coined the term "evidence based messaging" (EBM) to characterize attempts to insure that results generated by researchers become "take home" messages that impact decision makers, administrators, and practitioners who have the power to act on them. The Center's efforts have been guided by the early and ongoing dissemination and utilization literature, examples of which have been previously referenced. This paper describes 5 principles of evidence based messaging (see Table 1), using examples from the Center's more than 25 years of experience as an RRTC in using these principles to transfer evidence based messages to practice.

Insert Table 1 about here

Principle 1. Develop evidence-based messages that are based on a body of research, rather than on single data sets.

In contrast to dissemination of data from a single research study, evidence-based messages are the critical ideas that emerge out of a body of research knowledge. Furthermore, these messages are framed to influence decision makers. Decision makers are not apt to be influenced by the size of regression coefficients or the significance levels in individual studies {16}, but by critical ideas presented as a simple message that is designed to inform their decision-making. Table 2 provides examples of evidence based messages based on research done by the Center and/or other researchers in the field. Center researchers reviewed research results around a particular topic or question in order to determine if a simple theme or message emerged from the results. Next the Center's technical assistance experts, working together with the Center's researchers, helped frame each message in a single sentence.

Insert Table 2 about here

Each of the message examples in Table 2 can be further elaborated by a review of the underlying data. For example, the evidence based message on the failures of the mental health system with respect to rehabilitation outcomes (EBM # 1, Table 2) was regularly detailed fifteen to almost thirty years ago in several articles and book chapters {44-47} In summary, the evidence specified that the base rates for rehabilitation outcomes for people with severe mental

illnesses were very poor (e.g., less than 25% working competitively, state hospital recidivism of 40-50% in the first year).

While decision makers who are transforming their mental health system to include more of a rehabilitation perspective may be comforted by knowing about numerous research studies, the essence of the body of research must be framed in a straight forward, succinct way for it to be potentially effective. In EBM # 1 concerning rehabilitation outcomes, the implication of the EBM for system leadership was that that the system clearly needed to be redesigned if rehabilitation outcomes were to be improved. Decision makers need the ideas and knowledge that emerge from the data rather than all the empirical details {28, 40}. Even then, however, the evidence based message will only be useful to the extent to which it can be applied within the constraints and incentives of a decision maker's environment {16}.

Researchers and technical assistance experts who develop evidence-based messages from research data must examine the data they themselves generate, data from other mental health studies, as well as studies from related fields. An EBM is information describing a theme generated by a variety of sources of data. Systematic reviews, meta analyses and registries of evidence based guidelines are currently all methods of developing information syntheses {1, 10, 48}. Such syntheses are often conducted by research utilization committees and interdisciplinary consensus panels (e.g. <http://www.campbellcollaboration> or <http://www.cochranecollaboration>). An RRTC has the infrastructure and the internal resources needed to conduct reviews and syntheses {49}. For example, another important evidence-based message the Center promoted to decision makers, is that people with psychiatric disabilities must have the opportunity to choose their own rehabilitation goals (EBM # 2, Table 2). In formulating this evidence-based message, Center interdisciplinary staff were guided not just by the experimental, laboratory

research on goal setting by Locke and his colleagues {50}, but also by existing mental health research {44, 51-55}. When all the goal setting studies were examined, a theme emerged about how setting one's own goals can improve satisfaction, performance and perseverance.

The current NIMH initiative on translational research {31} presupposes that behavioral science research conducted on non-mental health participants is significant to mental health services research. The previously cited research of behavioral scientists on goal setting is but one confirmatory example of the wisdom of this translational research initiative. "Take home" messages must be based on conclusions derived from research across the available literature in both the primary field of study but also in related fields as well.

Evidence based messages are succinct statements that are substantiated with research data and are designed to imply a direction, but not specific policies and procedures for policy makers and practitioners to follow. An example of an evidence based message suggesting direction but not one precise action is EBM # 3 (Table 2) about the limitations of the psychiatric diagnostic system, and specifically the poor correlation between a person's skills and symptoms (EBM# 4, Table 2). These particular evidence based messages infer the necessity of change for those state Directors of Vocational Rehabilitation who often spend considerable dollars on psychiatric assessments and psychological testing for the purpose of diagnostic clarity and/or rehabilitation planning. However, they do not indicate a particular policy or procedure around psychiatric assessment.

Still to be developed are standards that can rate the research rigor and meaning of the individual studies that contribute to an evidence based message. Numerous attempts at developing standards for research on various *interventions* in healthcare, education and mental health currently exist (e. g., the Cochrane Collaboration, the Campbell Collaboration, the

Department of Education's What Works Clearinghouse, and the National Registry of Evidence-Based Programs and Practices). Existing standards seem to be in a constant state of refinement {9} For example, current standards do not usually include the element of the meaningfulness of the research information to various stakeholders {56}, despite the fact that the meaningfulness of the information is clearly important to the likelihood of use of the information {57, 58}. The Center is in the process of developing such standards for disability research through a five year NIDRR grant on knowledge dissemination. Efforts within the same Center project are also underway to identify standards for observational and correlational studies that are more frequent in the disability and rehabilitation field than are randomized clinical trials {56}. In addition to the emergence of standards for observational and correlational studies, standards for rating intervention research may be giving way to current suggestions for researching change processes and treatment principles {59-62}, which is more in line with the notion of evidence based messages.

Principle 2. Build credibility with decision makers as a legitimate developer of evidence based messages.

Whether we as scientists like it or not, the credibility of the messenger affects the impact of the message. If an individual or an organization is to play a role in delivering evidence based messages, then it must be viewed as a credible source by decision makers. Credibility is one of the hallmarks of innovation {40, 63}. Credibility is earned over a period of time, however, which explains in part why innovations take a significant time to be accepted {40, 64}. Furthermore,, credibility is constantly assessed by the field so that it is not a static characteristic but one that must be achieved on an ongoing basis {39}.

