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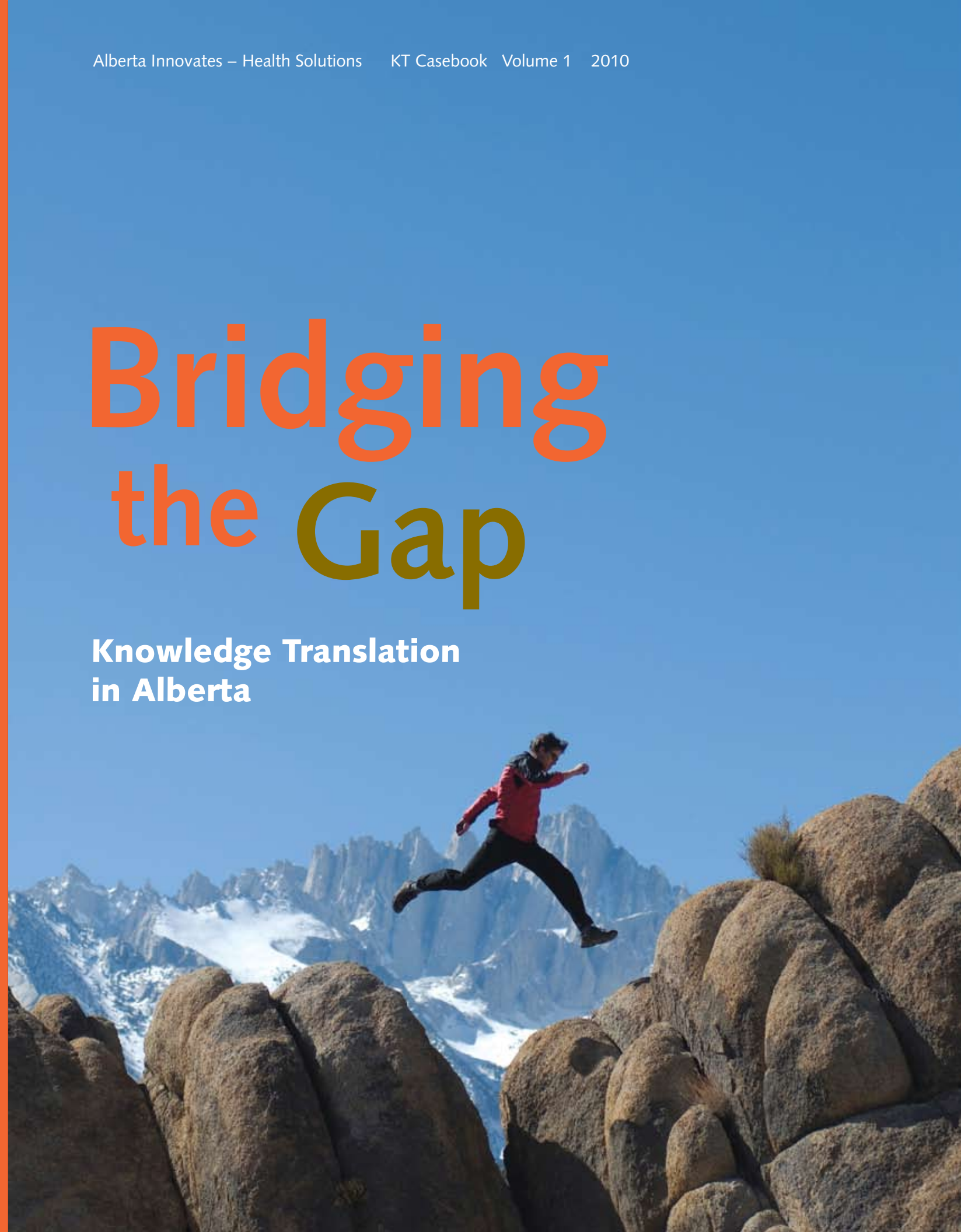
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Bridging the Gap

Knowledge Translation in Alberta



Knowledge transfer is the difference between research that shapes decisions and fosters innovation, and research that sits on a shelf. Knowledge transfer is a deliberate process of information exchange between producers and potential users of research that supports evidence-informed decision making and ultimately improved health.



Do you want to ...

- know how research can be better mobilized to inform healthcare policy and practice?
- know how to use research in your daily practice, or to plan programs?
- know how research can be informed by decision-makers?
- learn more about navigating the knowledge-to-action cycle?

Then you should become a member of the Health Research Transfer Network of Alberta (RTNA). Members include researchers, policy-makers, health system managers, and knowledge translation specialists.

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- Workshop series – intensive workshops on topics such as Plain Language Writing, Developing KT Plans in Grant Proposals, and Social Marketing
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- Participation – opportunities to actively shape the RTNA and its future direction through participating in working groups
- Networking opportunities – meet with other members of the RTNA and with National leaders in KT through our many programs

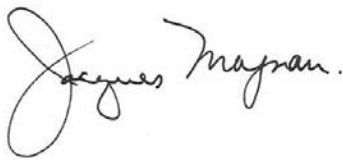
Interested in becoming a member of the RTNA?

Visit our website at www.ahfmr.ab.ca/rtna/ and click on “Benefits of Membership” or email rtna.health@albertainnovates.ca

The legislative mandate of Alberta Innovates – Health Solutions is to “support research and innovation activities to improve the health and well being of Albertans and create, through innovation, health-related social and economic benefits for Albertans.” This mandate speaks to the increased focus of governments, agencies and researchers across Canada and in fact around the world on improving the impact of research through knowledge transfer and use, and finding innovative solutions to health and health system issues.

Knowledge transfer, or translation, is a relatively new discipline and we still have much to learn. What we do know is that knowledge transfer requires a deliberate and sustained effort from both the research and practice communities. This casebook presents an impressive collection of stories that highlight the depth and breadth of knowledge transfer activities in Alberta. We thank the Abstract Review Committee for their hard work in selecting cases to be presented. We hope that the lessons from these cases will be used by others to advance the practice of knowledge transfer.

Jacques Magnan, PhD
CEO
Alberta Innovates – Health Solutions



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Knowledge Translation in Alberta: Lessons from the KT Casebook

Paula Robeson

KT in Alberta

This Casebook provides important research and practice-based accounts of knowledge translation in Alberta, the barriers faced, and keys to success. The lessons revealed in this document complement existing bodies of research knowledge related to KT. Many of these lessons learned relate to the interpersonal nature of knowledge exchange. As described by Chapman and colleagues, KT is a “social process engaging individuals and organizations” in which relationship development and maintenance, as well as social interaction, are key activities. To move knowledge into action, this knowledge must be seen as relevant to end users and key stakeholders, to their clinical or decision making contexts, and to the clients they serve. The application of this knowledge will be enhanced by its perceived benefits and affected by the contexts in which it is to be used.

This Casebook involves a diverse set of creative research and knowledge translation initiatives, with different populations, stakeholders, and settings. These initiatives include:

- the development and/or testing of innovative technologies, such as 3D Gait Analysis to more accurately assess running related injuries, hand-held laser scanner topography for the design of prosthetics, Intelligent Turn Manager Technology for the prevention of pressure ulcers, a Web-Based Seamless Discharge Communication Tool to improve patient transition between hospitalization and primary care settings, smart phone and tablet-based teleradiology, and the innovative, web-based Practice-Based Evidence in Nutrition (PEN) to provide tailored support to dietitians in their evidence-informed decision making efforts;
- innovative tools to facilitate the transfer and exchange of knowledge and enhance its applicability and relevance between and among researchers and specific audiences, such as digital storytelling, knowledge brokering, personal narratives, electronic communities of practice, and web-based science communications using humor to share knowledge through videos and blogs;
- diverse settings such as a safer workplace through mock-ups in the Ward of the 21st Century with the potential to transform the clinical environment and the way health services are delivered, virtual spaces to connect professionals across vast geographical distances, and formalized partnerships to foster integrated KT;
- capacity development among individual and organizational end-users to understand and act on evidence, to participate in the co-creation of knowledge, and to utilize specific knowledge products through workshops and other face-to-face interactions; and,
- the development of researcher capacity to conduct research that generates knowledge that is needed by and relevant to end users, and to involve end users in the co-creation of knowledge.

It is hoped that this Casebook will enable others involved in KT to realize that effective KT is possible, to avoid the barriers described herein, maximize the facilitators identified, and further develop their network of relationships to share knowledge and to learn lessons beyond that which is contained in this document.

Make it Relevant

A comprehensive understanding of the needs, priorities, and contexts of end users - from across multiple system levels, health care professions, and diverse populations - is critical to effective knowledge transfer and use. These cases indicate that the lack of context-relevant knowledge, or adaptable practice-relevant tools, can be a barrier to KT. Needs assessments, as utilized in many projects reported in this casebook, inform the tailoring of research and KT approaches to address the priorities and realities of knowledge users. For example, focus groups were used to identify knowledge needs, solicit input into product design, inform the development of relevant messages contained in knowledge products, and determine usefulness in practice. Knowledge brokers were described as key to the development of context-tailored strategies. The tailoring of knowledge was identified as essential to knowledge use by several authors.

Research team and partnership members often bring with them a wide network of colleagues and clients. These networks can be leveraged to broaden reach, better understand the needs and contexts of key stakeholders, and ensure that diverse perspectives are considered.

Integrated KT

Integrated KT, a relatively new concept under the broader KT umbrella, involves the purposeful and active engagement of end users throughout the research process. Researchers and key stakeholder end users work together on the identification of research priorities and the formulation of the research question, the methodology, interpretation of findings, development of key messages, and movement of the research into application in the decision making setting, be that in practice, program development, and/or policy.

Key findings and lessons learned from the majority of the knowledge and innovation transfer projects in this Casebook have highlighted the importance of the engagement of key stakeholders early and throughout the research and knowledge transfer processes. Identifying the audiences most likely to be impacted by the knowledge and technology transfer is important as is understanding their knowledge needs and the context in which this knowledge is to be applied. Through this engagement, the barriers to and facilitators of KT may be more easily identified, and strategies developed to address them. The meaningful involvement of end users at all stages of research and KT will enable timely adaptation of knowledge products or approaches for meeting the changing needs in today's complex, dynamic health care environments.

“The meaningful involvement of end users at all stages of research and KT will enable timely adaptation of knowledge products or approaches for meeting the changing needs in today’s complex, dynamic health care environments.”

Engage End Users and Other Stakeholders

The importance of stakeholder engagement is well supported by KT research. Strategies to improve engagement include formal and informal partnerships between researchers, health organizations, health care professionals and other decision makers, industry and the corporate sector, as well as patients and the public. For example, one case describes a knowledge exchange collaborative involving key stakeholders that assessed the human factors and patient simulation methods of mocked-up room designs to inform real-world facility design.

Other strategies include:

- user-driven digital storytelling as a KT tool to capture and share parents' and providers experiences with early intervention programming;
- personal stories of patients to humanize knowledge and enable KT through a deep connection with their lived experiences and contexts;
- the metaphor of a KT stream to engage stakeholders in wading through the messiness of KT to address barriers and facilitators to effective delirium care; and,
- the use of knowledge brokers to aid engagement by bringing research users and producers together to promote greater understanding of each others' contexts and needs.

Early, ongoing, and multifaceted collaboration with end users and other stakeholders was identified as key to KT success. While this engagement is viewed as an essential factor in successful knowledge and technology transfer, it poses challenges to researchers. Relationships can be complex and require special attention. Collaborative processes are often influenced by the characteristics of participants and their networks. Senior management support can positively impact the engagement of staff in KT and thus the success of KT programs.

“Collaborative processes are often influenced by the characteristics of participants and their networks. Senior management support can positively impact the engagement of staff in KT and thus the success of KT programs.”

Use Technology to Promote Engagement and KT

While the creation of technological products can be the focus of KT efforts, technology can also be utilized for user engagement and as a tool for KT. The Science in Seconds project blends science and humour, and enables interactivity via online videos and blogs. Digital storytelling uses narratives of experiential knowledge to facilitate KT and evidence-informed decision making (EIDM). These electronically captured stories can be tailored to specific audiences to ensure relevance.

Initiatives from this Casebook have demonstrated the power of the following tools:

- Social media
- Blogging
- Dynamic websites
- Digital storytelling
- Recorded personal narratives
- Web-conferencing
- Online decision-support tools
- Electronic communities of practice

The Power of Face-to-Face Interactions

While technology can enable interaction and KT, it is important not to underestimate the impact of face-to-face engagement. Technology can be used to complement face-to-face interactions, and can also be used in combination with more traditional KT products and strategies. A variety of strategies can be used to ensure this personal exchange of knowledge, even though limited resources may prevent geographically-dispersed stakeholders from always connecting in person. In one case a meeting at a national conference has been leveraged to develop relationships that continued online and developed into an Interprovincial Health Collaborative; in another case, rural workshops have been combined with regional competition, with ongoing support provided through a virtual learning and content management system to support the delivery of a core competencies education program.

“While technology can enable interaction and KT, it is important not to underestimate the impact of face-to-face engagement.”

Sustainable Solutions

Effectively sustaining a KT initiative can be challenging. The challenges pose barriers to implementing practice and policy change. As reported by several Casebook contributors, system changes can result in loss of funding and support. When appropriate, the commercialization of products may provide support for current and future KT efforts. Engagement with potential funders throughout the life of a project may provide the needed resources. Economies of scale may be found through collaboration or formal partnerships. Sustainability can be enhanced through investment in relationships. Demonstrating effectiveness and informing the adaptation of materials and approaches through on-going process and outcomes-based evaluations can provide the evidence for continued investment in KT projects.

The support of organizational leaders is key to the sustained success of knowledge transfer. However, the positive impact of leadership is not limited to formal organizational or professional leaders; the power of credible knowledge champions within organizations or partnerships can be harnessed to promote research use in decision-making at multiple levels. Organizations and their leadership should also acknowledge and provide the time and resources required to learn and use new technology and/or apply knowledge into practice.

Strategies for addressing barriers to sustained member engagement may lie within multifaceted and dynamic approaches to personnel training, capacity development, and the introduction of new technologies. The PEN initiative of the Dietitians of Canada credits PEN's capacity-building orientation, ongoing technical and other support services, and student engagement with its sustainability. Knowledge products or tools for KT can help build capacity for the consistent and systematic use of evidence-informed tools for transferring knowledge.

“Strategies for addressing barriers to sustained member engagement may lie within multifaceted and dynamic approaches to personnel training, capacity development, and the introduction of new technologies.”

About the Author

Paula Robeson, R.N., M.Sc.N., is an experienced Knowledge Broker with Health Evidence, a Knowledge Translation and research program at McMaster University School of Nursing. As the Knowledge Broker, Paula plays an integral role in the delivery of services and resources to Canadian public health decision makers. In particular, her role involves tailored approaches to individual and organizational capacity development for evidence-informed public health decision-making.



Development of 3-D Gait Analysis for Use in a Clinical Setting

Reed Ferber and Kent Bates

Abstract

Running is one of the most common physical activities for Canadians, and research indicates that between 27% and 50% of runners sustain a musculoskeletal injury each year. In many cases, a clinician performs gait analysis either visually or using a single two-dimensional (2D) video camera. However, Dr. Ferber's research demonstrates that 2D gait analysis is an inaccurate method for measuring the complexities of movement. Ferber's team has developed the 3D Gait Analysis System which provides clinicians with auto-generated reports to better understand injury assessment, optimize treatment recommendations, and provide data for continued research and development. As of September 2010 the 3D Gait Analysis System has been installed in clinics in Calgary and Banff, and expansion plans aim to have 500 systems operating globally by 2015.

Background

Running continues to be the number one participation sport in North America with an estimated 45 million to 51 million participants. According to Running USA's "State of the Sport 2009," the number of people who ran at least once a week increased 18% from 2007 to 2008, and sales of running shoes rose 5%, while the athletic footwear industry as a whole saw growth of only 1%. These data indicate that even during a recession, people will continue to invest in their personal health and wellness.

Current research indicates that 27-50% of runners will sustain a musculoskeletal injury each year. Due to the repetitive nature of running, most injuries are a result of overuse and reoccur yearly.

Thus, there is a clear and consistent supply of patients available and a clear need for innovative health solutions for this growing and active population. For an injured runner, there are several options available for treatment. In many cases, a clinician performs some form of gait analysis to better understand how their underlying walking and running mechanics relate to injury aetiology. However, most clinical gait assessments are performed either visually or using a two-dimensional (2D) approach and a single video camera, which are cumbersome, time consuming, inaccurate, and non-scientific.

The advent of three-dimensional (3D) biomechanical analysis allows for very accurate measurement of gait biomechanics. As motion capture companies evolve and the price for technology is reduced, 3D motion capture systems are now more affordable. More importantly, as our research continues to progress, we have begun to develop automated data analysis methods and algorithms for understanding injury aetiology and optimization of treatment. Therefore, our goal is to bring sophisticated 3D technology to clinicians and help them to interpret and integrate this technology into their daily practice.

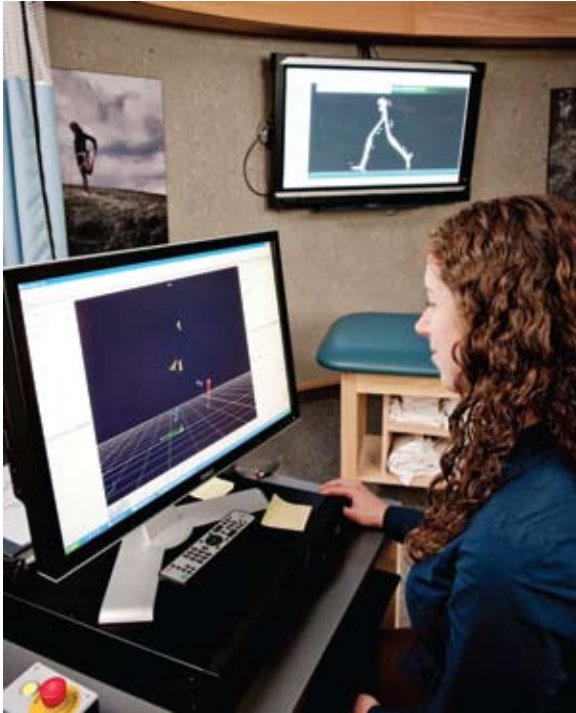


Dr. Ferber (left)
Analyzing runner's gait.
Wendy Kimmel at computer.

