CJNR 2004, Vol. 36 Nº 2, 89–103

Translating Research

Innovations in Knowledge Transfer and Continuity of Care

Ian D. Graham and Jo Logan

Continuity-of-care innovations are complex by their very nature, as they often involve the bridging of sectors (e.g., hospital, home, long-term care), settings (e.g., emergency, inpatient, or ambulatory care), agencies (hospitals, home-care authorities, nursing agencies), and provider groups (e.g., hospital or home nurses, primary-care physicians, consulting physicians from different specialties, other health-care-provider groups). The innovations can be fairly discrete, requiring minor changes in practice, or they can require major restructuring of health-service delivery.

Not surprisingly, transferring such innovations to practice and policy can be extremely challenging. While innovations for the purpose of improving continuity (such as introducing practice guidelines, changing aspects of case management, or improving communication among providers) are often grounded in conceptual and theoretical frameworks or empirical data, the same can seldom be said for efforts to implement them. One reason for this is that those interested in implementing continuity-of-care innovations (be they policy-makers, administrators, managers, or even researchers) may not have an appreciation for the field of knowledge transfer, which is also referred to as knowledge translation, knowledge exchange, knowledge mobilization, research use, diffusion, or implementation, to name just a few of the terms used. To avoid further confusion, we use the term knowledge transfer to mean the process by which knowledge or research findings are applied.

Given the complexity of continuity-of-care innovations, the use of knowledge transfer theories or models may serve to promote their uptake. In the next few pages we will briefly review some of the theories, models, and frameworks concerning knowledge transfer that could have relevance for implementing continuity-of-care innovations in both research and practice. This is a selective review intended as a broad sweep of the frameworks used in other disciplines and should not be considered a comprehensive review. We will highlight in greater detail one model we

have used with some success in a number of studies and implementation projects.

The literature covers two broad categories of knowledge transfer theories and models: classical and planned action. The classical theories/models of change are sometimes referred to as descriptive or normative. These theories/models are passive; they explain or describe the naturalistic process of change or diffusion of innovations (Rogers, 2003). Diffusion of innovations theory is the most prominent example of a classical theory of change. Some of the better-known observations deriving from Rogers's work are the innovation-decision process, the influence of potential adopters' perceptions about the attributes or characteristics of an innovation on its diffusion, and the relationship between adopter types and diffusion. Potential adopters pass through five stages when deciding to adopt an innovation: knowledge (becoming aware of the innovation), persuasion (developing positive attitudes towards the innovation), decision (making a cognitive decision to adopt the innovation — developing an intention to adopt), implementation (using the innovation), and confirmation (continuing to use, adapting, or abandoning the innovation). Rogers identifies several attributes or characteristics of innovations related to their diffusion. Innovations are more quickly adopted if they are compatible with current values, beliefs, and practices; are seen as more advantageous than the current practice (relative advantage); are easy to use (low complexity); are observed by others to be in use (observability); and can be easily tested before being formally adopted (trialability). Similar observations have been made by other authors (Tornatzky & Klein, 1982). Studies of factors related to the adoption of practice guidelines in health care have found that guidelines are more likely to be adopted if they are of low complexity, trialable, clear (not vague or nonspecific), evidence-based, and not requiring change in existing practice (Burgers et al., 2003; Foy et al., 2002; Grilli & Lomas, 1994; Grol et al., 1998).

Another contribution of Rogers's (2003) work is the observation that potential adopters fall into one of a number of adopter types in terms of diffusion: innovators (venturesome, cosmopolitan, socially disconnected), early adopters (respected, locally well-connected, self-conscious experimenters and opinion leaders), early majority (deliberate, local in perspective, watchful of early adopters), late majority (sceptical, conservative), and laggards (traditional, socially isolated, slow to change).

Lomas's (1993, 1994) Coordinated Implementation Model is more descriptive and focuses explicitly on the medical context. For example, it posits that better knowledge transfer may be achieved by replacing passive continuing medical education with active implementation activities that considers coordination of a broad range of interacting factors

that may promote or hinder adoption (e.g., economic, personal, administrative, and community-based incentives). While classical theories/models of change can be informative and helpful in identifying the determinants of change, they provide little direction on how to bring about the change.