To build knowledge development and knowledge transfer credibility, an organization must demonstrate organizational capability { 14, 16}. In the mental health research field the recognized method for meeting the criteria of capability and credibility is successful peer review of submitted articles and grant proposals. In addition to publishing data about individual research projects, performing seminal reviews of selected topical areas are significant in establishing credibility. For example EBM # 5 and 6 stating that psychiatric rehabilitation's process, outcomes, values and principles can be successfully described, taught and delivered as an effective service, has been periodically reviewed for over two decades by Center researchers in textbooks {44, 65}, book chapters {45}, and journal articles {66, 67}.

While there is no substitute for meeting the requirements of peer review as a means to establish research credibility, the Center realized early on in its existence that we must also earn credibility in the knowledge transfer process if we wished to play a significant role in impacting decision makers. As an academic research organization, we were in danger of being perceived as simply an ivory tower research organization, out of touch with the clientele the research knowledge was designed to help, a common perception of research organizations {3, 17} and cultural needs of patients and providers and to the feasibility concerns of the community organizations involved.

The Center decided to develop two streams of experience with which to counteract this perception. First, training and technical assistance experts on staff worked with mental health agencies to implement new research generated knowledge in the context of the normal daily struggles encountered in mental health practice. As Jacobson, Butterill and Goering (2005) point out, knowledge transfer focused consulting is a powerful tool for effective transfer of research information to decision makers. Second, innovative services, such as supported education (EBM

#7, Table 2), were developed, conducted and evaluated at the Center's research site {68, 69}.

By providing these two experiential components, our researchers and technical assistance experts have had an opportunity to interact regularly with service recipients as well as providers and administrators, as well as expanding our staff with recruits from these same groups.

To build credibility among policy makers, one must also identify the decision makers who influence policy. In the mental health field, the policy level decision makers are primarily the state leaders in mental health and rehabilitation, local exemplary organizations, government funding bodies, elected officials and their staff, other researchers with a publishing and funding track record, and now more than ever advocacy organizations, including groups of people with psychiatric disabilities and their families, all of whom may have very different information needs. Once the decision makers are identified, credibility is built by listening to the decision makers and understanding their specific concerns, by building research projects relevant to these concerns, and in essence by following their lead {16, 65}. An organization attempting to build credibility must attend decision makers' conferences, engage them in ongoing communication through visits, phone and now electronically. Leaders of these constituencies must be invited to sit on advisory boards, and participate as consultants or staff to individual research projects {70}.

Decision makers from one constituency will be able to advise the research organization about issues faced by other constituencies, and facilitate access to other decision makers. For example, the Center's early research on the relationship between vocational outcome and people's, skills, symptoms, diagnoses and demographics (EBM #3, 4, 8, Table 2) was introduced to the Social Security Administration and the Mental Health Law Project (now the Bazelon Center) through the intervention of a Center Advisory Board member representing NIMH. As a result, Center researchers testified in several class action lawsuits about the relevance of this body of grant

supported research to SSA's disability determination revisions {71}, influencing a revision in their disability determination procedures for people with severe mental illnesses {72}.

Principle 3. Develop knowledge transfer expertise and infrastructure within the research organization.

An organization looking to provide effective, ongoing knowledge transfer activities must plan their activities with the requisite knowledge transfer expertise and an infrastructure of technology, support and resources. As the Center's researchers are housed within a university setting, knowledge transfer is a compatible and expected activity. However, we have found that most researchers in academia have neither the time, nor the skills, nor the interest in this activity, nor should they, as that is not their defined role or training. As indicated previously, as an RRTC, most of the Center's grant supported research projects included funding for dissemination of the research. This funding has allowed us to hire experts in knowledge transfer. As the Center developed expertise in knowledge transfer, we published both research and conceptual articles on issues related to the application of research knowledge {12, 73, 74}, which in turn increased the Center's credibility in the knowledge transfer field.

An important part of the infrastructure needed for knowledge transfer is the development of electronic media. An interactive web site is almost a requirement for an organization attempting to influence decision makers. As a research organization attempting to bridge science and service, the Center has invested in a Web expert whose major responsibility is web design and maintenance. The Center's website, located at www.bu.edu/cpr, currently hosts an average of 9,000 unique visitors per month. This website was recognized as a "web site worth watching" in *Psychiatric Services* journal {75}. A monthly *Mental Health and Rehabilitation eCast* that

contains information on current research projects and knowledge transfer activities is emailed to over 5,500 subscribers.

Effective knowledge transfer however must appeal not only to formal decision makers but also to a variety of influential constituencies who need to know, understand and use the research information (e. g., consumers, families, educators, providers etc) {12}. Not all of these audiences regularly use the Web as a primary means of information. Consequently, expertise and infrastructure must support traditional print (e.g. fact sheets, brochures) and face-to-face interactions (e.g. consulting, training seminars, workshops). When a research organization that engages in EBM hires an in-house expert in materials design and production, as the Center has, the specific materials needed to facilitate knowledge transfer (books, tapes, videos, etc.) can be designed more quickly, inexpensively and with direct input from the researchers who studied the topic area and the constituents who will be using the information.

Principle 4. Convey evidence-based messages using an organized approach to achieve targeted outcomes.

In addition to creating the message itself, and building organizational credibility and expertise, this principle indicates that a research organization must use an organized, planned dissemination approach that specifies the outcome goals, strategies, target audiences that are expected by the communication of the evidence based message. A lack of clarity about the congruence between the methods used and the expected information outcome has been one of the reasons cited for the gap between health services research and community based practice {38, 76}. Research has demonstrated that simply making information available to decision makers will not necessarily result in a change in practice {1}. Difficulties in changing practice stem rather from issues such

as inadequate legislative, funding and socio-political structures to support an innovation {16, 65, 77, 78}.