KT Initiative

The goal of the Running Injury Clinic is to educate and develop injury prevention and rehabilitation programs for all runners and walkers through world-class research and clinical practice. The clinic specializes in 3D biomechanical and clinical analysis of walkers and runners for the purpose of understanding the aetiology of musculoskeletal injury. Our clinic and research

laboratory are comprised of biomechanists, mechanical engineers, certified health professionals, and researchers and we offer injury analysis appointments to the general public. All of the public patients seen at the clinic can potentially be research subjects under the various on-going research studies. Thus, our business model is to facilitate our research through our clinical practice and to improve our clinical practice through our research. We have been very successful in our media releases and marketing strategies to date and our business and research have grown dramatically over the past few years. The idea to expand our 3D analysis services to other clinics is one of the main reasons Ferber was hired by the University and the fact that we are located at the University of Calgary is one of the main reasons we have grown so quickly and have been able to develop this technology.



We have successfully researched and developed the 3D Gait Analysis System, which includes three-dimensional motion capture cameras, custom software, training, and installation for an individual clinic. This system allows the clinician to perform a clinical 3D gait analysis and receive an auto-generated scientific report to help optimize and better understand injury assessment for each of their patients. The data collected from each clinic will be used for continued research and the development of new products that will allow us to expand our research and improve our KT potential.

The system was initially developed in consultation with the athletic therapists and physiotherapists working and training in the Running Injury Clinic with Ferber. We began meeting with physiotherapists and chiropractors from THE Downtown Sports Clinics (Calgary, AB) on a regular basis in late 2009 to ensure that the system will provide a clinically relevant report for injury assessment and gait analysis. Based on their feedback and constructive criticism, we finalized our v1.0 software and installed a system in THE Downtown Sports Clinics in March 2010. Little convincing was needed before the clinicians accepted this new technology since our peer-reviewed research, and research from other labs, have shown that 2D analysis of walking and running mechanics was fraught with error. Moreover, the financial projections, based on the fact that there is no direct competition for this type of service anywhere in the world, were very promising. Finally, the fact that the Running Injury Clinic had also been fully booked with public patients over the past five years, had been using this type of analysis for injury assessment and treatment already, and had received peer-reviewed funding from Alberta Innovates – Health Solutions and Technology Futures as well as from several other research foundations were also seen as a significant selling point.

However, our initial software proved to be somewhat confusing for the clinicians. For example, after using the system for sometime, physiotherapists at THE Downtown Sports Clinics reported that contradictory statements in the report made the injury interpretation difficult. Thus, we developed a v2.0 and subsequent v3.0 software to address their concerns and those raised by other clinicians. Moreover, the public met the expansion of our brand, from the Running Injury Clinic to the 3D Gait Analysis System, with some resistance. Primarily this resistance was due to Ferber not being involved in the injury assessment process. However, a marketing campaign using social media and conventional media resources proved successful in overcoming this barrier. Most notably, a recent story in Canadian Running Magazine (Sept/Oct 2010 issue) provided a very good description of our system, Ferber's behind the scenes involvement, and the research behind its development.

Results

Our first system was installed at THE Downtown Sports Clinic in Calgary in March 2010. Our second installation was with Banff Sports Medicine in September and our third and fourth will be in Victoria and Lethbridge in October. Currently we are in negotiations with four other clinics in different cities in Western Canada. Our plan is to have four clinical sites in year one, a goal already achieved, an additional eight sites in year two, and an additional 80 each year thereafter. Our goal is to have 500 systems, installed worldwide, within the next 5 years.

Our future plans include research and development of a product line including, but not limited to, consistent and optimal footwear prescription techniques, 3D gait analysis for proper orthotic prescription and manufacturing, and 3D gait analysis for improving running performance. With the increased revenue from our initial 3D Gait Analysis System, we will reinvest a minimum of 50% of the gross revenue for future research and development projects. At each Annual General Meeting we will accordingly adjust the amount reinvested to optimize our company's growth. In this fashion, we will continue to develop innovative health solutions for clinicians and Albertans.

Key Messages

We have successfully brought a technology product to the market with our 3D Gait Analysis System. Based on four years of research and development, financial support from Alberta Innovates – Health Solutions and Technology Futures, our goal is to improve health care and develop innovative health care solutions.

About the Authors

Dr. Ferber is a board certified athletic therapist and holds a Ph.D. in sports medicine and gait biomechanics from the University of Oregon. He has completed post-doctoral research fellowships at the University of Delaware and the University of Calgary and specializes in the research and clinical treatment of lower extremity injuries. He is the director of the Running Injury Clinic and an assistant professor in the Faculties of Kinesiology and Nursing at the University of Calgary. Dr. Ferber is also a population health investigator through the Alberta Innovates Health Solutions.

Kent Bates is the Director of Business Development for the Running Injury Clinic. His responsibilities include leadership of knowledge translation and technology commercialization.

Introducing Innovative Technology into Traditional Rehabilitation

Jim Raso, Isabel Henderson, Darrell Goertzen, and Gary Faulkner

Abstract

In recent years, neuroplasticity theory has led to a greater understanding of how physical and cognitive impairments can be mitigated by the implementation of engaging and repetitive therapies. Beginning in 2007, the Glenrose Rehabilitation Hospital set out to study how cheaper, more powerful, and more pervasive technologies might affect the delivery of rehabilitation services. After conducting a literature review and interviewing stakeholder and expert communities, four technology areas were identified that were deemed to have a major impact: virtual rehabilitation, robotics, cognitive learning, and telerehabilitation. As a result of this review, a central space in the Glenrose Rehabilitation Hospital was renovated to be a technology hub and a process was developed to identify and implement new technologies. The authors conclude that integrating innovative new technologies requires the continuous engagement of clinicians to identify barriers, assess feasibility, and plan implementation, and to restructure jobs, space, and clinical priorities.

Background

Technology is often the only means persons with physical or cognitive impairments have to overcome limitations imposed by a disability. Over the past several years, we have increased our understanding that neuroplasticity can be used to improve function. Neuroplasticity refers to changes in the central nervous system structure and connectivity that occur in response to environmental and behavioural conditions.¹ This enables people to recover following some types of nervous system lesions and for all of us to learn new skills. Through appropriate rehabilitation therapy, these changes can lead to significant improvements in function. Neuroplastic changes are facilitated in part, by training that is intense, repetitive and engaging. Therefore, we see a role for technology to augment traditional therapeutic practices.

In parallel with the increasing knowledge of neuroplasticity have been revolutionary changes in technology. Computer processors are embedded in many consumer goods, communication networks are pervasive, sensors and actuators are inexpensive and readily available, and social media has changed the fundamental nature of how knowledge is shared. These technological drivers are having a great influence on the delivery of healthcare.

A third driver is the scarcity of health resources along with an increased demand for services, partly due to the aging of the population. In order to prepare for future demand with limited resources, novel approaches to rehabilitation must be investigated and trialed.

KT Initiative

The challenge we undertook was to use the knowledge of neuroplasticity and advanced technology to improve the function of our patients. The steps in this knowledge transfer process were to: (1) build the teams necessary to implement the strategy; (2) develop a staff communication process, and; (3) develop a technology implementation plan, with the end result that the front line clinicians will be ready and able to add these new rehabilitation techniques to their practice. Concurrently, the Glenrose Foundation committed to raising funds to renovate a technology hub within the hospital, the Courage Centre, and to support the purchase of advanced rehabilitation technology.

Methodology

For our patients to get the most benefit from these advances, a focused and explicit effort is required to identify, assess, and implement rapidly emerging technologies. A Technology Strategic Plan was prepared to describe the major directions in which technology will play a role in enhancing rehabilitation at the Glenrose and beyond, and to define a knowledge transfer process. Input to the plan was based on staff forums, a review of the literature, and 27 interviews with key stakeholders: clinicians, researchers, administrators, and patient groups. Interviewees were asked a series of questions designed to determine the technology opportunities available today that could address the wide range of functional impairments seen at the Glenrose, those technologies deemed to be emerging, as well as barriers and facilitators to implementation. This strategic review identified opportunities to enhance rehabilitation using technologies in the following four areas:

- robotics
- virtual rehabilitation
- cognitive rehabilitation
- telerehabilitation.

Based on the strategic review, the following strategies were proposed in order to achieve the mission for successful rehabilitation technology at the Glenrose.

- Build the teams required for knowledge translation.
- Develop a staff communication plan.
- Develop a process for implementing new technology.

KT Strategy 1: Building the Teams

A Technical Integration Committee was formed consisting of researchers, physicians, front line staff representing each of the four technology areas, and a community member who is a user of rehabilitation technology. This 10-person committee makes the final technology decisions based on input from the four steering committees.

Steering committees were set up for each of the four technology focus areas. These groups, mostly front line therapists, meet monthly to share knowledge and make recommendations for equipment and processes.

A third phase in the team building approach was to identify early adopters for each technology item, tasked with the introduction of the technology at the clinical level. These champions drive the effort needed to adapt the treatment regimes and, perhaps more importantly, to provide the example to clinical peers.

KT Strategy 2: Communication

The Glenrose is committed to an interactive process for staff and stakeholder input into the technology selection and implementation process. A communication planning session with a professional facilitator was held to identify issues and generate ideas. Glenrose staff and external collaborators were asked to provide ideas on designing the staff participation process.

Brainstorming rounds were completed in two areas: (1) Creating broad based involvement in technology planning, and (2) Identifying and communicating needs. The discussion of creating broad based involvement in technology planning highlighted the need for effective two way communication with mechanisms for continuous feedback, and allowing active involvement of front line staff and community stakeholders in the decision making process. Suggestions were “to create a well informed consumers”—staff (and patients) that are knowledgeable and well informed about technology options. This resulted in several initiatives: a regular technology newsletter, which was started to describe available or emerging technologies; conference or site visits by front line staff; brown bag lunch hour sessions; and a series of invited international speakers presenting at early morning technology forums.

These results tied together well with the second question of “identifying and communicating key needs in your area.” A technology champion was designated in each clinical group to gather and forward new ideas to the steering committee members. Multiple venues for feedback and idea sharing are being developed, both online and offline, with the requirement that they must be quick, easy, and user-friendly.

KT Strategy 3: Introducing New Technology

The third process in the technology strategic plan was an Introduction of New Technology document outlining the following steps:

1. needs assessment
2. technology scanning
3. technology assessment
4. implementation
5. evaluation.

The results of the strategic review formed the base information and this is combined with an ongoing scan of current needs and emerging technologies. These activities will result in a list of technologies that will target the functional needs of our patients. Technologies fall into two categories: (1) commercially available rehabilitation technologies, and (2) ones that can be rapidly developed based on available components and outside expertise.

After this identification process, an assessment template specific for the Glenrose was developed based on existing Health Technology Assessment methods². Randomized controlled trials and other rigorous evaluation of rehabilitation technologies are often not available for new technologies, therefore, adherence with fundamental rehabilitation and neuroplasticity principles are important assessment considerations.



(left to right) Quentin Ranson, Michelle Annett, Jonathan Halton.

Next Steps

Formulation of the adoption and evaluation components of the implementation plan is ongoing. An occupational therapist and a physical therapist have been seconded to lead the adoption efforts. These two will provide the extra training and setup support needed in this early implementation phase. An evaluation team has been formed to consult with users and begin to formulate evaluation strategies. New technologies are able to provide new rehabilitation measures (motion path, response times, forces) and these afford a new set of evaluation criteria. It is only through the clinical application onsite at the Glenrose that effectiveness and utility of proposed innovative technology can be proven and thus reveal the results of the knowledge transfer initiative.

Key Messages

We asked staff about the challenges and/or barriers to the successful implementation of emerging technology. The predominant responses centred around the time and staffing resources required to learn and use technology. The comfort level of the staff with technology and generational differences in attitudes regarding technology were also perceived barriers. The ultimate acceptance of rehabilitation technology will depend on its ease of use and its ability to deliver functional benefits.

The knowledge transfer process is still ongoing. The opening of the first phase of the Courage Centre technology hub is planned for fall 2010. Key lessons learned thus far are that staff must be involved in the process from the beginning and must have a role in the decision making.

About the Author

Jim Raso is the manager of Research and Technology Development at the Glenrose Rehabilitation Hospital. A major initiative at the Glenrose is the Courage Centre, where the latest technology will help patients in rehabilitation, as well as their families, live their lives to the fullest. The Centre will be the hub for new state-of-the-art equipment and technology and will set new standards of rehabilitative care and learning, in addition to being known as a centre of innovation and research. The Courage Centre was made possible by the Glenrose Foundation's \$4 million fundraising initiative.

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Prosthetics, Specialty Seating, and Orthotics in the Digital Age

Andreas Donauer

Abstract

Traditional techniques in the production of artificial limbs (prosthetics) and supportive and corrective devices (orthotics) rely upon a labour intensive carving process carried out by skilled professionals. The prosthetics and orthotics staff at the Glenrose Rehabilitation Hospital have taken a leadership role in the integration of emerging technologies that have significantly improved the effectiveness and efficiency of design and fabrication. Moving a traditional practice into the digital age is a major undertaking that requires a significant change in staff mindset and a totally new approach to workflow. To succeed in this transition, an integrated KT approach was taken in which the end-users of the technology were engaged in assessing the state of the science, determining areas of practice that would most benefit, and implementing the changes. Evaluation is ongoing, but preliminary results indicate a reduction in manufacturing time, and an increase in patient satisfaction as they experience a more rapid return to function and participation in life activities.

Background

Moving a prosthetics and orthotics practice into the digital age is a major undertaking. It requires a significant change in the staff's mindset and a totally new approach to the workflow of the area. The prosthetics and orthotics staff at the Glenrose Rehabilitation Hospital (GRH) have taken a leadership role in the adoption and integration of computerized technology into clinical practice that has significantly improved the effectiveness and efficiency of designing and fabricating both artificial limbs (prosthetics) and devices that support or correct the function of a limb, the torso or the shape of the head (orthotics). Traditional clinical practices were labour intensive, time consuming, and lacking in precision, given that they depended on the naked eye and personal hand carving abilities for device fabrication.

In the three years that have passed since the orthotics, prosthetics and specialty seating department at the Glenrose began the transition to digital processes there have been many hurdles and some growing pains. However, the results of some hard work by members of the department are on their way to paying dividends in terms of improved patient care and improved workflow in the department. In order to understand the leap that this transition has entailed, a brief history of the practice in this obscure field is necessary.

Historical Perspective

The Prosthetics, Orthotics and Seating field arose historically from the needs of treating injured veterans of past wars or patients suffering from a wide range of bone, muscle, or nerve conditions, such as polio. For hundreds of years these patients have been fitted with artificial limbs and other mechanical devices, such as wheelchairs and braces, to assist them with their mobility. The fabrication of these devices was initially done by a variety of tradespeople who had the necessary skills or an interest in helping this patient population.

Under the direction of a physician, metal workers, carpenters, and mechanics (as they mostly were) used basic measurements taken from the patient and available parts to fashion the best devices possible at the time. In the 1960s and 1970s the Prosthetics, Orthotics and Seating field started to become more organized and some new materials and technologies became popular. The first improvement on measurement and fabrication came from the use of plaster of Paris molds to improve the fit of the devices made from the new heat-moldable plastics that were becoming available at the time.

Also at this time the training of practitioners moved to a more professional level with the arrival of master craftsman from Europe and the involvement of scientists and engineers in the field. (Practitioners were first certified in Canada in the early 1980s.) However, this represented the state of affairs for the next 30 years. While computers, robots, and other new technologies were radically changing factory floors, plaster of Paris molds remained the state-of-the-art for measurement and fabrication in the Prosthetics, Orthotics and Seating field through the 1980s and 1990s.

KT Initiative

Although the 1980s and 1990s also saw some early attempts at introducing digital methods of measurement and fabrication to the field, these attempts mostly failed due to the cost, complexity and difficulty of adapting the technology to the specific needs of the Prosthetics, Orthotics and Seating field.

The last ten years have seen these digital technologies mature considerably with respect to how they can be used in the Prosthetics, Orthotics and Seating field. In 2007 the Glenrose Hospital Prosthetics, Orthotics and Seating department decided to assess the potential for adopting these technologies for the purpose of improving patient outcomes and workflow. Interest in the technology peaked when a number of staff members attended the 2007 International Symposium on Orthotics and Prosthetics held in Vancouver, BC. A number of vendors at the symposium demonstrated, for the first time, hand-held laser scanning topography as well as software for digitally sculpting in three dimensions. Also competitively priced CNC carving machines for the production of molds were now becoming available. It seemed as though the technology was finally ready for practical use.

KT Strategy

A process was then begun by members of the department where the needs of the department were assessed and compared with cost factors related to various options. The areas of practice that were identified as likely benefiting the most from the technology were prosthetic limb fitting, spinal scoliosis brace fitting, infant head-shaping helmets, and contoured seating for wheelchairs. This represented some 50% of the department's activity. Among the benefits that were expected from utilizing digital measurement and fabrication processes in these areas were: reduced waiting times for patients awaiting fitting with a device; reduced return visits by patients for device adjustments to relieve pressure points; improved correction of spinal deformities; and reduced stress experienced by infants who had traditionally been measured by plaster of Paris mold. Along with these benefits a number of secondary benefits were considered likely. These included the potential for using this objective measurement technology for evidence based practice through systematic case reviews, and even reduced occupational hazards from manipulating heavy and awkward plaster molds, to name just two.

Facilities of the Future



(Right) David Homes
(Left) Andreas Donauer

Evaluation

The use of digital technology has continued to evolve regarding its applications. External skin scanning devices, software, and computerized carving systems now support a seamless workflow from the capture of limb and body shapes, to shape modification and device fabrication. From an outcomes perspective, clients experience less stress, a more rapid return to function and participation in life activities, and high satisfaction with the services received.

Although many of the outcomes hoped for are still under review, some early results include between 30% and 80% reduced wait times for inpatient prosthetic limb fitting. Some temporary limbs can now be fitted the same day. Workflow times for spinal brace and infant head shaping helmet manufacturing have been reduced by an estimated 25%. Because time was required to train five staff members in the use of the technology, it is anticipated that even greater access will be realized in the coming year. Specific outcomes related to spinal bracing and infant head-shaping are expected to be part of upcoming studies.

Next Steps

The prosthetics and orthotics staff have consistently demonstrated leadership in the acquisition of new knowledge related to the use of digital technology. Besides meeting their own learning needs, the staff have contributed to the hosting of a national workshop that focused on best practices in amputee patient management. They have also been involved in telehealth sessions related to the discharge of patients back to their communities, where the focus was on ensuring staff readiness and understanding to provide the required clinical interventions, follow-up, and monitoring.