Planned change theories/models differ greatly from classical change theories. They provide a set of logically interrelated concepts that systematically explain the means by which planned change occurs, predict how various forces in an environment will react in specified change situations, and help change agents control variables that increase or decrease the likelihood of the change occurring (Rimmer Tiffany & Johnson Lutjens, 1998; Tiffany, Cheatham, Doornbos, Loudermelt, & Momadi, 1994). Planned change refers to deliberately engineered change that occurs in groups of varying size and setting. Proponents of planned change theories/models may work with individuals but their objective is to alter social systems. Examples of planned change models/theories are Green's Precede-Proceed model (Green & Kreuter, 1999; Green, Kreuter, Deeds, & Partridge, 1980); Kotler's (1983) social marketing planning model; Berwick's (2003) rules for dissemination; Kitson and colleagues' Research into Practice Framework (Kitson, Harvey, & McCormack, 1998; Rycroft-Malone et al., 2002); and Logan and Graham's (1998) Ottawa Model of Research Use.

Precede-Proceed

Precede-Proceed specifies the steps that precede an intervention and suggests ways to proceed with it, including subsequent evaluation (Green et al., 1999). In the Precede stages, the implementer specifies the problem and identifies the factors that contribute to it. These factors are categorized theoretically as predisposing, enabling, or reinforcing and then rated in terms of importance and amenability to change. Predisposing factors are attitudes, beliefs, and perceptions. Enabling factors are resources, facilities, and skills. Reinforcing factors are rewards or incentives, such as positive feedback (Green et al., 1980). The key Proceed stages are implementation and evaluation of the intervention. The evaluation stage examines the degree to which the protocol was implemented and its effect on behaviour change and on predisposing, enabling, and reinforcing factors.

Social Marketing

The social marketing planning model (Kotler, 1983) consists of several stages: *planning and strategy,* during which research is conducted with the target group and resources available for the intervention are assessed;

selecting the relevant channels and materials for intervention, during which specifications for the program's structure and outcomes are made and the target group is segmented into homogeneous subgroups; *developing and piloting materials with the target audience* to determine their relevance, comprehensibility, and impact; and *implementation, evaluation, and feedback* to refine the intervention.

Social marketing is focused on effecting health behaviour change at the community level but has also been used as the basis for other quality-improvement strategies. For example, the principles of academic detailing proposed by Soumerai and Avorn (1990) are based upon social marketing approaches. In academic detailing, implementers conduct interviews to investigate baseline knowledge and motivations for current practice; focus programs on specific categories of physicians as well as opinion leaders; define clear educational and behavioural objectives; establish credibility through a respected organizational identity, reference authority, and unbiased sources of information, and present both sides of controversial issues; stimulate physician participation in educational interactions; use concise graphic educational materials; highlight and repeat essential messages; and provide reinforcement for improved practices during follow-up visits.

Rules for Dissemination

While not proposed as a model per se, Berwick's (2003) seven rules for transferring research to practice derive largely from the theoretical work of Rogers (1995) and Schroeder, Van de Ven, Scudder, and Rolley (1986). According to these rules, an implementer must: (1) find sound innovations, (2) find and support innovators, (3) invest in early adopters, (4) make early adopter activity observable, (5) trust and enable reinvention, (6) create slack for change, and (7) lead by example.

Research into Practice Framework

Kitson et al.'s (1998) planned change model for implementing evidence posits that three key elements must be assessed: the level and nature of the evidence, the context, and facilitation of the process. Evidence is defined as research, clinical experience, and patient preferences; context as culture, leadership, and measurement; and facilitation as characterization, role, and style. The elements are multidimensional and interactive and are considered equally important until evidence demonstrates otherwise. The authors outline a three-dimensional matrix of the three elements, which can be present on a continuum from high to low in any given implementation situation; successful implementation is a function of relations among these elements.

Ottawa Model of Research Use

We have found the Ottawa Model of Research Use, or OMRU (Logan & Graham, 1998), to be a particularly useful conceptual framework for guiding the implementation of continuity-of-care innovations that are being evaluated in the context of research and that require major practice or organizational changes. We have also found it helpful in planning and guiding knowledge transfer activities (including the implementation of continuity-of-care innovations) in practice settings (Graham & Logan, 2004; Harrison, Logan, Joseph, & Graham, 1998; Logan, Harrison, Graham, Dunn, & Bissonnette, 1999; Lorimer, 2002).

