



Richard P. Melia, PhD; Arthur M. Sherwood, PhD

Knowledge translation: A mandate for Federal research agencies

In this time of tightening budgets and increased accountability, Federal research agencies must be seen not only as effective in carrying out their missions (i.e., generating scientifically based results) but also as supportive of relevant work. The challenges to being relevant are at least as formidable as those to achieving scientific rigor.

The U.S. Department of Education's National Institute on Disability and Rehabilitation Research (NIDRR) recently published its "Long-Range Plan for Fiscal Years 2005–2009" in the *Federal Register*, in which it outlined a new approach to its legislatively mandated role in disseminating valuable information to persons with disabilities and their families [1]. This new approach at NIDRR can be traced in part to the first conference under the Translating Research into Practice initiative, which was held in 2003 by the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality.

At this conference, one topic of discussion was the implication of evaluating the quality of research findings. In this context, the conference participants reflected interest in the concept of knowledge translation (KT) as developed by the Canadian Institute of Health Research (CIHR). This institute defined KT as—

. . . the exchange, synthesis and ethically-sound application of knowledge—within a complex system of interactions among researchers and users—to accelerate the capture of the benefits of research . . . [2].

The CIHR further states that KT "encompasses all steps between the creation of new knowledge and its application to yield beneficial outcomes for society. This includes knowledge dissemination, communication, technology transfer, ethical context, knowledge management, knowledge utilization, two-way exchange between researchers and those who apply knowledge, implementation research, technology assessment, synthesis of results within a global context, development of consensus guidelines, and more" [2]. In a forthcoming book chapter, Campbell describes KT as "closing the gap between discovery and deployment" [3].

Through the leadership of Richard P. Melia, PhD,* NIDRR gave KT a strategic role in the logic model outlined in NIDRR's long-range plan mentioned previously. Dr. Melia vigorously promoted the understanding of the essential centrality of KT to research, beginning with conceptualization and

*Dr. Melia retired from NIDRR on May 3, 2006; his great contributions to its agenda since he first joined NIDRR in 1980 (at that time the National Institute of Handicapped Research) are sorely missed.

continuing through utilization of the results, and the benefits available from the “complex system of interactions among researchers and users.”

In some ways, KT is analogous to “participatory action research,” or “research that involves all relevant parties in actively examining current action together” to maximize the likelihood of relevant, meaningful research [4]

Key concepts of KT include its cyclic nature, in which the interactions of researchers and knowledge users (KUs) continually influence the direction, progress, and results of research so its continual relevance or meaning to KUs is assured. The CIHR recognizes that commercialization of research results is an important aspect of KT efforts; thus, technology transfer is also an important part of the KT process.

Equally important in the current (and foreseeable) environment is evidence vetting, in which great stress is placed on establishing and maintaining rigor in methods. Because of the historic problems of small populations of heterogeneous individuals, rehabilitation research is on the cutting edge of what will likely become the wave of the future—the “*n* of 1”—design that will become more and more widespread as the effect of genomics on medicine develops to the point that therapies will be tailored to each individual. Thus, the challenges we now face in conducting clinical trials in the current “flat earth society of randomized controlled trials” [5] will be faced by more and more medical disciplines and will demand that we identify and develop methods that yield the rigorous results demanded not only by KUs but also by those holding agencies accountable for producing meaningful results, both inside and outside government.

Likewise, the need to aggregate results across studies requires researchers to place great importance on the methods of aggregation. Individual researchers must pay close attention to the methods of such meta-analysis or else risk the marginalization of their efforts and the ignoring of their results. As new research methods are developed, we must devote similar efforts to examining the strategies employed in systematic review.

Who are the KUs alluded to in the definition of KT? In fact, many different groups are KUs, depending on the state of development of the subject matter under study. One early group of such users is other researchers who may benefit from knowledge of those efforts. In some ways, they are easier KUs to serve, for academic settings are well-structured and encourage communication through peer-reviewed publications, conferences, etc. However, we must not stop with this level of communication.

Another class of KUs is practitioners-clinicians (e.g., physicians, nurses, physical therapists, occupational therapists). Although assuming that the same approach that works for researchers (e.g., peer-reviewed journals) will be sufficient for these KUs is tempting, clearly, much more attention and effort should be invested if research results are to be translated effectively into improved organizational behaviors. Indeed, the U.S. Department of Veterans Affairs (VA) has mounted a major effort to effect such change through its Quality Enhancement Research Initiative (QUERI), which is run by the VA Health Services Research and Development Service [6]. QUERI seeks “to generate new knowledge about how to implement evidence-based research findings in clinical practice and to facilitate systematic, continuous implementation into routine clinical practice in several specific disease areas” [7]. Beginning in 1998, these efforts have demonstrated that while change is possible, it is also difficult and that an attitude of “build it and they will come” is not sufficient for research results to be used effectively. To accomplish even modest organizational change takes concentrated, thoughtful, and sustained effort over time that considers a plethora of factors, including local and national environments, political and economic considerations, and much more.