To implement this principle, the Center has developed a framework for the types of goals that organizations can expect and the knowledge transfer strategies that stem from them. The 4E framework of dissemination and utilization {12} clarifies what effects an organization might expect from common knowledge transfer strategies. In other words, the knowledge transfer strategy employed flows out of the type of goal or outcome the organization is attempting to achieve. The 4E framework, presented in Table 3, was developed in order to overcome the difficulties of knowledge transfer noted earlier, i.e., the confusion between goals and strategies, the lack of a planned approach to the transfer of research information and the lack of interaction in knowledge transfer methodologies between users and researchers.

Insert Table 3 about here

The 4E's reflect the complexity of knowledge transfer. The strategies include *Exposure*, *Experience*, *Expertise* and *Embedding*. *Exposure* and *experience* (i.e. dissemination) strategies are designed to spread or promulgate new information to assure that individuals are knowledgeable and have positive attitudes towards the information content. These strategies include *exposure* related activities such as the traditional, more passive methods of dissemination including journal or popular articles, conferences or lectures {42}, as well as newer methods, such as web strategies, based on an active, information seeking paradigm {79}, The information seeking paradigm see users as exploring, learning, analyzing and confirming information, rather than just reading it. *Experience* related activities are aimed at changing attitudes which limit the

implementation of innovations to practice {5, 80, 81}, and include the use of role models who provide the opportunity to discuss proposed innovations with peers. An experienced mentor can inculcate a sense of hopefulness about the possibility of change that is not present when users are simply provided with new information {82, 83}.

Expertise and *Embedding* (i.e. utilization) strategies are designed to translate the new information into organizational and personnel structures in such a way as to assure the expert application of the information in daily practice, and embed the practice. *Expertise* activities, such as intensive training programs with supervised practice to build competence, are a step toward precise performance and predictable outcomes {76}. Supervised practice is often forgotten in attempts to create expertise. For example, toolkits or curricula that describe competencies and implementation strategies do not produce expertise without the input of a supervisor or mentor to provide feedback on the implementation effort {84}. The Center developed a series of practitioner training curricula to support such supervisors or mentors in developing expertise in the psychiatric rehabilitation approach {83, 85, 86} a promising practice developed by the Center knowledge transfer specialists and researched over a thirty year period {87}. *Embedding* strategies require complex knowledge utilization methods, to achieve a goal of increased use of the new findings or innovation. This need to institutionalize knowledge in daily practice has long been recognized as one of the most difficult aspects of knowledge transfer and is indeed the lynchpin of bridging science to practice {14, 16, 30, 76}. *Embedding* includes activities such as technical assistance or consultation, typically over a lengthy period of time. These activities can assist organizations to : develop structures that support the use of the evidence based message {14, 30, 74}; develop rules and legislation supporting the evidence based message; develop public policy strategies that strengthen social norms and expectations

related to the evidence based message {88}; or develop resources to sustain the changes over time, such as funding for the evidence based message {76}. The “4E’s” framework can be used categorically, that is for the purpose of generating strategies for one knowledge transfer goal only (e.g., *expertise*) or it can be used in a more comprehensive effort to develop strategies across two or more goals (e.g. *expertise* and *embedding*).

The strategies to achieve each goal are designed for specific groups of decision makers (see Table 3). Strategies can be developed to reach each decision maker group in order to increase that group’s knowledge, positive attitudes, skills or institutionalized use of the evidence based message. For example, to transfer the messages that people with severe mental illnesses can recover (EBM # 7, 8, 9, Table 2); the Center has used multiple strategies toward multiple outcomes. In terms of a simple *exposure* strategy for this message, the Center has used the interaction provided by the web, presentations and workshops, to repeatedly communicate to researchers, family members and practitioners that long term follow-up studies demonstrate that recovery from severe mental illnesses occurs often {89}. The Center uses the collection and sharing of real stories of people’s recovery {90} as an *experience* method to reinforce the attitudes of people with psychiatric disabilities themselves, about the possibilities of their own recovery. At an *expertise* level the Center has developed training materials to help people with mental illnesses and their service providers be more skilled at facilitating the recovery process {82, 83, 86, 90, 91}, so that program administrators can more easily incorporate recovery oriented programming into their sites. At the *embedding* level the Center has provided on site technical assistance to policy makers to design mental health programs and systems to become more recovery oriented {60, 92}.

Such experiences have underlined the need for knowledge transfer experts to spend time on-site for a significant period of time, in personal contact with those involved in the implementation of an innovation in order to ensure that many of the EBM's become embedded. Demonstrations, individualized feedback and modifications must be made in real time and face to face, if embedding is to be successful. For example, based on the evidence underlying EBMs # 5, 6 and 10, the Center's technical assistance experts used expertise and embedding strategies with a local agency who had received federal supported housing funds to install a supported housing program using the technology of the Center's psychiatric rehabilitation approach {83, 85, 86, 93} . Evaluation of the program indicated that the service recipients, a majority of whom had at one time been homeless and abused drugs, increased significantly their community living days and their homelessness was eliminated {94} . However, work outcomes were minimally affected, so a new research based program of supported employment was added to the supported housing program, with combined support from the state Division of Vocational Rehabilitation and the state Office of Mental Health Services. Evaluation of this project evidenced an employment rate of 47% for the service recipients of this combined program {66}.

Principle 5. Routinely evaluate efforts at EBM.

Ensuring ongoing relevance requires various forms of interaction with information users. One such type of interaction is the evaluation of changes brought about by knowledge generation and transfer, something that is not regularly evaluated in most research projects. Because the Center has been funded, however, to both generate and transfer knowledge, we have been able to attempt this task through the use of two major strategies: collecting direct and indirect evidence of impact.