The OMRU offers a comprehensive, interdisciplinary framework of elements that affect the process of health-care knowledge transfer, and is derived from theories of change, from the literature, and from a process of reflection. Although not explicitly linked to Donabedian's (1988) germinal work describing the production of health care in terms of structure, process, and outcomes, it captures these characteristics along with important social factors.

The elements considered central to knowledge transfer are evidence-based innovation (e.g., a continuity-of-care innovation); potential adopters (those whose behaviour or practice are targeted for change); the practice environment (the settings, including sectors involved); implementation of interventions to promote the transfer of the innovation to practice; the adoption of the innovation (its use); and outcomes resulting from implementation of the innovation (e.g., those related to patient health, practitioner issues, and economic and system implications). A particular advantage of this model is that it may be applied at any level in the delivery of care (e.g., individual professional, team, organization, health-care system).

A number of assumptions are implicit in the OMRU. The model is dynamic in that it considers research use to be an interactive synergistic process of interconnected decisions and actions by different individuals related to each of the model's elements; it is not a sequential stage model of change (Buxton & Hanney, 1996). The process takes place over time, its sequence depending on the specific state of each element in a given context. Although presented as a linear diagram (Figure 1), the process should not be interpreted as unidirectional; all the elements influence and are influenced by the others, thus reflecting the complexity of the knowledge transfer process (this is depicted in Figure 1 by double arrows that create multiple loops). As patients/clients and their health outcomes should be the primary focus of evidence-based practice, another assumption is that patients/clients play a key role in all aspects of the process. A third assumption is that both the societal and health-care external environments will affect all aspects of the process and must also be considered.