Today we have reached the age where the customization of consumer products is becoming more common. The Prosthetics, Orthotics and Seating field has always provided custom devices for the care of its patient population. With these new technologies, and even newer ones to come, the mandate of the field to provide the most functional, aesthetic, and comfortable device, will be increasingly possible to fulfill. Future developments in three-dimensional digital printing may even make it possible to push a button and have a device appear before your eyes. What would the Prosthetics, Orthotics and Seating craftsman of the past have thought?

About the Author

Andreas Donauer, C.O.(c), M.Eng., B.Sc., graduated from both bachelor's and master's programs in engineering at the University of British Columbia in 1990 and 1992 and pursued a career in a health care field that provided direct interaction with patients and use of his newly gained technical knowledge. After further training in orthotics and prosthetics from George Brown College, Andreas moved to Edmonton to work with orthopaedic patients. In his years working at the Glenrose Rehabilitation Hospital since then he has been involved in the care of countless patients needing very specialized orthotic treatment, administrative initiatives, teaching opportunities, and projects involving engineering knowledge.



Evidence-Based Decisions for an Innovative South Health Campus

Tracy Wasylak, Shandra Kimpton, Jeff Caird, Ted Braun, Joanne Aimee, and Ken Chiang

Abstract

The South Health Campus (SHC), scheduled to open in 2011, is an academic tertiary healthcare centre that provides a unique opportunity to improve the quality and safety of care through evidence-based design. To achieve this end, a partnership was created between SHC, the Ward of the 21st Century, and the University of Calgary to translate human factors knowledge into the facility design. In order to collect evidence for the new facility, “mock-up rooms” were built for outpatient exam, emergency department, acute care, and intensive care. In each room a series of scenarios was simulated involving healthcare providers, patients, and family members. Evaluation focused on the design and functioning of the rooms, and several hundred recommendations were made regarding access, communication, visibility, and usability. The authors conclude that this initiative created a unique knowledge translation opportunity to improve patient safety and architectural usability through evidence-based design.

Background

Building a new hospital presents a unique opportunity to improve the quality and safety of care through evidence-based design.¹ The South Health Campus (SHC), scheduled to open in 2011, will become a large academic tertiary healthcare centre. As a green field site, the SHC represents a unique opportunity to improve health service delivery and facility design through evidence-informed decisions.

While there is a growing body of evidence to guide health service delivery planning, clinical process improvement, and facility design, in many instances there is a lack of trusted sources of information that provide high quality evidence to inform planning. Evidence, when available, requires appraisal to determine how best to apply it to the local system.



South Health Campus

KT Initiative

To address the identified needs, an applied research partnership between the South Health Campus Project Team, the Ward of the 21st Century (W21C) (www.w21c.org), and the University of Calgary was formed to translate human factors knowledge and expertise into the design of the SHC. In this way, answers to some of the key design questions facing the SHC Project Team could be answered through scientific enquiry by the research partners working in collaboration with decision-makers and clinicians. The objectives of the initial project for this new partnership, the “mock up project,” were aimed at answering specific facility design questions while the objectives for the overall initiative were longer term and broader, to include questions pertaining to both facility design and service delivery. The objectives for this initiative are summarized in Table 1.

Table 1: Summary of Objectives and Desired Impact.

Objective	Desired Impact
<p>1. Using simulated patient care scenarios and human factors analysis, provide evidence to architects, builders, and decision-makers to inform the design of the SHC.</p>	<p>A process of rapid integrated research led by the W21C human factors team resulted in ‘just in time’ design changes, such as:</p> <ul style="list-style-type: none"> • relocation of headwall in inpatient care room • adapting counter space and workspace for professionals • redesign of bathroom access and orientation <p>Due to the success of this initial project, this process and methodology is now being utilized to help inform the selection of specific technologies and equipment and the evaluation of clinical workflows within an acute care environment.</p>
<p>2. Develop a sustainable knowledge exchange relationship (or partnership) between the SHC Project Team (the decision-makers), clinicians (the users), and the W21C (the researchers).</p>	<p>This initial project allowed stakeholder groups to form and develop a collaborative way to work together to achieve project objectives. As the project progressed, the knowledge exchange relationship matured and resulted in additional projects, one of which has been completed and several more of which are currently being planned.</p> <p>The early success has allowed the team to build on each project and move from physical design problems to clinical workflows and technology issues.</p>

Methodology

Knowledge Exchange Collaboration: A formal organizational structure, including a steering committee and working groups, was established to plan and execute this initial project and with the intent of establishing a sustainable relationship between the W21C and associated researchers and SHC leadership. A formal project charter, developed jointly by all stakeholders, clearly stated the objectives, work plan, and deliverables, along with the roles and responsibilities of the various stakeholders. This helped establish the new relationship as well as plan and deliver the mock-up project.

Mock-Up Project: Human factors, patient simulation, and usability engineering methods were used during the evaluations.² A set of mock-up rooms were built at the SHC for the purposes of evaluation and tendering of bids. The four rooms that were evaluated included an outpatient exam room, an emergency department exam room, an acute care inpatient room, and an intensive care unit room. Each room was equipped with four audio and video microphones and cameras, which were used to code beneficial and problematic designs. When the SHC is completed, these four room types will comprise a total of 900 rooms in the new hospital.

For each of the rooms, several patient scenarios were simulated to stress the design of each room by having patients, family, and healthcare providers interact with integrated medical equipment, aspects of the room, and one another. All necessary equipment was included within each of the mock-up rooms so as to nearly replicate functioning spaces. Scenarios were run with simulators such as the METI ECS Stan and Baby Ryan and with standardized patients or actors. Citizens and healthcare professionals volunteered to participate in the evaluations and included patients, doctors, nurses, respiratory technicians, and physiotherapists. The scenarios that were run included a code blue situation, a central line insertion, a patient lift, a patient admission, a pediatric lumbar puncture, and a chest tube insertion. After each scenario was completed, participants were engaged to critique aspects of the room that were advantageous and those that conflicted with the work activities in the scenario. The emphasis of the evaluation was on the design and functioning of the room and not on the performance of the healthcare professionals, which is an important element of the evaluation protocol. The feedback resulting from these conversations, coupled with the analysis of the video of each scenario, were used to make recommendations for changes in design.

These recommendations were vetted through a steering committee, consisting of members of the SHC Project Team and the Research Team. This approach provided excellent communication between the collaborating partners and facilitated quick decision-making and translation to the design team for making changes.

Audience

The intended audience for these results are decision-makers who are responsible for designing and building (or renovating) health care facilities, “the users” (patients, families, and clinicians) and researchers who work in a wide variety of areas related to facility design and health services delivery. This project demonstrates the value of a collaborative relationship between these groups.

Frequently, decision-makers and researchers struggle to find ways of working together effectively to achieve their respective goals. A variety of approaches to link research to action have been proposed. One model is led by research producers/purveyors “pushing” knowledge to the users, while the “user-pull model” involves decision-makers reaching into the research world to extract information. A third model, the “integrated” approach, involves a partnership between the users and researchers.³ Our early experience with the knowledge exchange relationship between the SHC Project Team and the W21C, along with its associated researchers, is a feasible model for others seeking evidence to improve healthcare.



Team works with simulator. Elise Teteris (left foreground) Alecia Greenough (right foreground) and (left to right in lab) Andrew Mayer, Nicole Percival, Aimee Pearson, Susan Midekiss

KT Strategy

The knowledge exchange relationship inherently engages decision-makers and researchers while the design of specific projects, such as the mock-up project, engages patients, families, and clinicians. Our experience suggests that engagement throughout the process is important. From the point at which the research question is defined through the analysis and application of the results, all stakeholders add value.

Results

The mock up phase of the research has been completed and was deemed a success. Audio and video data was collected for each scenario, was coded into a set of categories by a number of researchers, then recommendations for design change were proposed. The categories included access issues, collision with equipment, communication issues, visibility, clutter, congestion, and usability issues, among others. Across the four rooms, several hundred recommendations were made and were weighted according to supportive evidence.

Subsequently, the recommendations for each room were reviewed together with architects, builders, and decision-makers to determine which could be implemented immediately (71) and which others required additional follow-up. Some recommendations, such as changes to the acute care patient bathroom and the intensive care unit steel support structure, were made within a week of each evaluation to meet the construction schedule. This approach had a substantial impact on both design and engagement.

Key Messages

The collaborative partnership between the W21C and the SHC project team creates a unique knowledge translation opportunity in which the decision-makers, the researchers, and the clinical providers work collaboratively throughout the research process to achieve a mutually beneficial research and clinical agenda.

The human factors and patient simulation methods used to evaluate the rooms represent a new means to determine patient safety and architectural usability of healthcare environments under tight time constraints. The methodology used to evaluate the SHC can also be used to acquire evidence to inform health system and facility planning. An interventional operating room, intensive care unit room designs, and long term care facilities have also been evaluated using the methods developed during the course of this project.

Acknowledgements

We are grateful to the capital construction team at Ellis Don for numerous accommodations during the course of these evaluations. We wish to thank all of the individuals who organized and coordinated the evaluations of the mock-ups. In addition, we are grateful to the many citizens and healthcare professionals who participated in and contributed to the evaluations.

About the Authors

Tracy Wasylak is the operating Vice President in charge of the South Health Campus (SHC) Project. Dr. Ted Braun has been a Senior Vice President with the SHC from its inception through design and operational planning. Shandra Kimpton, Administrative Director, Ward of the 21st Century (W21C), is a member of the SHC Clinical Design Team and instrumental in the development of the knowledge exchange relationship. Dr. Jeff Caird is a Professor in the Department of Psychology and an Adjunct Professor in the Faculty of Kinesiology and the Department of Anesthesia, University of Calgary and is the Director of the Healthcare Human Factors and Simulation Laboratory located in the W21C Research and Innovation Centre. Dr. Caird has worked closely with the SHC Team to provide his human factors expertise and to support the knowledge exchange relationship. Joanne Aimee is a consultant who provides project management office support. Ken Chiang is responsible for the Capital Construction Project and instrumental in building the mock-up simulation rooms at the SHC.

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Relieving the Pressure: A Collaboration in Pressure Ulcer Prevention

Jill de Groot, Shandra Kimpton, Mona Motamedi,
Elise Teteris, and William A Ghali

Abstract

Pressure ulcers are a significant concern within Canadian healthcare institutions. The Ward of the 21st Century (W21C) and XSENSOR Technology Corporation partnered in the design and testing of an Intelligent Turn Manager technology. This technology allows care providers to visually identify an area of persistent pressure and enables them to strategically shift a patient to provide effective relief. In order to assess the usefulness of the technology and its impact on healthcare practices, W21C utilized focus groups, heuristic evaluation, and pilot testing. Engaging healthcare providers was essential, as frontline staff identified gaps in current prevention strategies and implementation barriers, generated knowledge on the benefits to patient care, and evaluated various prototypes. The authors conclude that by developing a partnership between researchers and industry, and by collecting extensive feedback from end-users, this initiative has brought us closer to decreasing the occurrence of pressure ulcers amongst patients in the healthcare system.

Background

The Ward of the 21st Century (W21C – www.w21c.org) is a research and innovation initiative based at the University of Calgary (U of C) and in the Calgary zone of Alberta Health Services (AHS). The W21C has both a state-of-the-art medical ward based out of the Foothills Medical Centre in Calgary, Alberta (opened in 2004) and as a Research and Innovation Centre in U of C's Faculty of Medicine's Teaching Research and Wellness building (opened in 2009). The guiding principle behind the W21C's collaborative Living Laboratory is the belief that truly transformative research requires enhanced contact between researchers and healthcare professionals. Cooperation and collaboration are enhanced through a combined research and clinical space that supports interprofessional teamwork. This scope of knowledge in the context of a shared focus on safety and quality of care produces a unique and exciting opportunity for innovative research and clinical care practices to emerge.

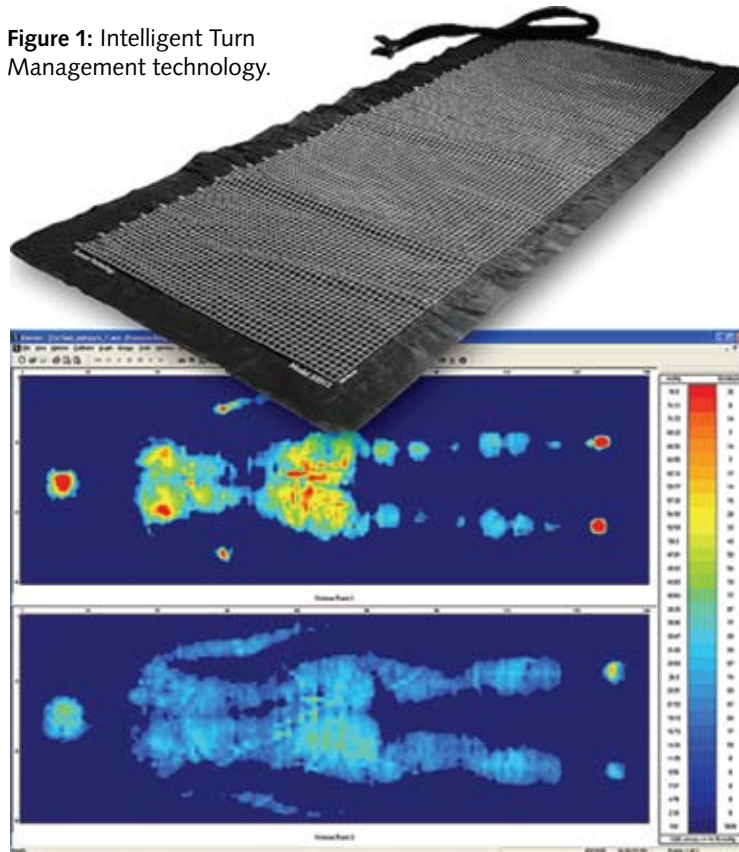
Collaboration

In late 2007, an opportunity arose for the W21C to participate in the development and testing of a health innovation. The W21C and XSENSOR Technology Corporation partnered on a research and development project funded by PRECARN and the Alberta Ministry of Advanced Education and Technology. XSENSOR is an Alberta based company that designs, manufactures, and sells advanced pressure-imaging systems for use in medical environments worldwide. This collaboration was one of the first of its kind for Alberta Health Services, laying the administrative pathways for future ventures. It was made possible through the partnership between government, industry, academia, and healthcare.

Facilities of the Future

The purpose of the project was for W21C to assist XSENSOR in the design and testing of an Intelligent Turn Manager technology. This project, which was conducted between 2007 and 2010, entailed focus groups, one-on-one meetings with clinicians, W21C leads and managers, usability testing sessions, and heuristic evaluations for iterative technology development, and concluded with a pilot and a natural history study.

Figure 1: Intelligent Turn Management technology.



KT Objective

The main objectives of this initiative were twofold: (1) to assess the impact of the technology on practices around the prevention of pressure ulcers by providing healthcare providers with a visual tool to assist in patient shifting, and (2) to evaluate a new Intelligent Turn Management System.

Importance of Technology

Pressure ulcers or “bed sores” are a significant concern to Canadian healthcare institutions. A 2004 review of the data from 65 Canadian health care settings (including acute, non-acute, mixed, and community) estimated that one in four patients in acute care and one in three patients in long-term care develop pressure ulcers, with the prevalence across all institutions estimated to be 26%^{1,2}. Pressure ulcers are caused by an applied pressure on one part of the body for an extended period of time constricting blood flow to that location, which causes tissue breakdown. Even with treatment, ulcers can lead to severe complications such as septicemia, amputation, or death. Currently, clinicians monitor ulcer risk periodically using labour intensive manual techniques (i.e., shifting patients at regular intervals). This approach is increasingly difficult with patients who have limited mobility (for example, critically ill intensive care unit patients, spinal cord injury patients, people with neurological impairments, and cognitively impaired adults).

XSENSOR has developed technology that may assist with pressure ulcer prevention. Specifically, the company has developed a novel system that allows healthcare providers to visually identify an area of persistent pressure on a patient's body, thereby enabling workers to strategically shift a patient to provide effective relief of that pressure. Combining sensors, software and electronics that can be installed on any hospital bed, the system continuously monitors bed surface pressure and generates easy-to-interpret bedside images. The system also includes an adjustable patient turn interval timer, which can assist with management of the patient turn schedule.

The Project

As previously stated, the collaborative project involved three phases: (1) focus groups, (2) heuristic evaluation and usability testing, and (3) pilot testing and a natural history study.

Focus Groups

Numerous focus groups occurred with nurses, physicians, occupational therapists, physiotherapists, and other wound-care providers at Foothills Medical Centre. The focus groups connected XSENSOR directly with the end user to obtain user perceptions of the technology. Participants were engaged in discussions about the population of patients for whom this technology might be appropriate as well as features of the technology the participants found useful and easy to understand and those that should be altered or removed. The objective of this phase was to collect recommendations regarding the content and interface of the XSENSOR technology. The knowledge translation relationship between W21C and XSENSOR facilitated a rich knowledge exchange that an industry partner would otherwise have had difficulty obtaining.

Heuristic Evaluation and Usability Testing

The second phase of the project involved heuristic evaluation and several rounds of usability testing, completed by the W21C's healthcare human factors group. The goal of heuristic evaluation is to systematically inspect a user interface as a way to find any usability problems within the system. The findings provided guidance to future changes in the software's interface. Usability testing was conducted using an updated design of the software with nursing students and nurses in a simulated patient care environment. Further recommendations were generated regarding the software design, interface changes, and system set-up and tear-down.

Pilot and Natural History Studies

The project concluded with implementing the technology on an acute care in-patient unit using a pilot study, as well as a natural history study. The pilot study involved the use of video recording before and after implementation of the technology to see if the technology influenced patient care in any way, with a specific interest in patient shifting. A comparison of the data before and after implementation revealed that there were a significantly greater number of two-person assisted shifts, including patient transfers off the bed for pressure relieving purposes, following the implementation of the technology. Qualitative feedback was also gathered from healthcare providers throughout the pilot study. Overall, feedback was very positive with providers stating they "absolutely love this thing," "the system provided good feedback," and they "really liked the system." Following the pilot study, a natural history study was conducted. The term 'natural history' is used to describe how the technology was continuously recording data, but the data output monitor was unavailable, preventing health care providers from clinically intervening in any way. Following the collection of data from the sensor, a multi-disciplinary patient case review involving the industry partner and the W21C clinicians occurred to determine if the information provided by the sensor correlated with the clinical profile of the patient (i.e., if the patient had left-sided paralysis, did the technology show very little movement on the patient's left side). This unique methodology brought together the industry partner with a multidisciplinary panel, ultimately providing rich dialogue and data that informed further iterations of the prototype.