A third and very important class of KUs is public and private policy-makers, including advocacy groups. What these individuals seek are generalizable results that can be used as the basis for decisions about the costs of programs or the likelihood of successful applications. Their need is for compelling, well-founded, and reasoned research results

presented in a user-friendly manner. Although we may be tempted to couch results in a manner that would be attractive to particular groups of such KUs, such an approach will ill-serve the larger research agenda in the long run.

Last, but by no means least, are people with disabilities and their families, the ultimate beneficiaries of rehabilitation and disability research. Inherent tension exists between this class of KUs and researchers, beginning with the timeline for results; i.e., research articles most often conclude with “more research is needed,” whereas people with disabilities are looking for results in the present—not future—tense.

Indeed, people with disabilities rarely seek generalizable results from research but are instead likely to seek information related to their specific needs from their peers, as was illustrated by a distinguished speaker at a recent NIDRR-sponsored meeting. The speaker, who is a very effective advocate for people with disabilities, mentioned that when he thought about investing in new assistive technology, he first called friends who had similar needs instead of turning to any one of several excellent reference sources.*

This is the challenge for researchers: people with disabilities do not seek generalizable information, but information that specifically relates to them. Herein lies the continuous, healthy tension that exists between the ultimate beneficiary and the researcher in a “complex system of interactions among researchers and users” that encourages the researcher to ensure the information is as relevant as possible.

The KT level is where individual researchers and research organizations play an essential role in relation to the missions of the Federal agencies that support their work; i.e., this is where accountability meets grantee. To this end, grantees must support efforts to translate research findings into

accessible language and formats. They must strive to provide evidence of accomplishments that are meaningful to the ultimate beneficiaries. In this way, they can maximize the likelihood of successful accomplishment of the agencies’ missions. In the case of NIDRR, that mission is “to generate new knowledge and promote its effective use to improve the abilities of people with disabilities to perform activities of their choice in the community and also to expand society’s capacity to provide full opportunities and accommodations for its citizens with disabilities” [1, p. 8167].

REFERENCES

1. U.S. Department of Education, National Institute on Disability and Rehabilitation Research—Notice of final long-range plan for fiscal years 2005–2009. Federal Register. 2006 Feb 15;71(31);8165–8200.
2. Canadian Institutes of Health Research [homepage on the Internet]. Ottawa (Canada): The Association; c2005–7 [updated 2005 Oct 25; cited 2006 May]. About knowledge translation; [1 screen]. Available from: <http://www.cihr-irsc.gc.ca/e/29418.html>
3. Campbell ML. The government-wide shift in accountability for results: Implications for improving research outcomes in the aging and disability nexus. In: Putnam M, editor. Aging and disability: Crossing network lines. New York (NY): Springer Publishing Company; 2007. p. 225.
4. Wadsworth Y. What is participatory action research? Action Res Int [serial on the Internet]. 1998 [cited 2006 May];(Paper 2):[1 screen]. Available from: <http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html>
5. Dijkers M. There is more to research than RCTs: Against method myopia. 27th Annual Meeting of the National Association of Rehabilitation Research and Training Centers (NARRTCs); 2005 Apr 25–26: Washington, DC. NARRTCs; 2005.
6. Department of Veterans Affairs. (VA) Quality Enhancement Research Initiative (QUERI) [homepage on the Internet]. Washington (DC): VA; c2007 [updated 2007 Apr 27; cited 2006 May]. Available from: <http://www1.va.gov/hsrd/queri/>

*See <<http://www.ed.gov/rschstat/research/pubs/resources.html>> for links to several, such as <<http://www.abledata.com>> and <<http://www.Assistivetech.net>>.

7. Department of Veterans Affairs (VA). Guide for implementing evidence-based clinical practice and conducting implementation research [monograph on the Internet]. Washington (DC): VA Health Services Research & Development Service; 2004 [cited 2006 May]. Available from: http://www1.va.gov/stroke-queri/library/QUERI_Implementation_Guide.pdf

Arthur M. Sherwood, PhD

Science and Technology Advisor to the Director, NIDRR, Office of Special Education and Rehabilitative Services, U.S. Department of Education, Washington, DC

Email: arthur.sherwood@ed.gov

DOI: 10.1682/JRRD.2006.05.0056