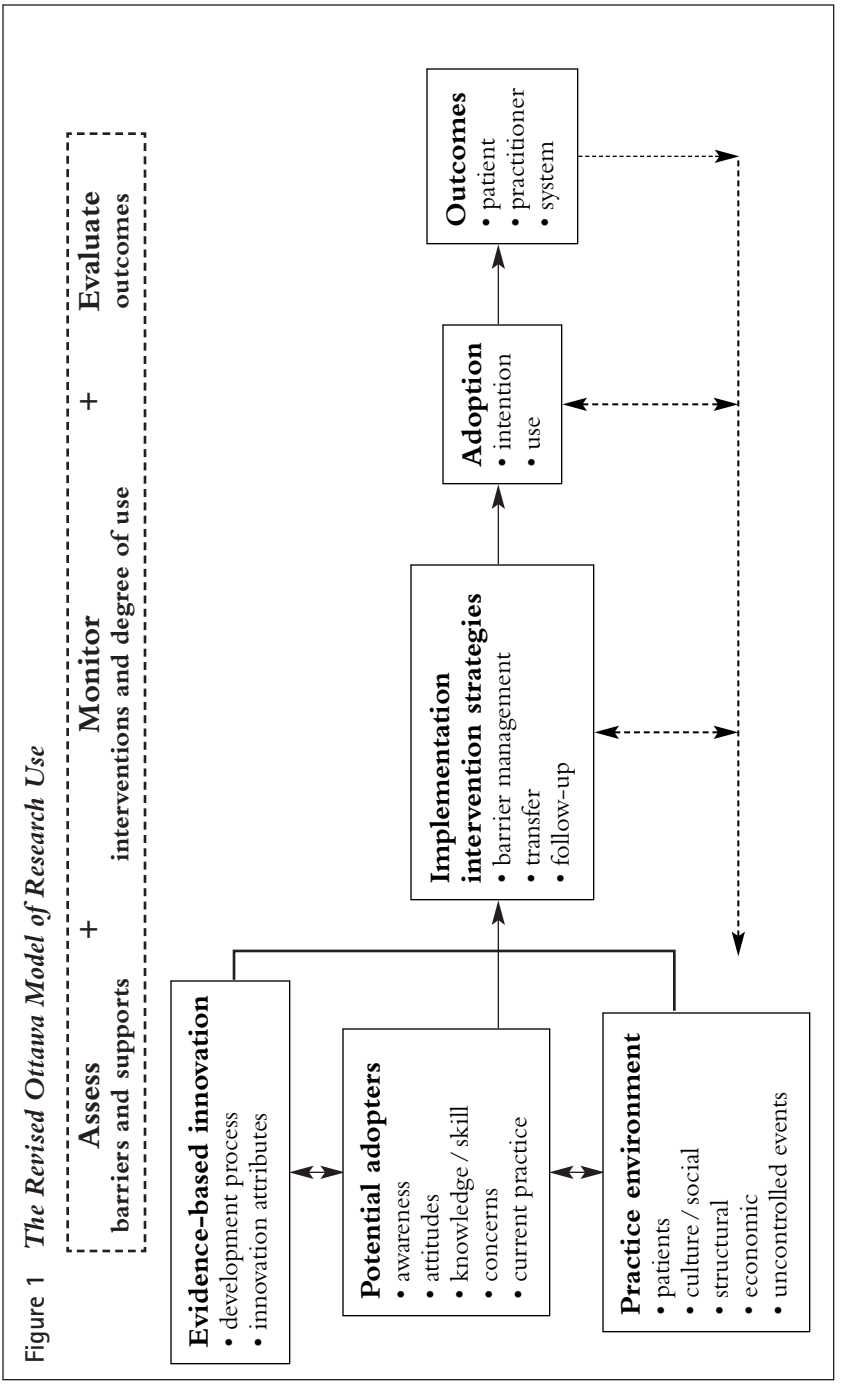

Figure 1 *The Revised Ottawa Model of Research Use*

The OMRU is classified as a planned action model because it provides direction as to the issues that should be addressed and the activities that change agents should undertake. When knowledge transfer is being planned, the model relies on a process of assessing, monitoring, and evaluating (AME) each element before, during, and after the decision is made to promote the innovation. In brief, the model directs change agents to conduct a barriers assessment of the innovation, the potential adopters, and the practice environment in order to identify factors that might hinder or support uptake. This information is used to select and tailor implementation interventions such that the barriers are overcome or supports enhanced. The introduction of the intervention is monitored to ensure that all potential adopters learn about the innovation and what is expected of them. Monitoring during the implementation phase can help determine whether the dose of intervention has been sufficient to bring about the desired change or whether a larger dose or a new intervention is required. Finally, the impact of the implementation process on outcomes is evaluated to determine whether the innovation is having the intended effect and whether it has any unintended consequences, and the iterative process begins again.

To demonstrate how the OMRU can be used as a guide in the implementation of continuity-of-care innovations, we have broken the process down into a number of steps.

Step 1: Getting Started

Those wishing to implement a continuity-of-care innovation must first identify the person(s) with the organizational authority to make the required changes. Other issues that must be considered relate to the jurisdiction and the scope of activities of those wishing to implement change. In the case of continuity-of-care innovations that cross sectors, settings, or agencies, this will entail the identification of individuals in each organization. If the change crosses the boundaries of professions or organizational units, strategic alliances must be either identified or cultivated. The availability of resources to implement the innovation must be determined, as successful knowledge transfer requires resources. Individuals who might serve as agents or facilitators of change must be identified and charged with responsibility for implementing the innovation, as successful change seldom occurs spontaneously.

Step 2: Clarifying the Innovation

The change agent should clarify exactly what the innovation is and what its implementation is likely to entail. For example, if the change is the adoption of a practice guideline, the change agent must determine exactly what clinical recommendations are to be implemented. If, for

instance, the innovation involves restructuring of the referral process, the change agent must develop a thorough understanding of what this will entail.

Step 3: Assessing the Innovation, Potential Adopters, and the Practice Environment for Barriers and Supports

The change agent should undertake a barriers assessment of the innovation, potential adopters, and practice environment in order to identify issues that could negatively impact adoption and can be targeted and overcome or diminished. The assessment should also include identification of possible supports or facilitators. Unfortunately, there are few validated instruments for assessing barriers and supports. We have carried out assessment in a number of ways, including interviewing key informants and conducting focus groups, surveying potential adopters, and conducting environmental scans, which could include chart audits and analysis of administrative databases.

The change agent must also identify all potential adopters or target audiences of the innovation. These may include policy-makers at the macro and meso level, managers and administrators, health-care professionals from numerous disciplines, educators, patients/clients, consumers, and even the public. The change agent should then assess potential adopters' perceptions of the characteristics of the innovation. This assessment should include their views on how the innovation was developed (e.g., Are the developers credible? Was the innovation process objective and rigorous? Was it explicit, transparent, and free from conflict of interest?). It should also include their perceptions of the characteristics of the innovation (its relative advantages, complexity, compatibility, trialability, clarity, user-friendliness). By determining potential adopters' view of the innovation, the change agent can respond proactively with interventions to clarify misperceptions, address negative perceptions, and promote attributes viewed as positive.