Knowledge End-Users Driving the Research

Health care providers were involved throughout the process of research. Specifically, they identified gaps in pressure ulcer prevention strategies, generated knowledge surrounding the benefits of the technology to patient care, and have evaluated the various prototype designs of the technology. By developing relationships with healthcare providers throughout the project, insight was gained on both the design of the technology as well as “on-the-ground” delivery. In addition, by integrating the knowledge of the end-users into the research process, the resulting design of the technology was tailored to the target audience. As a result, the technology was practical and useful for the end-users. In addition, input from healthcare providers into the design process identified possible barriers to implementation as well as recognizing critical changes that were necessary to support a successful adoption from healthcare providers. As a result, necessary changes could be made to the prototype prior to implementation with real patients on the medical unit.

Key Messages

The project illustrates success in a number of areas. First, throughout all phases of the research, XSENSOR was provided with extensive feedback from end-users as well as data from real patients in a clinical setting. The research also provided a foundation of knowledge for future intervention trials and imparted a greater understanding of the applicability of the device to the clinical setting. Third, the project illustrates the key relationships that can be developed between a research team and industry partners. With a wide breadth of knowledge stemming from the team, the W21C was able to engage with XSENSOR on a productive and successful project. This relationship has developed into a successful partnership that will continue to develop throughout additional phases of research. Further, as a result of the rich results gained throughout the project, XSENSOR has been able to design a new prototype of the Intelligent Turn Manager. The next phase of research will again involve focus groups with key healthcare providers, usability testing of the new prototype and a smaller pilot study, and will be funded by PRECARN and Alberta Advanced Education and Technology. Finally, our initiative has put us one step closer to our ultimate goal of decreasing the occurrence of pressure ulcers in patients within our healthcare system.

About the Authors

Jill de Grood is a research associate for the Ward of the 21st Century (W21C) with a background in sociology. Her interests include healthcare provider well-being and examining the effectiveness of healthcare innovations. Shandra Kimpton is the administrative director of the W21C with a background in clinical engineering as well as in conducting and coordinating research. Mona Motamedi is a research associate with Alberta Health Services. Motamedi's background is in community health sciences and she is currently working with a patient safety portfolio. Elise Teteris is a human factors and simulation research associate at the W21C. Teteris' interests include medication errors, the incorporation of usability and workflow into the design of hospital rooms, and interprofessional communication. Dr. William Ghali is a professor of Medicine and Community Health Sciences, University of Calgary. Dr. Ghali is director of the Calgary Institute for Population & Public Health.

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Developing the Web-Based Seamless Discharge Communication Tool

Mona Motamedi, Charlotte Tang, Shandra Kimpton,
and William Ghali

Abstract

Discharge summaries are a primary means to convey information regarding a patient's hospitalization. However, problems with completeness, timeliness, and a lack of standardization of manually generated summaries can create a barrier to appropriate care. A collaboration between the Ward of the 21st Century (W21C), and Clarity Inc., sought to address this problem through the creation of a Web-Based Seamless Discharge Communication Tool. Electronic discharge summaries can be structured to ensure that critical data about the hospitalization is consistently documented and can be transmitted instantly via the internet. This innovative program has used an integrated KT approach in engaging end-users in all stages, from identification of knowledge needs to implementation and evaluation. The authors conclude that successful and highly productive partnerships that address healthcare challenges can be built between universities, industry partners, and health organizations. These relationships can be complex and require special attention to the interests of each party.

Background

Information about a patient's hospitalization is commonly transferred to the primary care physician via a discharge summary.^{1,2} This is typically a manually generated document in a narrative or semi-structured format. Content may include: diagnosis, medical history, brief hospital course, treatment provided, diagnostic/laboratory results, discharge medications, and follow-up needs. The document is then generally faxed, mailed, or given to the patient to hand deliver to their primary care physician.

Major deficits exist with respect to the adequacy of content and timeliness of information transfer with these manually generated discharge summaries.^{1,2,3,4,5,6,7} Lack of a standardized structure has resulted in either too little documentation or excessive and irrelevant documentation. Inaccurate, inconsistent, and misleading content is also often included. Hospital physicians most often neglect to include diagnostic findings, treatment/hospital course, discharge medications, tests results, and whether the patient and family received counselling.^{1,2} As few as 12% to 34% of summaries are received by the primary care physician in time for the patient's first post-discharge appointment and, in many cases, the discharge summary is never received.^{1,2,6-8} This lack of access to information at the community level is a barrier to appropriate care for approximately 25% of patients.^{1,2}

Electronic discharge summaries may represent a solution to these issues because they improve legibility and timely delivery, and can be structured to ensure consistent critical data about the hospitalization is documented for each patient.^{1,2,4} Information can be transmitted almost instantly via the internet or by automatic fax. Additional content such as laboratory and diagnostic findings, allergies, and medication lists can be uploaded in seconds from hospital databases and physician order entry systems.^{1,2} Storing data electronically or in internet data repositories is secure, practical, and often does not require the user to have any special training or to acquire additional software. Finally, there is mounting evidence that physicians in both acute and community settings prefer electronic discharge documents over hand written/dictated summaries with respect to clarity, comprehensiveness, and positive impacts on continuity of care.^{7,9-13}

KT Objectives

The objectives of our research were to:

1. Investigate the communication gap between hospital and community care providers identified in the international literature as well as within Alberta Health Services (AHS) through a qualitative descriptive study. This goal of this phase was to inform continuing research and potentially inform policy decisions.
2. Conduct a systematic review of the efficacy of computer-enabled discharge communication compared to traditional communication for patients discharged from acute care hospitals with respect to mortality, readmission, and adverse events, as well as several key secondary outcomes. The goal of this phase was to add to the body of knowledge that will inform future research.
3. Collaborate with a Calgary-based company, Clarity Inc., to develop a highly functional and user-friendly electronic discharge summary that can be marketed to other hospitals/health organizations on a provincial, national, or international level.
4. Integrate the electronic discharge summary into the AHS computer infrastructure (Sunrise Clinical Manager 5.0), thereby changing the practice of how patients are discharged.
5. Provide an evaluative framework for the new electronic discharge summary through a pilot test protocol and a formal clinical trial protocol.

Audience

Traditionally, only the discharging physician and the primary care physician exchange information about a patient's hospitalization. This research identifies many other previously overlooked, yet critically important stakeholders and provides a mechanism for these individuals to become engaged in this communication circle. The target end-users of this research are hospital care providers (physicians, residents, nurses, allied health professionals, transition services staff, hospital management), and community care providers (primary care physicians, pharmacists, home care nurses), as well as patients and their families.

There are a number of barriers that must be overcome in order to effectively link care provider groups. Some of these include balancing access of records with protection of private health information, addressing different levels of access to (and knowledge of) computer technology, and integrating new software with existing hospital/community information systems to ensure accurate information and reduce duplication of work. Once new technology is successfully implemented, other key factors such as strategic thinking, strong leadership, collaboration with stakeholders from an early stage, communication, and coordination, must be in place to ensure improved patient outcomes.^{10,14}

KT Strategy

This innovative program of work has been conducted with ongoing knowledge translation occurring at all stages. The end users described above were initially consulted to identify data requirements, and were then engaged in a process of co-developing the seamless discharge communication tool by providing extensive feedback in nine focus groups.

The work has been conducted as a committed partnership between the Ward of the 21st Century initiative, the University of Calgary, and champions within Alberta Health Services, who have brokered the significant in-kind support that is now permitting the build of the Seamless Discharge Tool into the Calgary zone computerized physician order entry system (SCM 5.0). The final evaluative component of this research will again involve clinical end-users and patients to provide nationally and internationally novel evidence regarding the efficacy of such information tools for improving health care delivery.

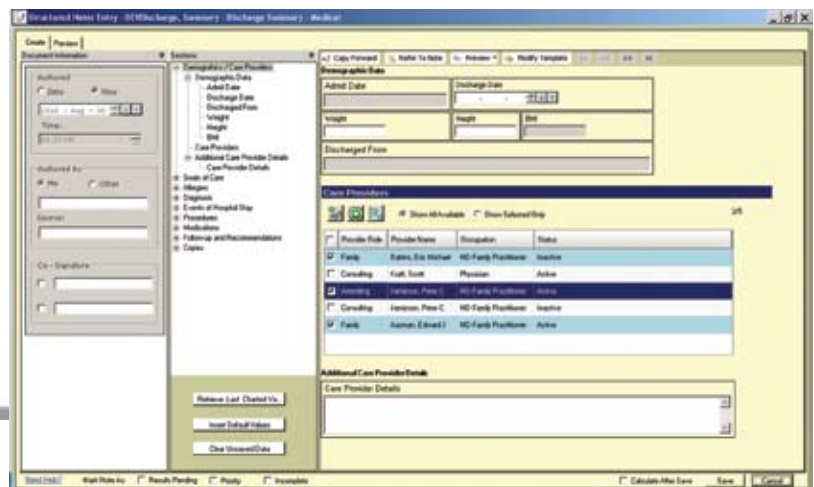
Other KT strategies that have been used include targeted face-to-face meetings, conference presentations, submission of findings to peer-reviewed journals, and interviews on CBC radio.

Results

Overall, the project has been successful to date in that:

1. A thorough understanding of the communication gap between hospital and community care providers has been accomplished along with identification of five themes and 11 concrete recommendations that can improve the overall quality of communication and the value of the discharge summary.
2. The efficacy of computerized discharge interventions has been described and critical endpoints that are not well understood have been identified for future research to address.
3. The Web-Based Seamless Discharge Communication Tool, an innovating electronic discharge summary, has been developed. This electronic discharge summary will: a) provide a standardized template for a multi-disciplinary group of care providers to communicate relevant clinical information; b) be immediately available at time of discharge; and c) be web accessible to community-based providers (primary care physicians, specialist consultants, home care nurses, community pharmacists), and patients/families.
4. The AHS Seamless Discharge Summary was built on the foundation of the work done in earlier stages of this research and the new tool has been integrated into Sunrise Clinical Manager (SCM 5.0) in collaboration with the AHS Information Technology (IT) Department.
5. The final evaluative phase of this work is set to commence in November 2010. It will involve a pilot test of the AHS Seamless Discharge Summary with 100 actual patient discharges. It will involve formal usability testing as well as a detailed assessment of provider and patient satisfaction with the discharge tool and with the completeness and timeliness of discharge summaries produced. This will then be followed by a formal prospective clinical trial involving 1,400 patient discharges. The trial will evaluate the efficacy of the prototype with respect to reducing hospital readmission and mortality (at three months), adverse events, and adverse drug events.

Screen shots of both the Web-Based Seamless Discharge Communication Tool and the AHS Seamless Discharge Summary are provided below.



Key Messages

The key lessons learned from this initiative include the understanding that:

- successful and highly productive partnerships that address health care challenges can be built between universities, industry partners, and health organizations. These relationships can be complex and require special attention to the interests of each party.
- engagement of all key stakeholders up front and throughout the research process is critical to ensuring widespread ownership and eventual large scale uptake.
- electronic discharge summaries can provide a potential solution to some of the existing deficiencies in hospital/community communication.
- the electronic discharge summaries developed during this research can be implemented directly into other healthcare organizations

About the Authors

Mona Motamedi, M.Sc., currently works within the Patient Safety Portfolio of Alberta Health Services. This research was conducted as part of her graduate thesis work. Dr. Charlotte Tang (Ph.D., Computer Science) is a post-doctoral research fellow, University of Calgary, under the guidance of Dr. William Ghali. Shandra Kimpton, M.Sc., is the administrative director for the Ward of the 21st Century. Dr. William Ghali, M.D., M.P.H., F.R.C.P.C., is the director of the Calgary Institute for Population and Public Health as well as a physician with Alberta Health Services and a researcher within the University of Calgary.

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Smart Phone and Tablet-Based Teleradiology for Rapid Diagnosis

Jayesh Modi, Jaret Hargreaves, Kyle Peterson, Mayank Goyal, and J Ross Mitchell

Abstract

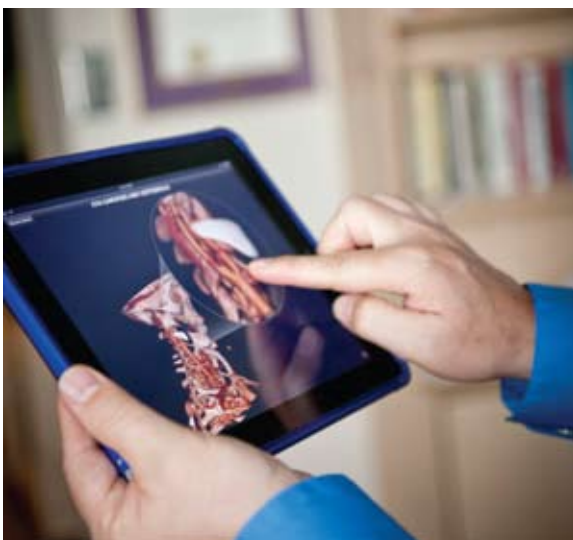
In emergency situations, rapid access to medical imaging informatics can be essential to providing timely and accurate diagnosis, and effective treatment. Current teleradiology systems face barriers to rapid deployment; medical images commonly need to be transferred to remote viewing devices, and physicians may have to travel to access these devices. A collaboration between Dr. Ross Mitchell's University of Calgary lab, and Calgary Scientific Inc., is working to provide physicians with immediate access to MII on their smart phones and tablet computers. Clinical trials are currently underway to evaluate the effectiveness of this initiative in stroke telemedicine, and commercial partnerships have been formed to distribute the software in as many as 120 countries. The authors conclude that interdisciplinary research and commercial partnerships are essential tools in translating medical research into improved health outcomes.

Background

Medical imaging informatics (MII) is a new, interdisciplinary field that uses electronic health information systems to help healthcare professionals and patients prevent, understand, monitor, and treat disease. According to a Price Waterhouse Coopers report, the market for MII in North America will grow to \$100 billion by 2015.

Accurate and timely diagnosis is important in emergency conditions such as acute stroke and trauma. Current teleradiology systems have several limitations that limit their utility for diagnosis and treatment in acute conditions. First, the systems may require that patient medical images be transferred to a remote device for viewing before interpretation can begin. The delay caused by transmission of the image data may significantly reduce treatment effectiveness. Second, it may also introduce a security risk since confidential patient data may be located outside the hospital firewall. Third, the devices used for remote visualization may limit or inconvenience physician mobility. This may result in additional delays while a physician on call travels to the nearest remote visualization device.

Mobile devices, such as smart phones, have become increasingly prevalent in modern society. Many doctors now carry one in their pocket. However, mobile devices may lack the computational capabilities to perform advanced visualizations that can aid the diagnostic process. In turn, this may prevent them from achieving functional equivalence to workstation systems, and make regulatory approval more difficult.

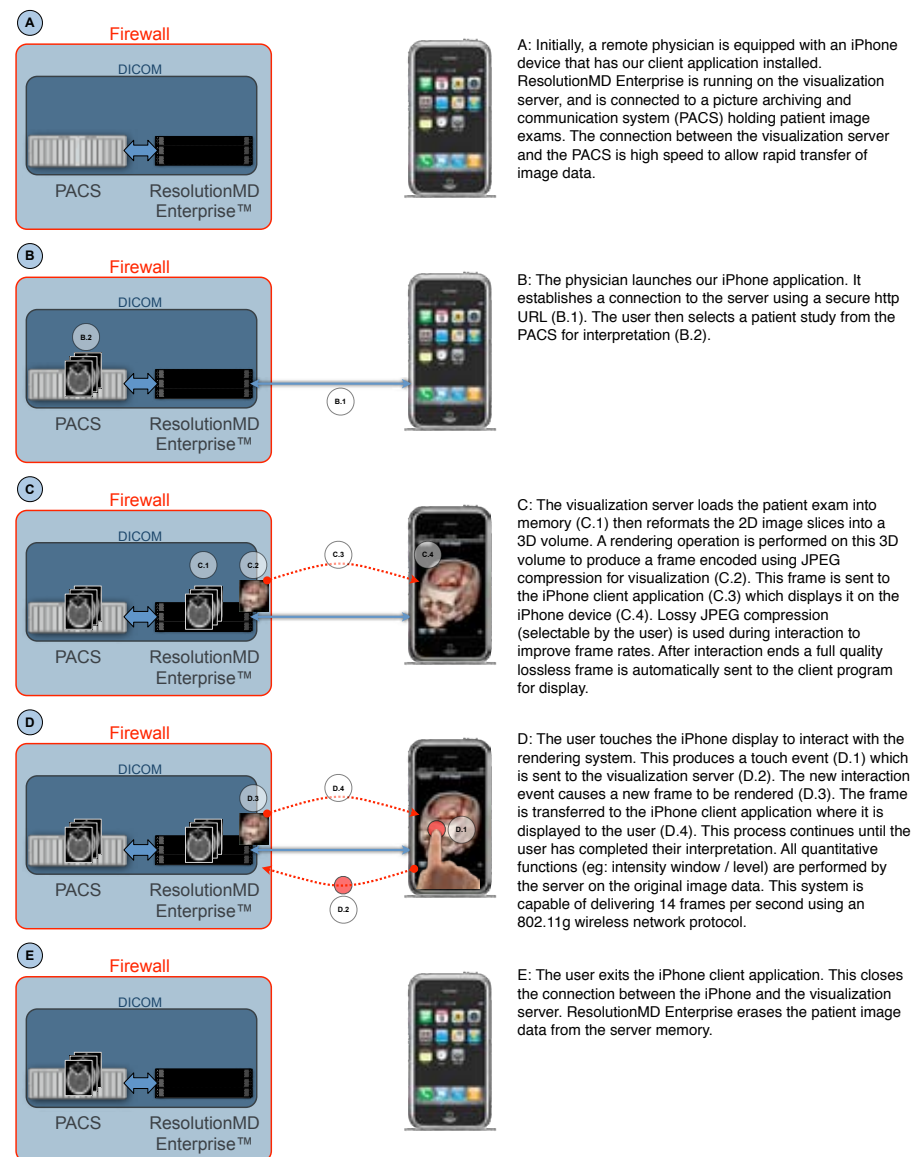


KT Initiative

We have developed a new teleradiology system based on a client / server architecture to address the limitations related to connectivity and confidentiality. Our system, described in Figure 1, includes a visualization server and a mobile device with custom client software (ResolutionMDTM Mobile, Calgary Scientific Inc.) running either the Android (Google Inc., Mountain View, CA), or the iOS (Apple Inc., Cupertino, CA) operating systems.