Direct evidence: For some knowledge transfer outcomes we have been able to track the effect of our research and related technical assistance through follow up surveys of information users and logging unsolicited feedback. We have evaluated our efforts in terms of tracking “outputs”, “utility” and “outcomes”, using a framework developed by NIDRR, one of our main federal funding sources {95}. Outputs are the direct products or results of our 4 E strategies. Utility is the perceived usefulness of these outputs. Outcomes are the considered to be the impact of these outputs. For example, over a five year period from 1999-2004, the Center tracked and reported on these evaluation components {49}. Center outputs included training over 45,000 personnel in recovery, community support and rehabilitation topics including research results and implications of research results supported by Federal funds. In another example of tracking outputs over the same period, the Center tracked use of the website. Data revealed that over 839,193 pages were viewed in the period of October 2002-September 2003. An average of 7190 unique individuals per month visited the website viewing 6 -7 pages per visit over the period between 1999 and 2004.

These output data, however, only provide a gauge of the degree to which the target audiences are exposed to EBM. The extent to which the target audiences view the output as useful or perceive its utility, is a key link between communicating the information and the eventual embedding of the information {40, 78}. In addition to training evaluations done immediately after each training event, follow up surveys were sent between 3 and 6 months after participation in a short-term dissemination or utilization strategy. One such survey was sent to a sample of 1035 individuals randomly selected from lists of those who had participated in a training workshop, conference, web cast or seminar at the end of one funding cycle {49}. In addition to the initial message, two reminders were sent over a period of two weeks. 168 individuals

responded (16.2%). In addition, 500 individuals who had purchased some form of Center material (e.g. article, book, manual, multi media package) were likewise surveyed; 85 individuals responded (17%). The survey asked questions about the utility of the event/materials to the participant's daily work. Each question was answered using a three point scale (i.e. Very Useful, Somewhat or not at all Useful). The information was collected by web form using tab delimited data files. Alternative formats were provided for those who had difficulty using the web form. Only 3 individuals expressed difficulty (.02 %). Seventy – one percent of the respondents who had participated in Center workshops, web casts, and conferences reported that the experience proved to be very useful. The participants were also asked about identifiable ways in which the information was helpful. For example, 32% of the responses reported using the information received in subsequent meetings projects, grants, papers; 18% used it in program development; 20% used it to teach other staff, students, peers; 30% used it to help in re-evaluating their own philosophy, or as a way of interacting with others in their direct service provision.

Outputs with respect to a specific evidence based message can also be evaluated. For example, a supported education program implementation manual related to EBM# 7 and 10 was written to assist organizations in embedding supported education into their programming.

Within two years, 15 program sites reported using the manual to implement their own programs.

When directly surveying decision makers about the Center's influence on their actions, the actual behavior change of course depends on the person's role. For clinicians, the change in behavior may be using different practice guidelines. For an advocacy group it may be communicating the message in an action format to their constituencies. For a legislator, it may be crafting new laws. For policy makers it may be creating new funding streams. For program

administrators it may be rewriting their program policies and procedures. For researchers, it may be investigating additional hypotheses.

Indirect evidence: Evidence-based messages are relatively easy to track through indirect evidence as well. For example, the value placed on Center information can be evidenced by looking at the number of times Center researchers are cited by other authors, as well as more wide spread changes in the field and the Center's inferred role in helping to bring about these changes. Other organizations in the field acknowledge the Center's website as a resource and confirm the value of the Center's information by linking to the site. A search conducted in November 2005, found more than 100 organizations, associations, and research centers that link their websites to the Center's website.

As an example of tracking the role a research organization plays in more widespread change, Center research demonstrated the need for supported education {96} and its positive impact on individuals who receive such services {69}. The Center is generally attributed to be one of the main founders of the supported education service model{97}. In Massachusetts, the State Department of Mental Health then contracted with Center technical assistance experts to demonstrate the service around the state {98}, and later embedded supported education in state regulations and funding {93}. More recently, CMHS came to believe that supported education was important enough to its efforts at transforming the U.S. mental health system that it funded the development of implementation toolkits on supported education {22}. Another example on both the state and national level is the Center's repeated communication about the facts of recovery from severe mental illnesses (EBM # 9, Table 2). Currently, at least 39 of the states have adopted a mission statement or policy about the potential of consumers to recover {21}. In another example, the Center developed and evaluated a structured psychiatric rehabilitation

process for helping consumers choose, get and keep the roles they prefer {44, 65, 87}. In addition to being implemented in numerous programs in over twenty countries around the world, this process was recently nominated to be one of Oregon's approved evidence based practices. Furthermore, it was selected as the process used to train Fellows in the Veteran's Administration's national Psychosocial Fellowship program. Lastly, working collaboratively with others communicating the same message, the Center's EBM seems to have played a part in variety of these states' adoption of recovery as their guiding vision {99} as well as that of entire countries such as the U. S. {7} and New Zealand {100}. However, the notion of indirect impact remains difficult to empirically evaluate, and may be seen as more of a yearning than a reality. Research needs to be done in the future to further understand the role of EBM in complex system level transformation.

Conclusions

There is a reason that the bridging of science to service doesn't routinely occur—it is difficult to do and cannot be an under funded afterthought to the research endeavor. Furthermore, the knowledge transfer process requires constant innovation in order to remain a relevant, active contributor to the field. The new knowledge developed may well pose direct challenges to accepted ideas and practices (e.g. the recovery vision) as well as require EBM's to reach new stakeholders. Thus effective EBM requires ongoing dialogue among researchers, knowledge transfer experts and varying groups of decision makers, as well as requiring multiple evaluations of existing information to continually develop relevant new messages and overcome shifting challenges to the implementation of new findings. This dynamic process can be best delivered by organizations mandated to do both research and knowledge transfer.