The barriers assessment of the potential adopters should include data collection regarding their awareness of the innovation, attitudes towards the change generally as well as specific to the innovation, any skills and experiences they might have that could be required in the implementation of the innovation, their concerns about the proposed change, and their intentions to adopt or use the innovation. Their current practices or habits should also be determined, as these could indicate the gap between current practice and that which will be required if the innovation is adopted. We have found that the barriers assessments of the innovation and potential adopters can be done simultaneously since they involve the same individuals.

Assessment of the practice environment for possible barriers and supports is essential, especially if the potential adopters are nurses (Estabrooks, 2003). As we have described elsewhere (Logan & Graham, 1998), the environment exerts a powerful set of influences on practitioners, policy-makers, and even researchers. Factors that should be considered include those of a structural nature such as the decision-making structure; rules, regulations, and policies; the physical structure of the setting; and workload. Cultural and social factors can also affect the success or failure of an innovation. These include the cultural and belief systems in place in the setting, local politics and personalities, leadership, peer influences, and endorsement of the change by local champions. Other factors such as economic considerations like availability of resources, equipment, and supplies; the remuneration system; medico-legal concerns; and specific organizational/system factors can all promote or inhibit adoption of the innovation.

Step 4: Selecting and Monitoring the Implementation Interventions

Having assessed the innovation, potential adopters, and practice environment for barriers and supports, the change agent is now ready to begin planning the implementation interventions and tailoring them accordingly. We have begun to classify the interventions in three ways, to reflect what we believe are quite different types of barriers. Barrier management includes interventions to address barriers at the organizational or system level. This might involve such actions as changing the remuneration process or staffing levels, purchasing special equipment, or modifying the documentation process. Transfer strategies are those strategies that are required to ensure that each potential adopter is aware of the innovation, understands how their behaviour must change, and has the skills or training to exhibit the required behaviour. Rogers's (2003) stages of the innovation decision process may be helpful, in terms of potential adopters, in the selection of interventions that are appropriate for each stage in the process. Follow-up interventions can be thought of as booster shots needed to augment the initial transfer activities. Follow-up activities may be particularly useful if the innovation entails a long learning curve or if the potential adopters are a very large or diverse group of individuals. The larger the group the longer it may take for the innovation to diffuse through it and the greater the need for follow-up interventions.

In addition to coordinating the implementation interventions, the change agent should monitor their introduction, via process evaluations, to ensure that they are being delivered as expected and are addressing the identified barriers, as well as to identify and address any unexpected barriers that may have emerged.

The evidence for the effectiveness of interventions in improving practice is limited but growing. The Cochrane Effective Practice and Organization of Care Group (EPOC) is a good source of such evidence (http://www.epoc.uottawa.ca/reviews.htm). Syntheses of the literature to date suggest that educational materials and didactic educational meetings have little or no influence on professional behaviour change. Audit and feedback, local opinion leaders, local consensus processes, and patient-mediated interventions are sometimes effective. Educational outreach visits, reminders, interactive educational meetings, multifaceted interventions including two or more of audit and feedback, reminders, local consensus processes, and social marketing are generally effective in producing professional behaviour change (Bero et al., 1998; Grimshaw et al., 2001). A recent review of interventions to improve the uptake of practice guidelines shows that simple dissemination of educational materials may be as effective as the more costly audit and feedback process, but more research is needed (Grimshaw et al., 2004). Synthesis of the evidence for changing nursing practice is even more limited, although one EPOC review included studies published prior to 1997 (Thomas et al., 2004); this review is currently being updated.

The general conclusions that can be drawn from the literature are that there are no magic bullets and that most implementation interventions are effective under some circumstances but none are effective under all circumstances. For many interventions the evidence is sparse. Generalization from trials and systematic reviews of interventions is hindered by poor understanding of the determinants of professional behaviour change and barriers to research uptake. Given the different contexts in which health professionals work, we should not automatically expect that findings for interventions that successfully change physician behaviour can be applied to nurses or others. Therefore it is reasonable to suggest that when attempting to tailor an intervention to identified barriers, the change agent first consider interventions for which there is evidence of effectiveness but also be prepared to be flexible and to experiment.