Our solution allows rapid, remote, secure, two-dimensional (2D) and three-dimensional (3D) visualization of medical images on a mobile device wherever wireless network connectivity is available. Additionally, our solution does not require patient data to be stored on the mobile device. This allows immediate visualization of new patient images from remote locations, an important feature when timely interpretation is crucial for appropriate treatment. It also aids security since no patient data is stored outside the hospital firewall. Our system allows devices such as Apple Inc.'s iPhone 4 and iPad to be used as secure remote "windows" into a ResolutionMD server that provides advanced visualization and analysis capabilities for patient images.

Figure 1: A schematic overview of our client / server teleradiology system.



Evaluation

We did a feasibility study on the use of iPhone-based teleradiology in acute stroke and acute spine trauma and compared the performance of radiologists reading on the iPhone to that of those reading on a standard clinical workstation. Radiologist performance on the iPhone was identical to that on a medical workstation.

Prospective clinical trials are currently underway at Foothills Medical Centre, Alberta Health Services (Calgary), the Mayo Clinic (Scottsdale, Arizona) and the University of Southern California (USC) to evaluate the iPhone teleradiology system in stroke telemedicine.

KT Strategy

Hospitals use a medical image database, called a Picture Archiving and Communication System (PACS), to store patient image exams digitally. A ResolutionMD server is installed in the hospital and networked to the PACS with a high-speed interconnect to ensure the most rapid transfer of images for viewing. The ResolutionMD server can then be made accessible to the mobile users by a variety of methods, depending on the existing hospital infrastructure and the required use case. When using only Wi-Fi connectivity within the hospital, the server can be made available on restricted networks allowing for in-place security measures—such as encrypted networks and user authentication—to be used to ensure the safety of patient information. To deploy access more broadly, a public-facing network address for the server can be configured, allowing use over cellular data networks including 3G and 4G. In either case, SSL-encrypted sessions and industry-standard firewalling methodologies can be utilized to augment the security of the solution.

Deployment of the mobile client software is straightforward. Users simply download the client software and all upgrades, using online marketplaces, such as Apple's iTunes App Store. In combination with user training, this easy-to-use, ubiquitously available method of deployment reduces the burden on IT groups to provision and support their own users.

ResolutionMD Mobile customer sites provide extensive training to support their use of the product. This includes live, online training sessions where mobile device simulation software is used to walk new users through the various product features and functionality. These sessions are recorded for viewing by users unable to attend the live training sessions and augmented by support packages that include call-in numbers to provide IT with front-line sales support.

Development of a custom client application provided several benefits, one of which was the ability to customize the graphic user interface for the multi-touch input system and the small display area. It also allowed us to implement custom optimizations to precisely monitor and manage communications with the server, enhance overall performance, and provide higher interactive frame rates. In our experience, a single visualization server can accommodate 10 or more simultaneous iPhone users and is capable of delivering and displaying up to 14 frames per second on an iPhone device connected over an 802.11g Wi-Fi network. The frame rate was enough to provide sufficient interactivity for comfortable use.

Barriers

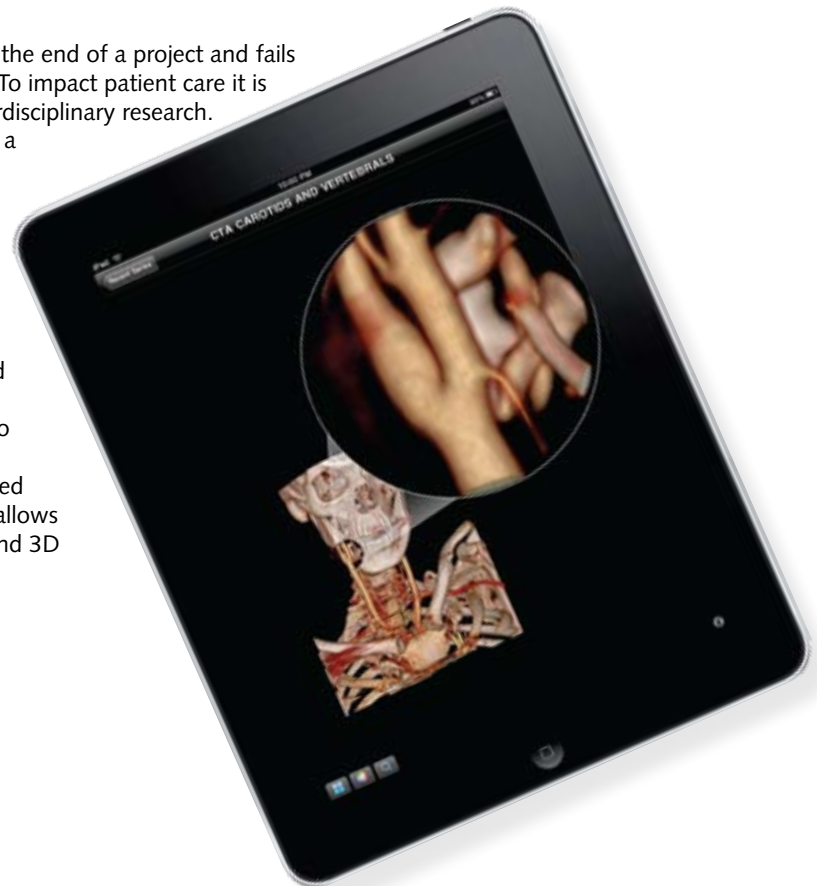
Our system has been approved as a medical device in Canada and has also received CE mark clearance in the European Union. However, it does not yet have approval from the US Food and Drug Administration. Therefore, it may not be marketed as a medical device in the US at the present time. We suspect that regulatory agencies will have two major concerns regarding this system: (1) that it has functional equivalence to previously licensed image interpretation platforms; and (2) that it unduly jeopardizes patient confidentiality. Our client / server architecture may help address each of these concerns. Protection of patient confidentiality is aided by the fact the no DICOM data is stored outside the hospital firewall on the mobile device. As well, since the server performs all rendering operations, it may be possible to expose sufficient workstation-class functionality on the mobile device to demonstrate functional equivalence. For example, the iPhone, and other current generation smart phones, do not have sufficient computational resources and rapid access memories to perform interactive multi-planar reformatting or advanced 3D visualization. Yet, these functions may be required by the regulatory agencies to demonstrate functional equivalence to existing interpretation platforms. We are investigating new methods to usefully expose additional advanced visualization capabilities to the remote user on an iPhone device and to optimize both server and client performance to enhance interactivity over both Wi-Fi and cellular networks.

With appropriate validation studies, this system might prove useful in other acute care scenarios, such as heart attack and trauma, where rapid access to image data is an important factor determining patient outcome. It may also be useful as a bedside teaching tool to help physicians communicate better with patients and their families.

Keys to Success

Research is often abandoned at the end of a project and fails to positively impact healthcare. To impact patient care it is necessary to commercialize interdisciplinary research.

The imaging informatics lab has a dedicated team of experts in mathematics, engineering, physics, computer science, medicine, radiology, aneurysmology. A synergistic collaboration between the laboratory of Dr. Ross Mitchell (Imaging Informatics, UofC) and Calgary Scientific Inc. (CSI) has commercialized MII research into ResolutionMD™ Mobile and ResolutionMD Web, a web-enabled medical software program that allows for remote visualization of 2D and 3D images on Apple's iPhone.



Results

Health Canada has approved ResolutionMD™ Mobile and ResolutionMD™ Web as a medical device in Canada. The European Union has given this software CE Mark certification. Seven patents have been obtained from the US Patent Office and a further nine are provisional. Partnerships have been formed with several companies, including Siemens Medical AG (Erlangen, Germany), Agfa Healthcare Waterloo (Waterloo, ON), and Sprint Nextel Inc. (Overland Park, KS), to distribute the software in as many as 160,000 healthcare facilities in 120 countries.

Key Messages

1. MII has the ability to transform healthcare delivery and improve patient outcomes.
2. Research is often abandoned at the end of a project and fails to positively impact healthcare.
3. To impact patient care it is necessary to commercialize interdisciplinary research.

About the Authors

Jayesh Modi, Mayank Goyal and Ross Mitchell are with the Department of Radiology, University of Calgary. Dr. Modi, a neuroradiologist trained in India, and is doing a post-doctoral fellowship in the Imaging Informatics Lab (IIL). Dr. Goyal is a staff neuroradiologist and the Director of Neuro-Radiology at Foothills Medical Center. Dr. Mitchell is a tenured full professor and head of the IIL. He is also the co-founder and chief scientist of Calgary Scientific Inc. (CSI). Jaret Hargreaves completed his M.Sc. in the IIL and is now a Product Manager at CSI. He oversees ResolutionMD Mobile. Kyle Peterson is the director of Corporate and Regulatory Affairs at CSI. He has overseen the regulatory approval of ResolutionMD Mobile and other products.

“From the golf course, the shopping mall, or across the world, a doctor with an iPhone will be able to start treatment for a patient with just a few screen touches.”

Short and Sweet: Humour in Science Communication

Brittany Trogen, Torah Kachur, and Rheanna Sand

Abstract

Communicating scientific research to the general public is a potentially daunting task. Traditional and web-based media are awash in inaccurate, inconclusive, and contradictory reports. Science in Seconds is a website that provides evidence-based, scientifically accurate material in short, digestible videos and blogs. The material is a blend of science and humour, conveying complex science in plain language, and using analogies that relate it to day-to-day life. Ever mindful of maintaining scientific accuracy, Science in Seconds has been approved by the NatureBlogs Network and maintains close ties with the University of Alberta. By combining hard science with entertaining and engaging media, Science in Seconds is overcoming barriers to communication between the producers and potential users of research.

Background

One of the biggest issues facing the scientific community is how to inform, educate, and inspire the public to integrate science into their lives, and to combat the inaccuracies that have become widespread in traditional and new media alike. From climate change to stem cell research to the vaccine – autism fallacy, inconclusive and contradictory information is ubiquitous on and off the Internet, causing 45% of surveyed Americans to report 'hardly any' trust in science coverage in the press (National Science Foundation, 2010).

For the healthcare community, the Internet has become a double-edged sword. It has never been easier for healthcare practitioners to communicate with the public directly to share research findings and opinions on scientific issues. But the Internet has been harnessed with equal force to propagate anti-science messages, many of which have had real-world effects. The general public is often not equipped to interpret the data available to them in order to distinguish good science from bad. Some also lack the time and resources to make informed decisions about their health and the world around them.

KT Initiative

Science in Seconds is a website designed to provide evidence-based, scientifically accurate material in short, digestible videos and blog posts. With two videos and three blog posts weekly, writers, hosts, and producers Rheanna Sand, Torah Kachur and Brit Trogen cover topics ranging from biology, chemistry, and physics to technology, health, and anthropology.

Our mission is to educate, entertain, and inform the public about research being done around the world, and the relevance it has to their daily lives. As also indicated by the name of the initiative, the material produced is designed for quick daily consumption, with most videos running no longer than two minutes, and blog posts usually falling around 350 words.

The style of the material produced is a blend of science and humour, often mixing complex scientific concepts with analogies that more directly relate to day-to-day life. This fills a unique niche, providing scientific material that is readily available and designed for public consumption, but created for the purposes of explaining the results of research and science news in an entertaining fashion.

The Medium is the Message



(Left to right) Brittany Trogen, Torah Kachur, Rheanna Sand

Audience

The target of Science in Seconds is a curious public—end-users who have a desire to learn the basics in a broad range of science topics and ask questions about the science so often discussed in the news and conventional media. Our topics range in scope, from appealing to a high school- to university-educated public, to some material geared in language and content toward mature viewers.

Ultimately, this initiative seeks to appeal to a general audience, not one already specialized with a science education. This presents a potential dilemma, as presenting information in an overly complex or technical fashion runs the risk of alienating this audience, while oversimplifying could seem condescending. In this sense, our initial objective of combining complex material with humour and brevity has proven essential. By presenting relevant scientific material in an engaging and entertaining fashion, we believe we have facilitated knowledge transfer with our audience, and overcome, to some extent, one of the major barriers that so often prevents open dialogue in other knowledge transfer initiatives.

Results

In order to reach our key audience, we have attempted to integrate Science in Seconds into the vast science blogosphere using several different strategies. One avenue for growth has been connecting with other blogs, science promotion sites, and blogging networks. In May of 2010, Science in Seconds was approved as a member of the NatureBlogs network, as well as linked to the Research Blogging network and to Scientific Blogging, all of which have driven viewer traffic back to the site. We have also developed links with Women in Science, Engineering and Technology, and the University of Alberta Faculty of Science public outreach programs in an effort to reach out to interested members of the public.

Short and Sweet: Humour in Science Communication

Marketing through social media networks such as Twitter and Facebook have also been effective in reaching new viewers; in the past six months, links to the site shared via Facebook and other social media sites totaled around 20% of our viewers.

To engage with our audience, we've focused on developing interactivity throughout the site. With interactive comment sections and easily accessible links to a Facebook group, Twitter account, and e-mail subscription list, our audience can choose the level of immersion they wish to have with the material. By engaging in debates with other users and site administrators, or by following the many embedded links provided throughout the site, our audience can dig deeper into the material and clarify points that may have been left unanswered.

Evaluation

The success of the Science in Seconds initiative is being evaluated primarily in terms of audience growth, a measure that is tracked in the form of page views and visitors. All of our data is obtained from Google analytics software, and evaluation is ongoing.

Since launching in March of 2010, the site has seen moderate success in audience growth, with an approximate increase of 42% in visitors per week from April to September of 2010. We have also seen a steady increase in followers on social media sites, with a 31% increase in Facebook followers between April and September of 2010. Nevertheless, reaching a wider audience base remains a barrier to this initiative, and our future efforts are focused on strategies that will enable further growth through distribution on larger platforms and more established sites.

Discussion

Blending humour with science communication is a strategy that has yet to be explored in depth by any major media outlet. Historically, science has often been portrayed in a straightforward, to-the-point manner, and while this has the advantage of accurately depicting facts and information, it also has the disadvantage of potentially alienating those who already view science as the sole domain of specialists (Christidou, 2010).

One of the advantages of blogs over more traditional forms of media is that rather than simply disseminating facts and information in a passive way, blogs enable interactivity with their audience (Kouper, 2010). This allows the public to become involved in discussions about science and health, rather than being left on the outside.

Both humour and interactivity are aspects of knowledge transfer that we are striving to promote through Science in Seconds. In addition to maintaining an active dialogue through comments and social networking, we are also in the midst creating a wider guest blogging network. We believe that strengthening this audience interactivity allows for more successful knowledge transfer, as well as a more satisfying experience for audience members. Future initiatives might also benefit from attempting to integrate these aspects of science communication into their strategies.

One challenge we have faced in this initiative, however, has been striking the balance between accuracy and aesthetic appeal. While the main purpose of the website is to provide accurate information, it must also cope with the short attention span of Internet viewers, and their tendency to tune out overtly educational sources of information. Blending humour with otherwise straightforward information poses an additional challenge, as it raises the risk of lessening the accuracy of a given segment for the sake of comedic appeal, or even of causing offense in some cases. These are challenges we must work to avoid as we fine-tune this initiative.

The Medium is the Message

By presenting the results of current research and science news using plain language and across Internet-based media, Science in Seconds disseminates information to audiences who might otherwise never access the findings of scientific journals. We believe that by striking a fine balance between accuracy and entertainment, we are moving toward a unique status in the sphere of science communication.

About the Authors

Brittany Trogen, Torah Kachur and Rheanna Sand founded the website Science in Seconds in 2009. All are alumni of the University of Alberta. Trogen completed a B.Sc. in Molecular Genetics in 2008, Dr. Kachur a Ph.D. in Molecular Genetics in 2008, and Sand will complete her PhD in Cell Biology and Physiology in 2011. Trogen has since written for Discover Magazine, On Spec Magazine, and the daily news show Rocketboom in New York. Dr. Kachur is an Instructor at Grant MacEwan University, has completed the Banff Science Communications course in 2005 and has written for GenomeBC and PrioNews. Sand has appeared on Access TV, written for SEED Magazine and contributed to The Naked Scientists website.

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The Use of Digital Storytelling to Support a Quality Health System

Nadine Gall, Michelle Spencer, Todd Wolansky, Mark Moland, and Cathie Scott

Abstract

Evidence demonstrates that long-term outcomes for children and families with childhood developmental delays are significantly improved with early screening and intervention. However, developmental screening has not been systematically available for children throughout Alberta. When it is offered, it typically takes place at school age when learning and communication difficulties may already be established. The Knowledge Management Department of Alberta Health Services is exploring digital storytelling as a method for recording and transmitting the experiential knowledge of parents and healthcare providers with early intervention programming for children. The authors conclude that digital storytelling is an important source of qualitative data that enriches research and evaluation; that participating in the digital storytelling process encourages and rewards engagement in early childhood initiatives; and that digital storytelling is a powerful tool for knowledge transfer between parents, practitioners, and policy makers.

Background

Early intervention is good for kids when it comes to identifying and positively addressing developmental delays. We know that when developmental delays are identified at an early age, children and families have better outcomes.¹ With early screening and follow-up services, long-term negative impacts are reduced. Children build the foundations to enhance their readiness to learn and, consequently, optimize their potential.^{1,2} Yet, most screening does not occur until school age, when learning and communication difficulties are already established. The need for practice change is clear, and is supported by quality evidence.^{1,2}

“If you can catch problems early, you can do something.”

~ Parent participant

The Grow Along With Me project was one of four provincial pilot initiatives. It was funded by Alberta Health and Wellness, and was established to help families provide the best possible start for their children.³ Knowledge and resources from across the province were used to teach, support, and encourage family involvement in child development. Early developmental screening programs were introduced for children between the ages of 12 and 36 months, with subsequent follow-up services and parenting classes.

The pilot projects have now come to an end and there is need to leverage the learning from these projects in order to advance policy and leading practice in this area. As part of a dynamic approach to knowledge transfer, there was interest in incorporating narrative as a way to:

- engage clients and care providers in the change process
- provide a springboard for dialogue and subsequent change
- capture tacit knowledge to complement existing research and evaluation data

KT Initiative

The Purpose of this KT initiative is to study the targeted use of narrative and storytelling techniques in practice settings as a strategy to facilitate knowledge transfer and evidence-informed practice change.