Such organizations need to have the capacity to develop long term relationships of trust with decision makers in order to identify new areas of needed knowledge, overcome potential resistance and influence practice. In addition to longevity, they also need flexibility to make the kind of changes in research and KT strategies that may be required as the implications of new findings become clear. Using the five principles of knowledge transfer, dissemination and utilization activities must be planned as part of the research process, carried out by credible experts in knowledge transfer, separately funded and evaluated. Through over 25 years of funding as a Rehabilitation Research and Training Center, the Center for Psychiatric Rehabilitation has been one of the few university based mental health research centers specifically funded to bring science to the field of practice. As reported here, the Center's experience and knowledge gained from the use of dynamic and constantly adapted bridging activities has resulted in the development of guiding principles and suggestions for understanding different ways research organizations may contribute to bridging science to service.

References

1. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *The Lancet*. 2003;362:1225-30.
2. Innvaer SG, Vist E, Trommald M, Oxman AD. Health Policymakers' perceptions of their use of evidence: A systematic review. *Journal of Health Services Research and Policy*. 2002;7(4):239-44.
3. Moynihan R. Using health research in policy and practice: Case studies from nine countries. New York: Academy Health/Millbank Memorial Fund; 2004.
4. Amador XF, Fitzpatrick M. Science to services: Consumers need "real-world" science. *Schizophrenia Bulletin*. 2003;29(1):133-7.
5. Corrigan PW, Steiner L, McCracken SG, Blaser B, Barr M. Strategies for disseminating evidence-based practices to staff who treat people with serious mental illness. *Psychiatric Services*. 2001;52:1598-606.
6. Institute of Medicine. Improving the quality of health care for mental and substance-use conditions. Washington DC: The National Academies Press; 2006.
7. New Freedom Commission on Mental Health. Achieving the promise: Transforming mental health care in America. Final report. DHHS Pub. No. SMA-03-3832 Rockville, MD; 2003.
8. Walshe K, Rundall T. Evidence -based management: from theory to practice in health care. *Millbank Quarterly*. 2001;79(3):429-57.
9. U.S. Department of Education. Institute of Science. What Works Clearinghouse. Retrieved 6/2/2005 from www.whatworks.ed.gov/

10. Choi BC. Understanding the basic principles of knowledge translation. *Journal of Epidemiology and Community Health*. 2005;59(2):93.
11. Davis DA, Thomson MA, Oxman AD, Haynes RB. Evidence for the effectiveness of CME. A review of 50 randomized controlled trials. *Journal of the American Medical Association*. 2003;268:1111-7.
12. Farkas M, Jette AM, Tennstedt S, Haley SM, Quinn V. Knowledge dissemination and utilization in gerontology: An organizing framework. *Gerontologist*. 2003;43(Special Issue 1):47-56.
13. Hoge MA, Paris Jr. M., Adger Jr. H., Collins Jr. F.L., Finn CV, Fricks L, et al. Workforce competencies in behavioral health: An overview. *Administration and Policy in Mental Health*. 2005;32(5/6):593-627.
14. Jacobson N, Butterill N, Goering P. Consulting as a Strategy for Knowledge Transfer. *Millbank Quarterly*. 2005;83(2):299-321.
15. Landry R, Lamari M, Amara N. The extent and determinants of the utilization of university research in government agencies. *Public Administration Review*. 2003;63(2):192-205.
16. Lavis JN, Robertson D, Woodside JM, McLeod CB, Abelson J. How can research organizations more effectively transfer research knowledge to decision makers? *Milbank Quarterly*. 2003;81(2):221- 48.
17. Canadian Institutes of Health Research. *Canadian Institutes of Health Research Knowledge Translation Strategy: Niche and Focus 2005-2009*. Ottawa, Canada; 2004.
18. Jacobson N, Butterill D, Goering P. Development of a framework for knowledge translation: Understanding user context. *Journal of Health Services Research and Policy*. 2003;8(2):94-6.

19. National Center for the Dissemination of Disability Research. Overview of international literature on knowledge translation. *Focus*. 2006;14:1-6.
20. Rog DJ. The evidence on supported housing. *Psychiatric Rehabilitation Journal*. 2004;27(4):334-44.
21. National Association of State Mental Health Program Directors. State mental health agency implementation of the six new freedom commission goals: 2006: State mental health agencies (SMHAs) are making substantial progress toward achieving the major goals of the commission. NASMHPD Research Institute. 2006;6(1):1-6.
22. Substance Abuse and Mental Health Administration. Evidence based practices: Shaping mental health services toward recovery. Retrieved 11/1/06 from, <http://mentalhealth.samhsa.gov> 2006.
23. Caplan N. The two communities theory and knowledge utilization. *American Behavioral Scientist*. 1979;22(3):459-70.
24. Hamilton LS, Muthard JE. Research utilization specialists in vocational rehabilitation (Monograph). Gainesville, FL: Rehabilitation Research Institute; 1975.
25. Switzer ME. Research and demonstration grant program (revised). Washington, D. C.: Vocational Rehabilitation Administration, U. S. Department of Health, Education, and Welfare; 1965.
26. Backer TE. The failure of success: Challenges of disseminating effective substance abuse prevention programs. *Journal of Community Psychology*. 2000;28(3):363-73.
27. National Advisory Mental Health Council. Clinical treatment and services research workgroup: Bridging science and services. Rockville, MD: National Institute of Mental Health; 1999.