Step 5: Monitoring the Adoption

Decisions must be made about what constitutes adoption of the innovation, how adoption is to be measured, the method for collecting the data, the time frame for monitoring the adoption, and who will be responsible for monitoring it. Monitoring is necessary to determine the extent to which the innovation has diffused throughout the potential adopter group and affected the process of care. It can also be used to determine whether the intervention has been sufficient to bring about the desired

change or whether more of the same or a new intervention is required. If the degree of adoption is less than expected, it may be useful at this stage to assess the potential adopters' intentions, to determine whether the absence of change is related to a lack of interest on their part or is related to other barriers that may be beyond their control.

Step 6: Evaluating the Outcomes

In this step, decisions must be made about what outcomes will be used to determine the impact of the innovation on the health, practitioner, and system outcomes of interest, how they will be measured, how the data will be collected, the time frame for evaluation, and who will be responsible for it. Evaluating the impact of the innovation is the only way to determine whether the efforts to promote its adoption were worth it.

The OMRU provides a broad, comprehensive framework for planning the implementation of complex continuity-of-care innovations. The model does not yet provide detailed information on which implementation interventions should be used under various circumstances, either because there are insufficient theories for each element or because potentially relevant theories have not yet been validated for health-care professional or organizational change. However, the model is an ideal overarching framework that can be used with specific theories relevant to the field of knowledge transfer. This type of theoretical pluralism is particularly suited to the conduct and use of continuity-of-care research. Because continuity-of-care research addresses complex issues in multiple complex environments, there may be a need for additional theories to help guide both the original research and the knowledge transfer process. In this case, the OMRU can be used as a broad-based model to organize the required activities. Theoretical pluralism can be applied by embedding appropriate micro-range theories specific to some or all of the OMRU broad elements. Specific, well-tested theories from other fields of learning that are appropriate for the enterprise may be encompassed within the OMRU generic constructs. For example, specific theories for developing or adapting innovations would fit under the OMRU construct of the innovation. Theories such as those on organizational or individual behaviour would fit within the practice environment and potential adopter constructs, respectively. Theories on learning or marketing could be situated within the intervention construct to inform transfer strategies. Concurrently, when the focus is on the AME portion of the model, theories related to assessment and evaluation could provide additional guidance. Figure 2 illustrates how additional theories might be embedded within the OMRU.