Narrative is an effective method to improve the quality of health service delivery.^{4,5} Using narrative in health care settings creates an opportunity for the voices of patients and healthcare providers to be heard. Additionally, it adds context to the objective data that is stored in reports, academic papers, and evaluations. Providing this context helps to facilitate dialogue between patients, clients and decision makers. It is a powerful lever for change and improvement.^{6,7}



As health organizations move along their 'improvement journey' there is a growing need to leverage the knowledge and experience of those in the system. The breadth and depth of this knowledge, if shared, can create transformative health care. Sharing personal stories within the health system helps to break down the misconceptions, perceptions, and confusion that can impede the interpretation and use of this knowledge.^{6,7} Consequently, Alberta Health Services' Knowledge Management department is exploring the use of narrative and storytelling as a method of knowledge transfer.

"Knowledge that is passed on, or shared, is not lost but multiplied."

~ Charles MacKay

KT Strategy

In this particular KT initiative, digital storytelling was used as the narrative approach to capture parent and staff experiences with early intervention programming for children. Parents and staff were brought together and, through a facilitated group process, each created a digital story based on their experience: experiences of staff working with parents to develop their skills and in turn seeing them build confidence and gain knowledge to help their kids; experiences of parents struggling to find help for their child and then finding support and services in these programs; stories of children who were exhibiting frustration and starting to act out, receiving services and learning to communicate and feeling proud.

Digital stories are told by real people about their real experiences. The process draws on well-established traditions of education, oral history, visual arts, community photography, and grassroots social action. Digital stories are short, first-person video-narrative, created by combining recorded voice, still and moving images, and music or other sounds.⁶ The 'digital' aspect allows users to take advantage of emerging technologies, low-cost video production techniques, and a greater array of dissemination options.⁸ Digital Storytelling is user-driven. The facilitated sessions are developed to encourage dialogue and reflection, and to emphasize the lived experiences of individuals.

"It's about sharing experiences so others can learn from them, and then using that learning to improve the organization."

~ Sumner

Digital storytelling involves both the process of collecting, and of sharing stories. In this way three outcomes are achieved. First, by capturing patient and staff stories, their tacit knowledge is transformed into explicit knowledge. At the end of the digital storytelling process several artifacts of explicit knowledge have been created. Second, the actual process of collecting and creating personalized digital stories provides the storytellers with a sense of accomplishment and feeling of being heard. This improves their engagement and interest in quality improvement initiatives. Finally, the completed stories act to provide context and a common platform for conversations between decision makers, staff, and patients to discuss implementation of these quality improvement initiatives. Ultimately, they become a powerful tool to facilitate knowledge transfer and supplement existing evaluation reports or research papers.

"Behaviour change happens in highly successful situations mostly by speaking to people's feelings."

~ Kotter and Cohen

The Medium is the Message

Digital stories can be used by a variety of target audiences, depending on the intention. The accessibility of the stories allows them to be targeted to patients, staff, and decision makers. Digital Stories through a variety of means and are often used internally by organizations for various purposes such as: ⁹

- *education and knowledge sharing*
 - *for patients, family members, healthcare providers, leaders, and policy makers*
 - *incorporating tacit knowledge into practice*
- *illuminating research and evaluation findings*
 - *sharing emerging evidence and highlighting important gaps*
 - *sharing good news and good practice*
- *informing system change and management*
 - *sustaining change and implementation of best practices*
 - *identifying motivators for change*
- *developing leadership and organizational strength*
- *staff engagement and professional development, celebrating successes*

Results

By giving families and staff an opportunity to share their experiences, the digital stories provided an important source of qualitative evidence. This has added meaningful information and context to existing research & evaluation. The digital stories contributed to:

- understanding client and staff experiences
- learning from promising practices and evaluation
- promoting dialogue and knowledge sharing
- overcoming resistance to change
- improving client and staff engagement

Additionally, the stories are being used as a catalyst for discussion at local meetings and provincial forums with clinical and policy leaders in childhood development. The focus is on sustaining and spreading the practice improvements realized through these projects. Stories can be used to focus on particular interventions, while also reflecting on the array of contextual factors that influence their outcomes.⁸ Storytelling empowers practitioners and clients to share their knowledge so that services and decisions more accurately reflect their experiences and needs.

Key Messages

- Digital storytelling is a promising method for engaging clients and staff in service improvement.
- Digital storytelling helps facilitate dialogue and knowledge transfer.
- Storytelling provides a unique means by which to capture and convey client, staff, and organizational knowledge.

About the Authors

Nadine Gall has a background in community-based research with an interest in exploring innovative approaches to sharing and using knowledge to improve healthcare. Nadine currently holds a position in the Knowledge Management Department, Alberta Health Services. Michelle Spencer comes from a media and communications background and holds dual positions with the University of Calgary, Faculty of Social Work and Alberta Health Services, developing programming in digital storytelling and narrative. Todd Wolansky is a practitioner and researcher with a wealth of experience working with teams to implement evidence in practice. Todd is with the Knowledge Management Department, AHS, bringing expertise in communication and implementation strategies. Mark Moland has played a key role in developing and managing the 'Grow Along With Me' program and brings tremendous content expertise in early child development. Moland currently holds a position with AHS as a knowledge management consultant. Cathie Scott is executive director of the Knowledge Management Department, AHS. Scott has an applied research background with expertise in network theory, health system reform, and knowledge transfer.

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Improving the Diagnosis and Treatment of Osteoporosis Post-Fragility Fracture

Angela G Juby, Patricia Bayne, Shaunne Letourneau, Nese Yuksel, and David Hanley

Abstract

Although osteoporotic fractures cause morbidity and mortality, studies have shown a significant gap between what physicians know about osteoporosis and what they do in practice. Previous attempts to close the knowledge – action gap have failed to make any significant difference in clinical practice. This innovative fracture intervention project utilized existing health system infrastructure (Healthlink) to communicate with post-fragility fracture patients to enable them to be proactive in seeking appropriate osteoporotic diagnosis and care. Compared with published historical data from the Edmonton population, this intervention has resulted in a substantial increase in diagnosis and treatment rates, as well as fewer reported new fractures in this group.

Background

Osteoporotic fractures cause morbidity and mortality. Nonetheless, osteoporosis remains under-diagnosed and under-treated. Presently, fewer than 30% of patients receive osteoporosis assessment post-fracture and <15% receive treatment. This is a worldwide problem, but data from Edmonton have shown the significant under-treatment of hip fracture patients both in 2002 and no better in 2009.^{1,2} Despite the fact that 30% to 77% of fractures can be prevented with treatment, only 50% to 38% of Canadian patients receive appropriate follow-up and treatment for osteoporosis after a fracture. Follow-up after hip fracture is particularly poor (5% to 15%).³

One representative study found that within a year post-fracture, 71% of patients had received no advice about osteoporosis from their family physician and only 12% were offered therapeutic intervention. These results are borne out by studies in Alberta.^{4,5,6}

Studies have shown there is a significant gap between what physicians know about osteoporosis and what they do in practice. The knowledge level is high. Many solutions have been sought to address this gap, but none have been shown to make any significant difference to real clinical practice.

This study therefore, has chosen to take the onus away from the hospital and family physician team and to work directly with the patient to enable them to be pro-active in initiating the appropriate post-fracture care with their healthcare providers.

KT Objective

This project was undertaken to attempt to address this diagnostic and management care gap. Effectiveness of the pilot was measured by the proportion of patients who followed up with their family physicians, the number of patients who had a bone mineral density (BMD) test and the number of patients diagnosed with osteoporosis who initiated appropriate therapy.

Methodology

Health Link Alberta is a toll-free, 24-hour-a-day, seven-days-per-week telehealth service that provides health advice and information through registered nurses. Criteria for selection of patients for screening for osteoporosis and inclusion in the project were: >50 but <85 years of age; phone number present; address is not a long term care facility; first visit for this diagnosis; and who presented in emergency department or cast clinic with one of a defined group of ICD 10 codes (to capture potential fragility fractures). Once identified, candidates were phoned by a nurse to determine whether the fracture might be attributable to osteoporosis. If so, the patient received immediate education and advice and the patient's physician received a letter and treatment algorithm. Patients were called again at three, six and 12 months to ensure recommended assessment had occurred. Health Link nurses could also refer patients to the specialty osteoporosis program at the Grey Nuns Hospital in Edmonton or the 1-800 Help Line of Osteoporosis Canada for detailed information support. Ethical approval from the University of Alberta was obtained to enable evaluation of



Health Link Call Centre

Audience and KT Strategy

The end-user in this study is the patient, and via them, to inform and educate their healthcare provider. Patients with osteoporosis vary considerably in their knowledge of the disease.⁷ In fact many of them do not know that they have osteoporosis and this is one of the main objects of this project. Knowledge of their diagnosis empowers them to be proactive about managing their disease.

Sustaining the Intervention

The pilot project was funded through the Government of Alberta. The success of the pilot project resulted in a plan for the project to continue as the new standard of care in Edmonton, and for a similar process to occur in Calgary once their Health Link was established. Unfortunately, changes within Alberta Health Services have resulted in the funding being cut and the implementation of this initiative being cancelled.

Evaluation

Outcomes were determined following patient telephone surveys at three, six and 12 months. The 12-month data are reported here. There were 515 patient contacts, and 322 questionnaire results. (49 declined, 39 moved, 12 were admitted to LTC, 6 died, 87 lost to follow-up). Average age was 72 years (254 women and 68 men). In the last year: 82% had seen their doctor about their bones; 52% had received a diagnosis of osteoporosis; 81% had had a BMD test (50% men, 89% women). 37% were on bisphosphonate therapy; 49% were not taking any anti-resorptive medications; 83.5% were taking calcium and Vitamin D supplements; 5.6% had had another documented fracture.

Results

Follow-up with Physician

The intervention was highly effective at encouraging patients to see their physician to discuss osteoporosis. The majority of patients—79.3% of the high-risk group—had followed up with their physician by three months after the Health Link screening intervention. An additional 6.5% followed up with their physician after their three-month reminder call from a Health Link nurse. By six months, 85.9% of patients who received follow-up had visited their doctor and, in stark contrast to other studies, men were as likely as women to have followed up.

Bone Mineral Density Testing

By the end of the pilot project, an impressive 73.3% of those who had visited their physician had received a BMD test. Female patients were more likely than male patients to be asked to have a BMD by a significant margin of 13%, suggesting that physicians may still under-appreciate the significance of fragility fracture as an indicator of osteoporosis in men. That said, the results were still superior to those reported in other studies; in a recent study by Hawker et al (2002), only 20% of patients at an urban fracture clinic in Ontario had undergone investigation and/or received treatment for osteoporosis at one year post-fracture. A study in Edmonton found that only 17% of control patients (i.e., those not receiving an improved care strategy as part of a research study) had had a BMD, while 62% of those who had received a brief patient counseling interview with a nurse, accompanied by a letter to the physicians had done so.⁴ The 73.3% achieved in the current pilot project is clearly unprecedented and outstanding.

Diagnosis and Treatment

Of patients who had had a BMD and received a diagnosis of osteoporosis from their physicians, 72.5% were put on an osteoporosis medication. This compares very favourably to treatment rates in patients who receive diagnoses for other conditions. However, what is unclear is whether physicians missed diagnoses in patients who should have been treated by virtue of having had a fragility fracture, and who did not go on to have a BMD test. Only 5.6% reported another fracture at the one year follow-up.

Key Messages

This simple intervention used an existing telephone help line as a case-finding and intervention tool in the setting of fractures. Based on published historical data (from the Edmonton population) this intervention resulted in a substantial increase in the diagnosis, investigation, and treatment rates, as well as fewer reported new fractures in this group.

This is a cost effective, readily transferrable project that can be initiated in other centres with an existing telephone help line.

Targeted patient education programs may address some continuous gaps in knowledge and behaviour: only 60% of the patients were engaged in aerobic activity regularly; 20% had not been to see their doctor in the year since their fracture; only half had been told that they had a diagnosis of osteoporosis in spite of 82% having had a BMD test; and men had a significantly lower use of Vitamin D and calcium supplementation.

Long term continuance of this project should be considered as standard of care for all Albertans post-fracture, particularly given the aging population and the likely increase in fracture rates.

About the Authors

Dr. Angela G Juby is an associate professor of Medicine in the Division of Geriatrics at the University of Alberta. She is also currently the president of the Canadian Geriatrics Society. Dr. Patricia Bayne works in Policy and Government Affairs with Eli Lilly Canada. Shaunne Letourneau is the director of Health Link Alberta with Alberta Health Services. Dr. Nese Yuksel is an associate professor of Pharmacy at the University of Alberta. Dr. David Hanley is a professor of Medicine at the University of Calgary.

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Schizophrenia Reconsidered: Personal Narratives as a KT Strategy

Austin Mardon and Justin Selner

Abstract

Austin Mardon is an alumnus of the NASA Antarctic Meteor Recovery Expedition (1986) and the recipient of many prestigious awards, including the Alberta Centennial Medal (2005). In 1992 Mardon was diagnosed with schizophrenia and has since become a tireless advocate for reducing societal discrimination and stigmatization towards persons suffering from mental illness. In this article, Mardon shares his insights and opinions about using personal narratives to create empathy and understanding toward mental illness.

Background

Although “schizophrenia has been recognized for more than 100 years as a form of severe mental illness” the holistic and emotional well-being of schizophrenic individuals still remains a trivial societal concern.¹ Consequently, this perpetuates a destructive cycle that has reverberated and even worsened throughout generations of mentally ill individuals. The most debilitating and pervasive response to schizophrenic people is discrimination.⁴ This has taken form in a variety of bureaucratic policies and preconditioned (although perhaps unintentional) societal reactions. It is nearly impossible for these individuals to receive any private health insurance and life insurance, or private disability insurance. As a result, many of these individuals are forced to live well below the poverty line in conditions which often stimulate and exacerbate their psychotic tendencies.

A significant discordance is also prevalent between the general knowledge of society and the impoverished culture of the mentally ill. Oftentimes, when a patient seeks help through the community they are greeted with societal disapproval. For instance, Austin Mardon used to rely on the support of the food bank to ensure he had enough food. While the proactive approach to seeking out and taking help is a monumental improvement for schizophrenic individuals, there is still a lingering societal belief which posits that the use of assistance, whether communal or otherwise, constitutes a negative reflection on one's character. In reality, it is likely says Mardon that the supporters of this opinion possess an extremely limited understanding toward living poor. The more plausible alternative embodies the notion of societal fear towards the “others” or those who are different. Concerning this particular situation, there is an established fear of the poor and mentally ill. That is, if you are poor you are more likely somehow a bad person. A lack of knowledge and understanding may also account for force being used by law enforcement to subdue a mentally ill individual.⁶ The work described here suggests that a conscious endeavour to instill lasting knowledge throughout society may eventually eliminate discrimination toward the mentally ill.

KT Strategy

Mardon believes that a significant factor contributing to the presence of discrimination towards the mentally ill comes from the inability of society to relate to and empathize with these individuals. Although efforts have been taken to disseminate information regarding schizophrenia and mental health, the intended effects have not manifested. Rather than instilling a sense of compassion and proliferating a widespread understanding towards the mentally ill, the purely factual information has produced insignificant changes in popular behaviour. Noam Chomsky's reasoning offers insight into the ineffectiveness of the statistical mental health data when he states, "You can't just assume that because something's there it is functional, or has been adapted forIt could be just there".² In an attempt to engage key audiences and create lasting change, Mardon, in conjunction with the Schizophrenic Society of Alberta, began giving public speeches in 1993 concerning schizophrenia. Immediately following the presentations, information cards were passed throughout the audience so listeners could report their reactions. The information in Mardon's presentations was not impersonal statistical information on mental illness but rather included a personal example. Using personal stories to humanize situations from clinical events and mechanistic facts can establish a deeper connection with the audience and invoke feelings of empathy towards the mentally ill and schizophrenic population. Psychologist Katherine Nelson (1985) supports this assertion in her findings that, "Individual speakers may use words in such a way as to convey different meanings on different occasions of use, depending upon intentions and discourse context".⁵ Thus, Mardon carefully and specifically relates his experiences so as to invoke a significant emotional response. As the talks and presentations began to generate positive feedback, additional media were used to further growing interest.

Impact

Mardon says that significant success has arisen from speeches that tied clinical information to an emotional and personal experience. In many situations, the context had such striking emotional presence that some audience members began to cry. This method of conveying information produces not only societal empathy toward schizophrenics but also seems to create an enduring attachment toward the information presented. The audience surveys administered after the speeches indicate both a reduction in stigma and an increase in knowledge concerning mental health. As a result, Mardon says he has perceived a strong decline in societal discrimination. A few years after one event, an individual who had been present in the audience had unfortunately developed schizophrenia. She said that the empathy generated during the speech significantly influenced her to seek treatment. Rather than retreating into a delusional reality, this individual accepted her situation and embraced the positive possibilities that arise from proper treatment. The use of personal narrative has also supported a positive relationship with the popular media. Mardon is able to publish in daily newspapers with relative ease. Furthermore, he reports a genuine willingness in the media to listen to what he has to say.

Key Messages

The lessons learned from this KT initiative have been truly integral to initiating a reduction in societal discrimination towards schizophrenic and mentally ill patients. The following highlights this newly acquired knowledge:

1. The ability to humanize and relate impersonal medical data facilitates a profound societal reaction in that individuals develop a strong sense of understanding and compassion towards the mentally ill.

The Medium is the Message

2. Once this emotional bond towards the personalized experience has been established, societal discrimination appears to dissolve and is replaced by an increasing awareness about the lives of psychotic individuals. This connection may also prompt psychotic individuals to seek treatment.
3. In order for this information to reverberate throughout society and have the possibility to invoke widespread change, it greatly relies on the openness, willingness, and support of the media.
4. It will require a continual and constant effort from everyone to ensure that information continues to be dispersed so that societal attitudes will continue to evolve into being accepting and understanding of mentally ill individuals.

Next Steps

Although there is strong documented evidence highlighting the success of personal narratives to convey information, continual efforts must be made to maintain or further these achievements. If more than the current 10% of psychotic individuals who take their medications were to take medication, the outcome for the mentally ill would dramatically improve.⁴ As well, the costs to society would decrease as the pressure on the mental health system would likely be lessened and the large population of homelessness would hopefully decrease. All of this is both possible and attainable, and the steps toward attaining these goals have already begun to be taken. However, it is essential to remember that change can happen, but individuals, government, and society at large must be willing to embrace change and eliminate their fear toward the schizophrenic and mentally ill.