28. Whitford H. Can research influence mental health policy? Australian and New Zealand Journal of Psychiatry. 2001;35:428-34.
29. Smith CS. The impact of research on decision-making by practitioners and managers. Unpublished manuscript. Reviewed in NCDRR Focus. 2001;14.
30. Rosenheck R. Organizational process: A missing link between research and practice. Psychiatric Services. 2001;52:1607-12.
31. National Institute of Mental Health. Research Infrastructure Program . Retrieved 11/01/06 from: <http://www.nimh.nih.gov/grants/r24.cfm>
32. Jacobson N, Butterill, D., Goering, P. Organizational factors that influence university-based researchers' engagement in knowledge transfer activities. Science Communication. 2004;25(3):246-59.
33. Duffy M. The internet as a research and dissemination resource. Health Promotion International. 2000;15(4):349-53.
34. Scullion PA. Effective dissemination strategies. Nurse Researcher. 2002;10(1):65-77.
35. Prochaska J, Peters KE, Warren JS. Health behavior: From research to community practice. In: Albrecht G, editor. The handbook of social studies in health and medicine. London: Sage Publications; 2000. p. 359-73.
36. Dobbins M, Cockerill R, Barnsley J. Factors affecting the utilization of systematic reviews. International Journal of Technology Assessment in Health Care. 2001;17:203-14.
37. Bradley EH, Webster TR, Baker D, Schlesinger M, Innouye SK, Barth MC, et al. Translating research into practice: Speeding the adoption of innovative health care programs. Commonwealth Fund Issue Brief. 2004;July.

38. Morrissey E, Wandersman A, Seybolt D, Nation M, Crusto C, Davino K. Toward a framework for bridging the gap between science and practice in preventions: A focus on evaluator and practioner perspectives. *Evaluation and Program Planning*. 1997;20:367-77.
39. Jacobson N, Goering, P. Credibility and credibility work in knowledge transfer. *Evidence & Policy: A Journal of Research, Debate and Practice*. 2006;2(2):151-65.
40. Greenhalgh T, Robert G, MacFarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: Systematic review and recommendations. *Millbank Quarterly*. 2004;82(4):1-33.
41. King L, Hawe P, Wise M. Making dissemination a two-way process. *Health Promotion International*. 1998 Sep;13(3):237-44.
42. Rogers EM. The challenge: Lessons for guidelines from the diffusion of innovations. *Journal on Quality Improvement*. 1995;21:324-8.
43. Hayward B, Adelman N, Tashjian M. Assessment of the Rehabilitation Research and Training Centers Program. Report for Rehabilitation Services Administration. Washington, D.C.: Policy Studies Associates; 1988.
44. Anthony WA, Cohen M, Farkas M. *Psychiatric rehabilitation*. Boston, MA: Boston University Center for Psychiatric Rehabilitation; 1990.
45. Anthony WA, Cohen MR, Cohen BF. *Psychiatric rehabilitation*. In: Talbot JA, editor. *The chronic mental patient: Five years later*. New York: Grune & Stratton; 1984. p. 137-57.
46. Anthony WA, Cohen MR, Vitalo R. The measurement of rehabilitation outcome. *Schizophrenia Bulletin*. 1978;4(3):365-83.

47. Anthony WA, Nemece PB. Psychiatric rehabilitation. In: Bellack AS, editor. Schizophrenic treatment, management, and rehabilitation. Orlando: Grune & Stratton; 1984. p. 375-413.
48. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W. Lost in knowledge translation: Time for a map? *The Journal of Continuing Education in the Health Professions*. 2006;26(1):13-24.
49. Farkas M, Rogers ES. Rehabilitation for Persons with Long-Term Mental Illness: Final Report. Grant #H133B90023-00: U.S. Department of Education. National Institute on Disability Rehabilitation Research; 2005.
50. Locke EA, Latham GP. Building a practically useful theory of goal setting and task motivation. *American Psychologist*. 2002;57(9):705-17.
51. Becker DR, Drake RE, Farabaugh A, Bond GR. Job preferences of clients with severe psychiatric disorders participating in supported employment programs. *Psychiatric Services*. 1996;47(11):1223-6.
52. Bell M, Lysaker P. Levels of expectation for work activity in schizophrenia: Clinical and rehabilitation outcomes. *Psychiatric Rehabilitation Journal*. 1996;19(3):71-6.
53. Farley RC, Bolton B, Taylor JK. The effects on vocation development of a strategy for empowering and involving consumers in the vocational evaluation process. *Vocational Evaluation & Work Adjustment Bulletin*. 1993;26(3):97-100.
54. Kissen B, Platz A, W. S. Selective factors in treatment choice and outcome in alcoholics. In *Recent advances in studies of alcoholism*, edited by N. K. Mellow and J. H. Mendelson. Washington DC: US Government Printing Office; 1971.

55. Lovell AM, Cohn S. The elaboration of "choice" in a program for homeless persons labeled psychiatrically disabled. *Human Organization*. 1998;57(1):8-20.
56. Farkas M, Rogers ES. Innovative knowledge dissemination and utilization for disability and professional organizations and stakeholders; Grant #H133A050006: U.S. Department of Education. National Institute on Disability Rehabilitation Research; 2005.
57. National Institute on Disability and Rehabilitation Research. NIDRR's long range plan for fiscal years 1999 - 2003. Washington, DC: Department of Education; 1999.
58. Rose D, Thornicroft, G., Slade, M. Who decides what evidence is? Developing a multiple perspectives paradigm in mental health. *Acta Psychiatrica Scandinavica, Supplementum*. 2006;429:109-14.
59. Ablon JS, Marci C. Psychotherapy process: The missing link. *Psychological Bulletin*. 2004;130(4):664-8.
60. Anthony W. Studying evidence based processes, not practices. *Psychiatric Services*. 2001;54(1):7.
61. Anthony W, Rogers ES, Farkas M. Research on evidence-based practices: Future directions in an era of recovery. *Community Mental Health Journal*. 2003;39(2):101-14.
62. Westen D, Novotny C, Thompson-Brenner H. The empirical status of empirically supported psychotherapies: Assumptions, findings, and reporting in controlled clinical trials. *Psychological Bulletin*. 2004;130(4):631-63.
63. Locock L, Dopson S, Chambers D, Gabbay J. Understanding the role of opinion leaders in improving clinical effectiveness. *Social Science & Medicine*. 2001 Sep;53(6):745-57.