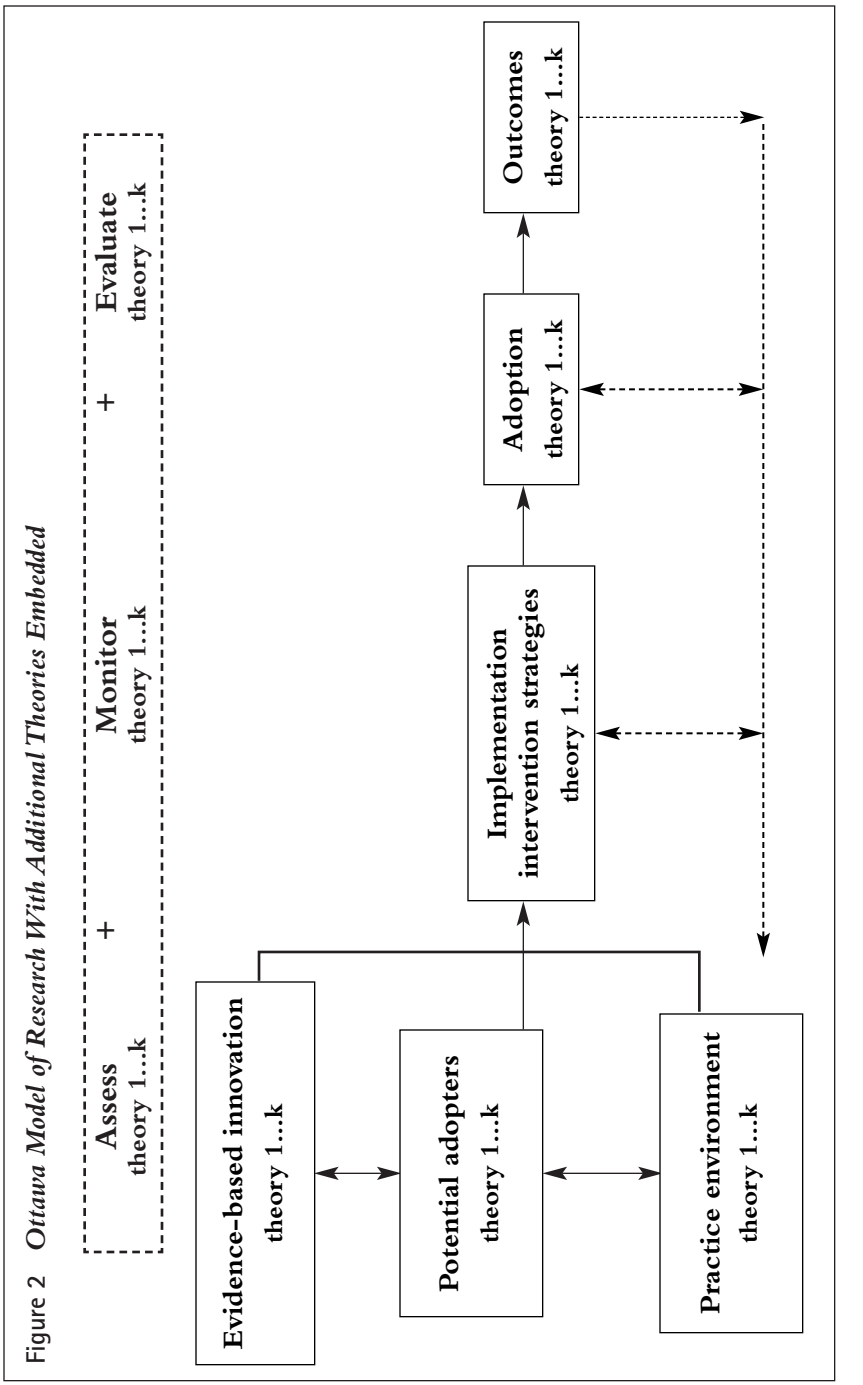

Figure 2 *Ottawa Model of Research With Additional Theories Embedded*

Summary

In summary, the transfer of continuity-of-care innovations to practice is a complex process. Knowledge transfer is complex in and of itself, and in the case of continuity-of-care innovations this complexity is compounded by the need to simultaneously target multiple sectors, settings, agencies, and providers. Although there are a number of knowledge transfer theories/models, their use in guiding implementation activities is not yet commonplace. If the health-care system and patients/clients are to benefit from continuity-of-care research, researchers and implementers will need to become better versed in the knowledge transfer literature, experiment with these frameworks when implementing innovations, and test their usefulness with different innovations in different contexts.

References

Bero, L., Grilli, R., Grimshaw, J. M., Harvey, E., Oxman, A., & Thomson, M. A. (1998). Closing the gap between research and practice: An overview of systematic reviews of interventions to promote implementation of research findings. *British Medical Journal, 317*(465), 468.

Berwick, D. (2003). Disseminating innovations in health care. *Journal of the American Medical Association, 289*(15), 1969–1975.

Burgers, J., Grol, R., Zaat, J. O. M., Spies, T., van der Bij, A., & Mokkink, H. (2003). Characteristics of effective clinical guidelines for general practice. *British Journal of General Practice, 53*(486), 15–19.

Buxton, M., & Hanney, S. (1996). How can payback from health services research be assessed? *Journal of Health Services Research, 1*(1), 35–43.

Donabedian, A. (1988). The quality of care: How can it be assessed? *Journal of the American Medical Association, 260*(12), 1743–1748.

Estabrooks, C. A. (2003). Translating research into practice: Implications for organizations and administrators. *Canadian Journal of Nursing Research, 35*(3), 53–68.

Foy, R., Penney, G., MacLennan, G., Grimshaw, J., Campbell, M., & Grol, R. (2002). Attributes of clinical recommendations that influence change in practice following audit and feedback. *Journal of Clinical Epidemiology, 55,* 717–722.

Graham, K., & Logan, J. (2004). Using the Ottawa Model of Research Use to implement a skin care program. *Journal of Nursing Care Quality, 19,* 18–24.

Green, L. W., & Kreuter, M. W. (1999). *Health education planning: A diagnostic approach* (3rd ed.). Mountain View, CA: Mayfield.

Green, L. W., Kreuter, M. W., Deeds, S. G., & Partridge, K. B. (1980). *Health education planning: A diagnostic approach.* Mountain View, CA: Mayfield.