About the Authors

Austin Mardon has four decorations including the Congressional Antarctic Service Medal, the Alberta Centennial Medal, and the prestigious Order of Canada (member). He has authored several books and over 200 peer-reviewed communications. Just recently, on September 24, 2010, he received the Alberta Medical Association's highest award for a non-physician: the Medal of Honour. Justin Selner is a political science student at the University of Alberta. He is also a dedicated varsity swimmer and is involved in many humanitarian efforts.

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Research to Action: A CADTH Liaison Success

Ann Vosilla, Gabrielle Zimmermann, Donna Champagne,
and Brendalynn Ens

Abstract

Production of high-quality evidence and well-documented reviews are of no benefit to Canada's health providers until the knowledge has been sufficiently shared to be useful and actionable. The Canadian Agency for Drugs and Technologies in Health noted that evidence-informed decision-making requires a transfer of knowledge to the user in a way that is appropriate to differing contexts. In order to meet the unique diversity in each western province, liaison officers have strategized individual frameworks for knowledge dissemination and exchange. The authors conclude that the role of a liaison officer (or knowledge broker) is imperative to build relationships for local engagement so that KT activities can be customized to each stakeholder audience for maximum impact.

Background

Production of high-quality evidence and well-documented reviews of evidence are of no benefit to Canada's health providers unless the knowledge has been sufficiently shared to be meaningful and actionable. Providing timely, relevant, and rigorously derived evidence-based information to decision-makers to support the decision-making process has been the mission of the Canadian Agency for Drugs and Technologies in Health (CADTH) since 1989. Meant to facilitate the appropriate and effective utilization of health technologies within the healthcare system across Canada, CADTH noted that evidence-informed decision making and decision-maker informed health research requires knowledge transfer to the user in a way that is appropriate to differing contexts. A liaison team was implemented and officers provide local and strategic contextual support to address health technology questions, and to mobilize and action knowledge. Liaison officers currently provide innovative knowledge exchange and uptake activities in every participating Canadian jurisdiction.



KT Initiative

Researchers produce evidence to support informed decision-making, but what good is evidence if it sits on the bookshelf? The challenge of evidence mobilization has always been the cornerstone of spanning evidence to practice. Liaison officers possess a wide variety of knowledge translation and support skills to raise awareness by actively engaging healthcare professionals within jurisdictions, speaking at conferences, hosting exhibits and workshops, and linking stakeholders. Bringing like groups together to discuss knowledge transfer issues, and to dialogue on evidence and practice are some of the many activities of the liaison officer.



Researchers and knowledge producers need to consider how to ensure their product is available to the user in understandable and implementable ways. Liaison officers facilitate knowledge sharing suitable to stakeholder needs. In western Canada, the liaison officers carry out this work in the ways that are most jurisdictionally suitable. The ways in which evidence informs health service providers differs across Canada. This article will narrate examples of processes, structures, and knowledge brokering that have demonstrated an impact on evidence-based decisions and decision maker informed research within western jurisdictions. These jurisdictional specific interventions are discussed at the macro, meso and micro levels of knowledge mobilization.

When thinking of challenging and changing systems, it's not uncommon to think of Alberta's province-wide, fully integrated health system implementation in 2008. Twelve separate health entities were brought together which included nine health authorities, the Alberta Alcohol and Drug Abuse Commission, the Alberta Mental Health Board and the Alberta Cancer Board. With continuously evolving changes, how do liaison officers optimally mesh with these systems to support evidence-informed practice? The answer lies in multi-faceted, strategic, and jurisdiction-specific approaches to service delivery.

KT Strategy: Macro Level

Early in CADTH's introduction in Manitoba, interventions at the ground level were needed to engage interest in health evidence application. But it was equally acknowledged that there was little to no awareness of CADTH and (then CCOHTA). The board representative introduced the liaison officer to all regional health authorities and to the folks representing those health authorities with a distributed letter that included a high level description of CADTH and its mandate to inform health technology or intervention decisions. In order to access all levels of decision makers, the liaison officer needed to be well known by CEOs of the health authorities and have permission to take time with their staff.

1. Letters were followed by a phone call to regional CEOs to provide info and to reach the best people for CADTH services. CEOs responded with introductions and linkages that have spiraled and expanded over several years. Throughout this process the liaison officer, as knowledge broker, ensured relevant and timely examples were provided to engage multiple levels of jurisdictional stakeholders.
2. Connections are crucial between numerous provincial networks and related working groups that provide health technology services and direct policy throughout the province are crucial. For example, in Manitoba (as in other provinces) the liaison officer is a non-voting member on many jurisdictional committees such as medical imaging and purchasing committees. In this role, the liaison officer supports knowledge and assessment needs for future purchase decisions. Being involved at these levels puts CADTH in a readiness position to provide and share relevant and timely information.
3. Current linkages with all professional levels of health service providers become increasingly important as we move further into influencing and informing health decisions.

Building Partnerships, Building Capacity

In addition to staying connected with health service providers, it's important to stay linked with the health ministry and other health technology assessment agencies in the province. The Alberta liaison officer achieves this by participating as a non-voting member of the Alberta Advisory Committee on Health Technologies, staying connected with the various HTA agencies within Alberta, and being accessible to health ministry staff.

As the sands were shifting in Alberta's changing healthscape, it was imperative for the Alberta liaison officer to keep abreast of numerous changes, connecting with new contacts while not losing previous linkages. Once the new CEO was appointed, it was essential to meet and identify where CADTH could best provide support and assistance. This led to several meetings with vice presidents and executive directors which, in turn, connect the liaison officer with new programs and processes and the people who drive them.

An example of a critical linkage developed in Alberta and maintained through all the changes is with the Local HTA Decision Support Program, developed by the Department of Surgery and Surgical Services of the former Calgary Health Region. CADTH has been instrumental in decision support by providing timely relevant reviews of evidence regarding any health technology under evaluation by the Local HTA Decision Support Program. These integrated relationships reduce duplication of effort and stimulate partnerships.

KT Strategy: Meso Level

Successful evidence mobilization requires provision of the right information to the right people at the right time. Connecting with key stakeholders in BC was paramount to a successful journey. Once all CEO-level introductions were completed, it was time to delve deeper into the health system. Existing uniqueness between and within health authorities enforced a tailored approach that included working with each of the health authority members within their existing structure, meeting local needs. Engaging executive directors and medical directors was part of the existing structure within one health authority while others meant engaging program specific leads. Uptake of evidence was not immediate, sometimes requiring several repeat visits. A "group therapy" approach led to open discussion. Like groups were not communicating, so a role for the liaison officer evolved in bringing these groups together. When differing groups working on like projects were identified, attempts were made to join leads and reduce the duplication that occurs with silo-type work projects. This has led to work sharing, exchange of ideas, and new collaboratives.

BC is challenged by large geography and similarly substantial health authority sizes. One liaison officer for the province meant starting small with one health authority to focus efforts and obtain momentum. Dissemination of evidence via the extranet and key stakeholder meetings with vice presidents and CEO's provided a top-down approach. Point persons were identified at both the health authority and Ministry of Health Services level, so each health authority had a "go to" person for knowledge exchange (CADTH RHA Liaisons). This provides for consistency in knowledge dissemination to department levels or directors of programs as suitable to the health authority structure. Success is measured in induction of evidence both into policy as well as into practice.

KT Strategy: Micro Level

The concept of being "evidence-informed" has evolved significantly in recent years for governments, senior leadership teams, bedside clinicians, and facility-focused program managers. Micro-level healthcare providers frequently seek evidence to improve services and treatment options offered to clients and families.

In Saskatchewan, strong linkages between the liaison officer and a wide range of clinically-focused and program management groups in all health services, ranging from critical care to public health for all multidisciplinary groups, have developed steadily over time. Building on established relationships,

the liaison officer navigates specific research needs as they relate directly to patient care issues and information support acquisition. CADTH support has been provided for hospital formulary decisions which have led to story sharing among clinicians. Clinical relationships have been advanced through liaison officer attendance at committee meetings, education days, student training classes, horizon scanning new technologies, and regular clinician updates on CADTH projects and reports. Clinical conferences geared to multidisciplinary interests have been excellent forums to promote shared decision-making, information sharing, and collaboration among healthcare groups. CADTH is seen as a primary source for credible information that impacts clinical policy, protocols, and practice decisions.

As in BC, the liaison officer role in Saskatchewan has led to some dissolution of local silos and regional ownership of policies and protocols. As an active participant on many facility-based committees and provincial decision tables, information requested by one group is rapidly shared with interested clinicians. CADTH rapid reviews are presented by the liaison officer as a means of providing unbiased results to committees surrounding controversial issues, to promote open facilitated discussions.

Liaison officer support to individual pharmacy and primary health clinicians has engaged urban, rural, and remote clients in self care by providing best practice recommendations that impact both clinical and economic factors (routine distribution of self-monitoring of blood glucose testing for Type 2 Diabetes patient materials at two Saskatoon-based community clinics). Materials and evaluation support is collaboratively shared by clinicians and the liaison officer.

Key Messages

Many clinicians and decision-makers in health are aware that unbiased evidence is essential to informed practice, but may not have the skills to determine quality and bias in research. LOs have been instrumental in supporting such educational needs at all levels of the health system. Basic and advanced workshops support skill development in critical areas. Reviewing reports with health decision-makers has provided the evidence to action link that is often needed. The key success factor for knowledge dissemination has been in meeting the needs of the stakeholders through tailored strategies that produce results.

About the Authors

CADTH liaison officers in western Canada work with stakeholders: BC Ann Vosilla R.N., ASCFS (Honours); AB – Dr. Gabrielle Zimmermann, Ph.D.; SK – Brendalynn Ens, R.N., M.N., C.C.N.(c); and MB – Donna Champagne, R.N., B.N., M.P.A. Assisting with access to and use of evidence-based health technology information, contributing to enhanced communications between CADTH and the jurisdictions, they highlight local needs, issues, and priorities that can guide program development, and service delivery, and improvement to ensure evidence and services remain responsive and relevant.

As liaison officers, Vosilla, Zimmermann, Ens, and Champagne encourage the use of evidence-based information in making decisions about health technologies, gather information on local health technology issues and priorities, identify potential topics for assessment, information, and educational needs and convey information on processes and timelines related to health technology decisions.

The Western Canadian Interprofessional Health Collaborative

Zahra Nurani, Liz Harrison, Jana Lait, Grace Mickelson, Sandra Jarvis-Selinger, and Esther Suter

Abstract

In 2007 healthcare practitioners, educators, researchers, and policy-makers came together for a conference on interprofessional practice and education. At this conference a group of participants from the four western provinces decided to explore a regional approach to how interprofessional practice can lead to better outcomes for patients, providers, and systems. An obvious barrier was the geographical distance. However, what began as a network of 10 people communicating by email and telephone evolved into an electronic community of practice (eCoP) engaging 90 professionals across western Canada via a dynamic website and web conferencing. An eCoP can be valuable for sharing ideas, networking, and accessing information to accelerate knowledge translation but requires a common area of interest, time, and opportunity to strengthen relationships and a dedicated facilitator.

Background

We are a group of people from healthcare education, practice, and research in Manitoba, Saskatchewan, Alberta, and British Columbia who are interested in interprofessional (IP) education and practice. We would like to share with you some knowledge translation strategies we used to engage stakeholders we wanted to partner with.

Members of our group first met through our involvement in research projects funded in 2006 by a Health Canada initiative called Interprofessional Education for Collaborative Patient-Centred Practice (IECPCP). In 2007, we brought together healthcare professionals, educators, researchers, and policy-makers for a conference to share views on the outcomes of the IECPCP projects. Some participants at this conference decided to create new linkages by bringing together stakeholders from the four western provinces to learn more about how IP practice and education links to health human resource planning and management. So in 2008, some of the attendees from this conference, and others we invited from practice, education and policy sectors, formally established ourselves as the Western Canadian Interprofessional Health Collaborative (WCIHC).

KT Initiative

The initial group of about ten people has developed into a community of practice (CoP) around IP practice and education and health human resources. A CoP is a network of people having common interests who interact regularly to learn and create knowledge together (Wenger;¹ Ho²). CoPs facilitate the sharing and application of knowledge over a sustained period of time. The first project we undertook was a CIHR-funded knowledge synthesis to examine the impact of IP collaboration on health human resources. The process of completing this knowledge synthesis allowed us to become closer as a core group and to connect with people in our networks about our progress on the project. As our members cover four provinces, we communicated by phone and email. This worked well for the small group but we soon realized we needed to engage the people that attended our early meetings and keep everyone excited about the topic. Our group was in a unique position to use knowledge and resources from the four western provinces to support the development of workforce strategies that are evidence-based and sustainable. The primary audience was



health human resources policy and decision-makers, researchers, and educators across the four western provinces. They were interested in our research because they knew that there was evidence on how collaborative practice leads to good outcomes for patients, providers, and systems, and wanted to know how to apply collaborative practice to resolve health human resources policy and decision-makers, researchers, issues in their own organizations. We used two major strategies to engage our target audience. The first strategy was Internet tools (website and electronic CoP) and the second strategy was a unique end-of-grant event.

KT Strategy

Online Tool

We decided on a website (wcihc.ca) because, like any dispersed group, we were challenged to find an easy-to-use medium to connect with each other. With funding and technical support from the University of British Columbia's TEK TIC division (Technology Enabled Knowledge Translation Investigative Centre), we developed a website that enabled us to share information about our team and our interprovincial collaboration, as well as updates and documents on the knowledge synthesis project. Through this website, we created an electronic CoP (eCoP) to link our diverse stakeholders, facilitate online discussions, and alert community members about tools, resources, and events. Ho et al (2010) identified six principles of eCoPs. These are: 1) voluntary involvement; 2) problem-focused; 3) distributed leadership; 4) accessibility; 5) shared identity; and 6) sustainability. The eCoP helped us share documents and collaborate with each other in our core team during the knowledge synthesis. It also engaged our stakeholders throughout the knowledge synthesis and helped us identify partners for future work.

Analytics tools showed that from August 2008 to August 2009, the website had 942 visits by 169 visitors who viewed various pages 6,028 times and spent an average time of 3:37 minutes on the site. Of the 169 visitors, 90 became eCoP members (they requested a login). Fifteen eCoP members completed an evaluation survey about the website. Most respondents said they used it from a couple of times a month ($n=7$) to a couple of times a week ($n=5$). The top three ways of using the eCoP were 1) reviewing contents and resources; 2) reading discussion posts; and 3) downloading information. These responses were similarly reflected in the analytics data. Respondents described the top three benefits of the eCoP as: 1) sharing ideas and network building, 2) having information available, when it was needed in an easily accessible location; and 3) "speeding up" knowledge translation.

Respondents felt that having time to visit the eCoP was the biggest challenge. The other challenges included maintaining an up-to-date site including resources and discussions as well as continuing to build the network through partner engagement. The top three suggestions for improvement of the eCoP were: 1) to develop a better understanding of its potential and create strategies to engage new members, 2) to provide more support for users, including training; and 3) to make it more fundamental to how partners communicate with each other.

Building Partnerships, Building Capacity

Funding and technical support were critical for the creation of the website. The initial activities related largely to information exchange about the knowledge synthesis between core team members and for sharing of materials with our wider group. But the website went beyond that—it increased the team’s visibility and credibility and created a meeting place for people interested in IP education and practice and its impact on HHR.

Engaging partners in active online discussions remained a challenge. We, as core members, found it challenging to initiate and maintain discussions on the discussion board or to engage stakeholders in other ways. Members accessed the reports, presentations, and fact sheets but seemed to have little desire to participate in interactive exchanges. By the end of the knowledge synthesis project, the community had not yet developed the critical mass to initiate discussions. This highlights the importance of a strong facilitator in the development of an eCoP. In many ways, the full potential of the eCoP has not been realized but the website has created more visibility for the research project and the WCIHC, and facilitated some important relationships between researchers and partners that continue to grow.

End-of-Grant KT

We used an innovative delivery format for an end-of-grant session to discuss the findings of the knowledge synthesis. We connected more than 100 invited stakeholders through a web conference at five locations across the four western provinces. Supported by local facilitators, each group participated in the large group presentations and then discussed the local application of the findings and strategies for their province. All locations reconnected at the end of the day allowing us to exchange local plans and identify synergies across the four provinces. Linking people across four provinces enabled a critical mass of interprovincial participation and added momentum to the discussion. It also enabled a valuable mix between group discussions by web conference and local face-to-face sessions.

Participant evaluations of the event were positive, underscoring that this event achieved the goal of connecting a broad range of stakeholders across Canada while being cost effective. Respondents either agreed or strongly agreed that the event was a good use of their time and that their expectations of the event were met. The actions respondents listed include that they would take back information to their own organizations and create linkages across organizations around the topic of IP and HHR.

This dissemination event was greatly successful. We realized we can have events that bring people together across cities in a format that keeps travel expenses low and thus allows more partners to participate than if everyone meets at one location.



Key Messages

Our greatest KT challenge with our audience was engaging them in learning and dialogue, individually and collectively, over time and across multiple jurisdictions and settings. We were also challenged to 'pitch' the findings appropriately via various dissemination tools. The message should be relevant to the audiences' context (i.e., health policy, service delivery, education, or research at a regional, provincial, or organizational level) and in a language relevant to them.

Our greatest KT facilitator was leveraging our core group members' networks and contacts to reach partners. We strengthened relationships by linking people within a province for context-relevant discussion and established new relationships across western Canada. Another important facilitator was identifying a specific area of interest for our audience—we wanted a regional approach to IP education and practice, and bringing in the HHR component was engaging to decision makers and policy makers and filled a gap in their knowledge.

Information technologies are available to support collaboration and communication across regions. Ensuring the technology meets a need identified by the group and having a dedicated facilitator are critical for success.

We are hopeful about continuing to do research projects together as a core group, and about continuing to develop our KT strategies to move forward in linking IP practice and education to HHR strategies in western Canada.

About the Authors

We are an interdisciplinary team of researchers, educators, practitioners, information specialists, and decision-makers, with collective expertise to examine best practices in interprofessional collaboration in health care. Team members have strong links to provincial, regional, and national networks that facilitate knowledge translation across sectors and jurisdictions. Our journey began in 2006 through the Canadian Interprofessional Health Collaborative (www.cihc.ca) which recognized the potential to spread innovation via a regional approach. Our core team formed a community of practice called the Western Canadian Interprofessional Health Collaborative (www.wcihc.ca). Involvement of decision-makers from health and education sectors ensures that our research is relevant to policy.