64. Stein LI. Innovating against the current. In: Stein LI, editor. Innovative community mental health programs. New directions for mental health services, No. 56: The Jossey Bass social and behavioral science series. San Francisco, CA: Jossey Bass Inc; 1992.
65. Anthony WA, Cohen MR, Farkas MD, Gagne C. Psychiatric Rehabilitation. 2nd ed. Boston, MA: Boston University, Center for Psychiatric Rehabilitation; 2002.
66. Anthony WA, Cohen M, Farkas M. The future of psychiatric rehabilitation. *International Journal of Mental Health*. 1999;28(1):48-68.
67. Dion GL, Anthony WA. Research in psychiatric rehabilitation: A review of experimental and quasi-experimental studies. *Rehabilitation Counseling Bulletin*. 1987;30(3):177-203.
68. Danley KS, Rogers ES, MacDonald Wilson K, Anthony W. Supported employment for adults with psychiatric disability: Results of an innovative demonstration project. *Rehabilitation Psychology*. 1994;39(4):269-76.
69. Unger KV, Anthony WA, Sciarappa K, Rogers ES. A supported education program for young adults with long-term mental illness. *Hospital and Community Psychiatry*. 1991;42(8):838-42.
70. Rogers ES, Palmer-Erbs VK. Participatory action research: Implications for research and evaluation in psychiatric rehabilitation. *Psychosocial Rehabilitation Journal*. 1994;18(2):3-12.
71. Anthony WA, Jansen MA. Predicting the vocational capacity of the chronically mentally ill: Research and policy implications. *American Psychologist*. 1984;39(5):537-44.
72. Meyerson AT, Fine T. Psychiatric disability: Clinical, legal and administrative dimensions. Washington DC: APA Press, Inc.; 1987.

73. Farkas MD, Anthony WA, Cohen MR. An overview of psychiatric rehabilitation: The approach and its programs. In: Farkas MD, Anthony WA, editors. *Psychiatric programs: Putting theory into practice*. Baltimore, MD: Johns Hopkins University Press; 1989.
74. Nemecek P, Forbess R, Farkas M, Rogers ES, Anthony W. Effectiveness of technical assistance in the development of psychiatric rehabilitation programs. *Journal of Health Administration*. 1991;18(1):1-11.
75. American Psychiatric Association . Websites worth watching. *Psychiatric Services*. 2000; November 51(11):1382.
76. Altman DG. Sustaining interventions in community systems: On the relationship between researchers and communities. *Health Psychology*. 1995;14(6):526-36.
77. Farkas MD, Cohen MR, Nemecek PB. Psychiatric rehabilitation programs: Putting concepts into practice? *Community Mental Health Journal*. 1988;24(1):7-21.
78. Kilbourne AM, Schulberg HC, Post EP, Rollman BL, Belnap BH, Pincus HA. Translating evidence-based depression management services to community-based primary care practices. *Milbank Quarterly*. 2004;82(4):631-59.
79. Paisley W. Knowledge utilization: The role of new communication technologies. *Journal of the American Society for Information Science*. 1993;44(222-234).
80. Backer TE, Liberman RP, Kuehnel TG. Dissemination and adoption of innovative psychosocial interventions. *Journal of Consulting and Clinical Psychology*. 1986;54:111-8.
81. Good T, Berenbaum H, Nisenson L. Residential caregiver attitudes toward seriously mentally ill persons. *Psychiatry*. 2000;63:23-33.

82. Cohen MR, Forbess R, Farkas MD. Psychiatric rehabilitation training technology: Developing readiness for rehabilitation (Trainer series). Boston, MA: Boston University, Center for Psychiatric Rehabilitation; 2001.
83. Farkas M, Cohen M, McNamara S, Nemecek P, Cohen B. Assessing readiness for rehabilitation (Rehabilitation Readiness Training technology). Boston: Boston University, Center for Psychiatric Rehabilitation; 2001.
84. Farkas MD, Anthony WA. Overview of psychiatric rehabilitation education: Concepts of training and skill development. *Rehabilitation Education*. 2001;15:119-32.
85. Cohen J. A power primer. *Psychological Bulletin*. 1992;112(1):155-9.
86. Cohen MR, Farkas MD, Cohen BF, Unger KV. Psychiatric rehabilitation training technology: Setting an overall rehabilitation goal (Trainer package). Boston: Boston University, Center for Psychiatric Rehabilitation; 1990.
87. Rogers E, Anthony W, Farkas M. The Choose-Get-Keep Approach to psychiatric rehabilitation. *Rehabilitation Psychology*. 2006.
88. Orleans CT. Promoting the maintenance of health behavior change: Recommendations for the next generation of research and practice. *Health Psychology*. 2000;19:76-83.
89. Harding C, Zahniser J. *Acta Psychiatrica Scandinavica Supplementum*, 90(Suppl 384), 140-146. 1994.
90. Spaniol L, Koehler M, Hutchinson D. Recovery workbook: Practical coping and empowerment strategies for people with psychiatric disability. Boston: Boston University, Center for Psychiatric Rehabilitation; 1994.
91. Spaniol L, Koehler M, Hutchinson D. Leaders' guide: the recovery workbook. Boston: Boston University, Center for Psychiatric Rehabilitation; 1994.