Grilli, R., & Lomas, J. (1994). Evaluating the message: The relationship between compliance rate and the subject of a practice guideline. *Medical Care, 32*(3), 202–213.

Grimshaw, J., Shirran, L., Thomas, R., Mowatt, G., Fraser, C., Bero, L., et al. (2001). Changing provider behaviour: An overview of systematic reviews of interventions. *Medical Care, 39*(Suppl. 2), II-2–II-45.

Grimshaw, J. M., Thomas, R., MacLennan, G., Fraser, C., Ramsay, C., Vale, L., et al. (2004). Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technology Assessment, 8*(6), 6–5.

Grol, R., Dalhuijsen, J., Thomas, S., Veld, C., Rutten, G., & Mokkink, H. (1998). Attributes of clinical guidelines that influence use of guidelines in general practice: Observational study. *British Medical Journal, 317,* 858–861.

Harrison, M., Logan, J., Joseph, L., & Graham, I. D. (1998). Quality improvement, research and evidence-based practice: 5 years' experience with pressure ulcers. *Evidence-Based Nursing, 1*(4), 108–110.

Kitson, A., Harvey, G., & McCormack, B. (1998). Enabling the implementation of evidence-based practice: A conceptual framework. *Quality in Health Care, 7*(149),158.

Kotler, P. (1983). Social marketing of health behavior. In L. Frederiksen, L. Solomon, & K. Brehony (Eds.), *Marketing of health behavior: Principles, techniques and applications.* New York: Plenum.

Logan, J., & Graham, I. D. (1998). Toward a comprehensive interdisciplinary model of health care research use. *Science Communication, 20*(2), 227–246.

Logan, J., Harrison, M. B., Graham, I. D., Dunn, K., & Bissonnette, J. (1999). Evidence-based pressure-ulcer practice: The Ottawa Model of Research Use. *Canadian Journal of Nursing Research, 31*(1), 37–52.

Lomas, J. (1993). Retailing research: Increasing the role of evidence in clinical services for childbirth. *Milbank Quarterly, 71*(3), 439–475.

Lomas, J. (1994). Teaching old (and not so old) docs new tricks: Effective ways to implement research findings. In E.V. Dunn, P. G. Norton, M. Stewart, F. Tudiver, & M. J. Bass (Eds.), *Disseminating research/changing practice* (pp. 1–18). Thousand Oaks, CA: Sage.

Lorimer, K. (2002). *Leg ulcer occurrence: Risks and contributing factors. Community preventive study*. Unpublished MScN thesis, University of Ottawa.

Rimmer Tiffany, C., & Johnson Lutjens, L. (1998). *Planned change theories for nursing: Review, analysis and implications.* Thousand Oaks, CA: Sage.

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.

Rycroft-Malone, J., Kitson, A., Harvey, G., McCormack, B., Seers, K., Titchcen, A., et al. (2002). Promoting action on research implementation in health services. *Quality and Safety in Health Care, 11,* 174–180.

Schroeder, R., Van de Ven, A., Scudder, G., & Rolley, D. (1986). Managing innovation and change processes: Findings from the Minnesota Innovation Research Program. *Agribusiness Management, 2,* 501–523.

Soumerai, S. B., & Avorn, J. (1990). Principles of educational outreach ("academic detailing") to improve clinical decision making. *Journal of the American Medical Association, 2633*(4), 549–556.

Thomas, L., Cullum, N., McColl, E., Rousseau, N., Soutter, J., & Steen, N. (2004). Guidelines in professions allied to medicine: Cochrane review. *Cochrane Library, 2.*

Tiffany, C., Cheatham, A., Doornbos, D., Loudermelt, L., & Momadi, G. (1994). Planned change theory: Survey of nursing periodical literature. *Nursing Management, 25*(2), 54–59.

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *Journal of Evolutionary Economics Transactions on Engineering Management, EM39*(1), 28–45.

Ian D. Graham, PhD, is Associate Professor, School of Nursing, Faculty of Health Sciences, University of Ottawa, Ontario, Canada; Senior Social Scientist and Associate Director, Clinical Epidemiology Program, Ottawa Health Research Institute; and CIHR New Investigator. Jo Logan, RN, PhD, is Associate Professor, School of Nursing, Faculty of Health Sciences, University of Ottawa.