92. Farkas M, Gagne C, Anthony W, Chamberlin J. Implementing recovery oriented evidence based programs: Identifying the critical dimensions. *Community Mental Health Journal*. 2005 Apr;41(2):141-58.
93. Anthony WA, Furlong-Norman K, Koehler M. Shifting paradigm in mental health services: Supported education within the context of rehabilitation and recovery. In: Mowbray C, Brown KS, Sullivan-Soydan A, Furlong-Norman K, editors. *Supported Education and Psychiatric Rehabilitation: Models and Methods*. Columbia, MD: International Association of Psychosocial Rehabilitation Services; 2002.
94. Anthony WA, Brown MA, Rogers ES, Derringer S. A supported living/supported employment program for reducing the number of people in institutions. *Psychiatric Rehabilitation Journal*. 1999;23(1):57-61.
95. McLaughlin JA, Jordan GB. Logic models: A tool for describing program theory and performance. In: Wholey, editor. *Handbook of Practical Evaluation*. New York, NY: Jossey-Bass; 2003.
96. Anthony WA, Unger KV. Supported education: An additional program resource for young adults with long term mental illness. *Community Mental Health Journal*. 1991;27(2):145-56.
97. Mowbray C, Brown KS, Sullivan-Soydan A, Furlong-Norman K. Supported education and psychiatric rehabilitation: Models and methods. Columbia, MD: International Association of Psychosocial Rehabilitation Services; 2002.
98. Lim SY, Nicolellis DL, Fahey H, Jaggi C. Massachusetts mobile supported education programs. In: *Supported education and psychiatric rehabilitation: Models and methods*, by

Mowbray, C.T., Levine, P., Strauch Brown, K., Sullivan Soydan, A., . Psychosocial Rehabilitation Services. 2001.

99. Jacobson N, Curtis L. Recovery as policy in mental health services: Strategies emerging from the states. *Psychiatric Rehabilitation Journal*. 2000 Spr;23(4):333-41.

100. Lapsley H, Nikora LW, Black R. "Kia Mauri Tau!" Narratives of recovery from disabling mental health problems. Wellington: Mental Health Commission. 2002.

Table 1. Five Principles of Evidence Based Messaging.

1. Develop evidence-based messages that are based on a body of research, rather than on single data sets.
2. Build credibility with decision makers as a legitimate developer of evidence based messages
3. Build knowledge transfer expertise and infrastructure within the research organization.
4. Convey evidence based messages using an organized approach to achieve targeted outcomes.
5. Routinely evaluate evidence based messaging efforts.

Table 2: Examples of evidence-based messages developed and transferred by the Center to decision makers.

1. In terms of rehabilitation, the mental health system is plagued by poor outcome, distracted by an irrelevant diagnostic system, saddled with inefficient treatment approaches and burdened by a disorganized community support system.
2. Helping people choose their own goals can positively impact rehabilitation outcome.
3. The psychiatric diagnostic system is neither predictive, prescriptive nor descriptive of the practice of psychiatric rehabilitation.
4. No strong correlation exists between peoples' symptoms and skills.
5. The psychiatric rehabilitation field, including its process, outcomes, values and principles can be successfully described and taught.
6. People with psychiatric disabilities are positively impacted by psychiatric rehabilitation services.
7. People with psychiatric disabilities can and want to go to school.
8. People with psychiatric disabilities can and want to work.
9. People with psychiatric disabilities can and do recover.
10. Supports can improve people's functioning in living, learning and working environments (i.e., supported housing, supported education, supported employment).

Table 3: Summary of Knowledge Dissemination and Utilization Framework: Exposure, Experience, Expertise, Embedding.

Goal	Increased knowledge	Increased knowledge and positive attitudes	Increased competence	Increased use in practice
Strategies	Exposure (Dissemination)	Experience (Dissemination)	Expertise (Utilization)	Embedding (Utilization)
<i>Examples of Strategies for Target Populations</i>				
Providers	Conducting conferences; popular media; developing website specific to group	Creating internships	Writing and delivering training programs/manuals with supervised skill practice	Long term clinical and programmatic supervision;
Persons Served/Family Members	Publishing in popular media; developing website specific to group	Creating recipient – led program visits; creating discussion groups lead by role models with positive outcomes using innovation	Developing training programs in how to use or support the use of the innovation	Technical assistance in advocacy for the institutionalization of the innovation
Policy Makers; Legislators	Present position papers; testify at hearings; Task Forces	Meet with other policy makers who have used EBM	Visit successful policy sites for that EBM	On site systems level technical assistance for that EBM
Administrators	Conducting conferences; publishing in e-journals; popular	Program visits; interactive “webinars”; online discussion groups	Visit successful program sites	On site program level technical assistance; organizational development

Table 3: Summary of Knowledge Dissemination and Utilization Framework: Exposure, Experience,

Expertise, Embedding. Continued:

Strategies	Exposure (Dissemination)	Experience (Dissemination)	Expertise (Utilization)	Embedding (Utilization)
Target populations cont'd: Administrators cont'd	media; email correspondence; developing website specific to group			
Researchers	Publishing in professional journals, giving seminars, email bulletins; creating digital libraries	Creating research mentorships; brief internships	Creating supervised research fellowships; courses	Technical assistance/ advocacy to create ongoing availability of experts; ongoing research funding
Educators	Publishing in professional journals; association newsletters; writing classroom textbooks	Creating fellowships and academic study visits to programs using EBM innovation	Summer Institutes to teach educators how to teach new EBM material; developing scripted lesson plans and curricula	Creating faculty incentives for implementation; creating mentorship/peer relationships to support implementation

Table 3: Summary of Knowledge Dissemination and Utilization Framework: Exposure, Experience, Expertise, Embedding. Continued:

Strategies	Exposure (Dissemination)	Experience (Dissemination)	Expertise (Utilization)	Embedding (Utilization)
Target Populations cont'd: General Public	Creating websites; fact sheets; public service spots for media; creating neighborhood spokesperson	Take positions on community boards to feed in EBM information	Develop brief lay EBM training programs for those likely to be affected in some way	Usually occurs when methods for other specific targets populations have been implemented (e.g. change in legislation; insurance rules etc)

Adapted from Farkas et al, 2003