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Mobilizing Knowledge as We G[r]o[w]

Sherry Ann Chapman, Kelly Shaw, and Tara Hanson

Abstract

Optimizing the development and well-being of children, youth, and families is a key goal in Canadian society. Members of the Mobilizing Knowledge About the Development of Children, Youth, and Families project studied, developed, and sought to enhance the capacity of campus and community groups to engage in collaborative, interdisciplinary, and sustainable relationships that support the development of children, youth, and families. This initiative consists of an evaluation of KM activities (symposia, workshops, etc.), as well as the development and implementation of new capacity building opportunities. The authors conclude that knowledge mobilization is a collaborative process among diverse stakeholder groups with multi-faceted perspectives. This process requires the development of strong relationships amid the identification of knowledge needs, the undertaking of community-based research and evaluation, and the ongoing movement of knowledge in support of children, youth, and families.

Introduction

Optimizing the development and well-being of children, youth, and families is a key goal in Canadian society. Attaining this goal is complicated by rapid changes in culture, economy, education, and social policy. Researchers, community agencies, and policy-makers are becoming increasingly concerned about mobilizing research-based knowledge for the purpose of improving programs and policies that influence the lives of children and families. In response, the Community-University Partnership for the Study of Children, Youth, and Families (CUP) and the Alberta Centre for Child, Family & Community Research (ACCFRC) partnered for the project, *Mobilizing Knowledge About the Development of Children, Youth, and Families: Focus on Knowledge Transformation and Learning (MKAD)* (2006–2010).¹ The purpose of the project was to study, develop, and enhance knowledge-mobilization (KM) initiatives that build capacity on campus and in community to engage in collaborative, interdisciplinary, and sustainable relationships that support the development of children, youth, and families.

MKAD consisted of two initiatives: (1) an evaluation of KM activities (e.g., symposia, workshops) that are frequently used to share research evidence for application purposes; and (2) the development and implementation of learning opportunities on campus and in the community to support leadership and participation in community-based research and evaluation. Community-based research and evaluation can be inherently oriented to KM because partners are creating, exchanging, and applying research information together. For this reason, MKAD members designed and implemented learning opportunities about community-based research and evaluation for people working in support of the development of children, youth, and families.

¹MKAD was supported by the Social Sciences and Humanities Research Council of Canada (Knowledge Impact in Society grant); the Alberta Centre for Child, Family & Community Research (ACCFRC); and the Faculties of Arts, Education, Nursing, Medicine & Dentistry, and Rehabilitation Medicine, along with the Office of the Vice President (Research) at the University of Alberta.

Background

In July 2000, the Community-University Partnership for the Study of Children, Youth, and Families (CUP) was formed to improve the development of children, youth, and families by promoting interactions among researchers and community members (e.g., practitioners, policy-makers, families) in the areas of research, knowledge sharing, and lifelong learning. CUP strives to fulfill its mandate by engaging in consulting and brokering, providing learning opportunities, and leading community-based research and evaluation projects.

The Alberta Centre for Child, Family & Community Research (ACCFRC) was created in April 2003 to improve the well-being of children, families, and communities in Alberta, Canada, and internationally, by mobilizing research evidence into policy and practice. By developing, funding, supporting, and integrating research across sectors and disciplines, ACCFRC provides an evidence-based foundation for identifying and promoting effective public policy and practice.

Stakeholders (i.e., researchers and community members) affiliated with CUP and ACCFRC have long perceived the potential of Knowledge Mobilization to influence policy, practice, and programs. In 2005, CUP and ACCFRC applied for the pilot Knowledge Impact in Society grant offered by the Social Sciences and Humanities Research Council (SSHRC). A needs assessment was also conducted at that time to determine local interest in developing capacity on campus and in community in the area of community-based research and evaluation, as it inherently involves Knowledge Mobilization. On this foundation, MKAD was launched.

KT Initiative & Objective

In this chapter, we focus on the first of MKAD's two initiatives: an evaluation of KM activities (e.g., symposia, workshops) that are frequently used to share research evidence for application to practice and policy. The objectives of this initiative were:

1. to study the KM process within our context
2. to identify how we can mobilize knowledge effectively

Through the initiative, we expected to build the capacity of CUP and ACCFRC to mobilize knowledge effectively and to contribute to the growing body of understanding about KM. The initiative was completed in March 2010. We are currently in the process of sharing the lessons we have learned with stakeholders and other groups.

Audience

The KM activities hosted by CUP and ACCFRC attracted participants who came from many walks of life (e.g., researchers, practitioners, policy makers, students, parents) and disciplines (e.g., health, education) across Alberta. They were mainly female, had a college or university education, and varied in their levels of experience or background knowledge about the content of the KM activities (e.g., early childhood development). Participants attended the KM activities for similar reasons (e.g., to inform their service provision, to increase knowledge about a topic, and to exchange information with others.)

Methodology

We began the initiative by contacting key researchers in the KM field and conducting a review of literature within various disciplines (e.g., health, social sciences). Over time, we learned that KM in our context means that: (1) we mobilize information specific to the well-being of children, youth, and families; (2) the information is diverse; it includes not only research information but also experiential and “how-to” information; and (3) we seek to reach an array of stakeholders (e.g., researchers, practitioners, policy-makers) from many disciplines (e.g., health, education). Accordingly, we decided to define KM in our context as the creation and movement (i.e., dissemination, exchange, use) of information (e.g., research, experiential, and “how-to” information) among stakeholder groups (e.g., researchers, practitioners, policymakers) in support of the development of children, youth, and families.

To study and evaluate our KM activities, we realized early on that we would need to develop a conceptual KM framework. We collated ideas from the work of others and modified them to fit our context.^{1,2,3} We used the KM framework to guide the evaluation of selected KM activities hosted by CUP and ACCFCR (e.g., webcasts, symposia, workshops, graduate courses, reports). These activities typically occurred near the end of a project; however, we did study a few projects with KM integrated throughout the project. We focused on understanding how information, mainly research information, could be mobilized to inform practice and policy decisions. A variety of evaluation tools (e.g., surveys, interviews, focus groups) and both quantitative and qualitative data were collected during and after the KM activities. From the beginning of the initiative, we strove to refine the KM framework by incorporating insights from the literature, KM experts, and our evaluation findings. We used this same process to revisit our conceptualization of KM and to improve the effectiveness of our KM activities.

Key Results

Knowledge mobilization is based, in large part, on relationship building and relationship maintenance through stand-alone KM events and the development and maintenance of ongoing networks (e.g., learning communities, community-based research partnerships). More specifically:

- KM is a social process engaging individuals and organizations as learners. Social interaction in the form of relationship building and maintenance is a critical component of the KM process, during and long after a KM activity has occurred.
- KM is a collaborative process through which research information is applied to practices and policies, and in which experience and knowledge from the community can be used to inform and guide research.
- Participants engage in and move back and forth between information dissemination, information exchange, and information utilization; these are all vital elements of the KM process.
- KM is influenced by the characteristics of the people involved (e.g., information purveyors; information users; children, youth, and families) and their key contexts (e.g., organizational, societal, cultural, historical). An understanding of these characteristics can help facilitate KM in how it is designed and implemented.

² To learn more about the conceptual KM framework and our recommendations, please see the MKAD report at: http://www.cup.ualberta.ca/index.php?option=com_docman&task=cat_view&gid=33&Itemid=234

Key Messages

The MKAD project was developed in response to the special challenges inherent in collaborative work spanning community and academic contexts. As a result of our work, and the initiative described in this chapter in particular, we have enhanced our understanding of how to facilitate the movement of research information as it is shared, exchanged, and applied to policy and practice in support of the development and well-being of children, youth, and families. We have developed recommendations for how to plan and successfully attend KM activities, (see Appendix). In the future, we hope to improve our understanding of KM further by studying: (1) ways in which community—campus knowledge and interaction can be effectively integrated throughout the KM process, and (2) additional elements of the KM process (e.g., decision making, evaluation of the impact of information utilization). In time, we hope to develop a theoretical KM framework that is supported by empirical evidence and has predictive capability—a framework that can contribute to the growing foundation of knowledge about KM.

About the Authors

Sherry Ann Chapman is Assistant Director (Lifelong Learning), Community-University Partnership for the Study of Children, Youth, and Families (CUP), Faculty of Extension, University of Alberta. She was the functional lead for Mobilizing Knowledge About the Development of Children, Youth, and Families: Focus on Knowledge Transformation and Learning (MKAD). Kelly Shaw is Project Development Coordinator, CUP. Having been an MKAD team member since 2008, she became Project Manager in 2009. With a Master's degree (Psychology), Kelly worked in the program evaluation branch of the Ministry of Finance, British Columbia prior to CUP. Tara Hanson, M.A. (Communications & Technology), is the Director of Knowledge and Partnership Development with the Alberta Centre for Child, Family & Community Research (ACCFRCR). Prior to joining ACCFRCR, she worked with the previous Alberta Mental Health Board.

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Appendix

The MKAD Handout – March, 2010

Planning Successful Knowledge Mobilization Strategies

Christine Delling¹, Kelly Shaw¹, Dorothy Pinto¹, Sherry Ann Chapman¹, Kym Schreiner²
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Planning Checklist

- Use multiple KM strategies (e.g., workshops, webcasts)
- Include diverse perspectives (e.g., research, practice, policy)
- Include various kinds of information (e.g., research, how-to)
- Make the information accessible (e.g., content, language)
- Include time for questions and answers (Q&A)
- Include networking breaks
- Facilitate group discussions (e.g., large and small)
- Work collaboratively – involve audiences in KM planning
- To facilitate change, address people with:
 - decision-making authority
 - education and experience
 - contexts that value the use of research in decision-making

How to get started:

CUP Knowledge Sharing Handbook:
www.cup.ualberta.ca → go to Documents tab

Research Impact: www.researchimpact.ca

CHIR KT Clearinghouse: <http://ktclearinghouse.ca/>

Or contact us

MKAD at CUP: www.cup.ualberta.ca
ACCFRC: www.research4children.com
or cdelling@ualberta.ca

This presentation was created as part of the Mobilizing Knowledge About Development (MKAD) project, a collaboration between the Community-University Partnership for the Study of Children, Youth, and Families (CUP) and the Alberta Centre for Child, Family and Community Research (ACCFRC).

Building Research Capacity and KT Through Educational Workshops

Heather Scarlett-Ferguson

Abstract

The complex mental health needs of seniors and persons with disabilities are often challenging. This research and knowledge translation initiative was developed in order to build capacity among caregivers to provide appropriate, accessible, and coordinated services using best evidence and practice-relevant research. To help facilitate this, educational workshops were created to increase knowledge of available funding for research and evaluation projects, about how to write a grant application, and about relevant ethics screening for these projects. To date, (October 2010), 97 people have attended the workshop, and all but one respondent reported an increased confidence in applying for grants. The author concludes that successful capacity building requires an understanding of the knowledge level and knowledge needs of your audience, an appreciation of the time barriers facing front-line staff, and the use of evaluations to inform the further refining of workshop content and delivery.

Background

The complex mental health needs of seniors and persons with disabilities are often challenging for caregivers. Caring for this population frequently requires the aid of community and government agencies as well as family members. Some community agencies may be less familiar dealing with the mental health needs of this population and may be unaware of the research evidence that may be used to support their activities in this area. Additionally, local solutions may be warranted. However they may not be feasible to investigate or implement due to fiscal or manpower restraints.

KT Initiative

This research and knowledge translation initiative was developed in order to build capacity among caregivers to provide appropriate, accessible, and coordinated services using best evidence and practice-relevant research. A Collaborative Research Grant Initiative: Mental Wellness in Seniors and Persons with Disabilities (CRGI) was developed in 2008 with the Alberta Ministry of Seniors and Community Supports and Alberta Health Services, Addiction and Mental Health. Part of the funding in this initiative focuses on the disbursement of grants to researchers and service providers to conduct collaborative, practical, and innovative research and evaluation projects. To help both promote and facilitate this, capacity building workshops were developed and delivered across Alberta to improve the capacity of service providers and community agencies to develop research proposals and apply for funding.

KT Strategy

Educational workshops were created to increase knowledge in three areas: (1) background information on the CRGI and the three levels of funding available for research and evaluation projects; (2) proposal writing tips and techniques; and (3) relevant ethics screening for research, evaluation, and quality improvement projects. Experts in each of these subjects were assigned to deliver the information in each of these three areas. The workshops were intended to target community agency staff, health sector workers, and interested academics. It was recognized

Building Partnerships, Building Capacity

that many attendees might be unfamiliar with proposal writing and ethics review, so the education was targeted for this audience level.

The workshops were offered across Alberta in various rural and urban locations, at no cost to participants. They were offered both face-to-face and via videoconference in order to reduce the amount of travel and/or time away from work for workshop participants. Locations were chosen upon advisement from the Ministry as to where their agencies' needs might be best served. Information about the workshops was disseminated via website, email, poster, and word of mouth.

Evaluation

Thirty-six people attended the first round of workshops. After the workshop was completed, participants were asked to complete an emailed survey to evaluate the workshops. The response rate was 28% with the majority of respondents rating the overall workshop as good or very good. All the respondents reported an increased confidence in applying for grants after having attended the workshop. Participants also expressed the desire for more case discussion time at the workshops, and wanted case studies to reflect the non-profit sector. In response to these and other comments on the evaluations, changes were made in the format and length of the workshops. It was also decided to videotape the workshop in order to allow people unable to attend to obtain the information, and 20 DVD's were subsequently distributed. A follow-up survey was later completed in order to determine whether workshop attendees had applied for grants. Results showed that of the nine respondents, only three had applied for a grant. Reasons cited as to why they did not apply included the general themes of work-related changes, lack of time, and systemic barriers.

Key Messages

Some of the lessons learned with this initiative include: (1) knowing the needs of your audience is key. We knew most of the people attending had little experience with research or evaluation and we needed to target our information to their knowledge level in these areas; (2) paying attention to frontline service providers' workload is important. As a result of their stated needs, the workshops were changed in both format and length to minimize time away from their clients; and (3) utilize evaluations to improve. An analysis of our data showed us areas where we could improve the educational experience for our audience and we responded to those needs immediately.

Researchers and service providers are enthusiastic about the opportunity to work collaboratively and advance research to enhance and promote the mental wellbeing of seniors and persons with disabilities. They appreciated the opportunity to network at the workshops and that information was provided to assist them in the grant application process. Overall, it appears to have been successful knowledge translation endeavor and it has met its original goal of building capacity for research. Further educational workshops for service providers are now being planned.

About the Author

Heather Scarlett-Ferguson is the manager of Knowledge Exchange in the Knowledge and Strategy area of Alberta Health Services – Addiction and Mental Health. Heather has a Bachelor of Science degree in Pharmacy, a Master's degree in Distance Education, and is completing a Doctorate in Education. Heather oversees the Addiction and Mental Health Research Partnership Program where she helps facilitate the translation of research knowledge into practice. This work involves a variety of stakeholders from across the province, including government, community and non-profit agencies, academia, and clinicians. Heather is particularly interested in virtual methods for knowledge transfer and knowledge translation in clinical healthcare practice, and is focusing her doctoral studies in this area.

Advancing KT for Diverse Populations and Mental Health

Brenda Leung, Carol Adair, Kwame McKenzie, and Steve Lurie

Abstract

Canada's immigrant, refugee, ethno-cultural, and racialized groups are exposed to risk factors for mental health problems such as migration, discrimination, and language difficulties. In 2009 the Mental Health Commission of Canada produced a report making recommendations for improving mental health services for IRER groups. The next phase of the project was to engage key policy-makers from Alberta Health Services, Alberta Health & Wellness, and Alberta Employment and Immigration in discussions about how this information could be used to inform policy, practice, and service change. Consultations focused on identifying barriers and facilitators to implementing the report's recommendations, the identification of goals and strategies to achieve them, and the development of key messages to influence organizational change. The authors conclude that KT benefits from the face-to-face engagement of policy makers, by providing opportunities for knowledge exchange, and by encouraging stakeholders to develop goals and strategies that are appropriate for their context.

Background

Canada is becoming more diverse each year as immigration is the driving force to population growth.⁸ Immigrant, refugee, ethno-cultural, and racialized (IRER) groups are more exposed to the known social determinants that promote mental health problems and illnesses as well as novel social determinants such as migration, discrimination, and language difficulties.^{1,2,6} Improving services and outcomes for IRER groups is a common challenge for mental health systems across Canada.⁹

The Service Systems Advisory Committee of the Mental Health Commission of Canada (MHCC) produced a report on the issues and options for service improvement for IRER groups (Hanson, et al, 2009). The report included 16 recommendations for service improvement, as well as some examples of how these ideas could be implemented (i.e., promising practices) in various parts of Canada. The full report is available on the MHCC website, http://www.mentalhealthcommission.ca/SiteCollectionDocuments/Key_Documents/en/2010/issuesandslides.pdf

The report is not a protocol for service development but an outline of the issues that policy-makers, health planners, and service providers across Canada may find beneficial to consider when embarking on strategies to improve mental health services for IRER groups. The goal for the next phase of the project was to develop an effective knowledge transfer (KT) plan by engaging people who are in key leadership positions in discussions about how this information could be used to inform policy and practice change

KT Initiative

The KT initiative undertaken was the first step in the process to develop a KT plan for the dissemination of the Issues and Options report throughout Canada. The KT initiative conducted in Alberta would serve to inform on similar initiatives in other provinces and regions in the country as well as to inform the development of knowledge exchange activities within the MHCC.

The objectives and expected outcomes of the proposed KT initiative were:

1. to identify the target group of people within Alberta with the ability to develop or change policy practice/services in mental health
2. to host a face-to-face knowledge exchange / transfer workshop in Calgary which included key stakeholders with which key messages would be shared about the recommendations and strategies for implementation
3. to use this process to identify barriers and challenges to the uptake of the recommendations for policy changes in the present context of healthcare changes in Alberta

The current status of the project is completion of the KT workshop, and evaluation at two time points. A third evaluation is currently underway, and analysis of qualitative and quantitative data is being conducted.

Audience

The target audience was executive directors, directors, and managers from Alberta Health Services (AHS), Alberta Health and Wellness (AHW), and Alberta Employment and Immigration (AEI). During the workshop, attendees were asked to provide input for:

1. how the report's recommendations may be applied at their work
2. the development of key messages that are likely to positively influence their organization's ability to make changes
3. assessing the barriers that may make it difficult to use the recommendations to inform policy and service improvement
4. assessing readiness and enablers for change in Alberta Health Services

KT Strategy

First a steering committee was formed, consisting of the project team members and key individuals previously involved in the Issues and Options report project. Also included in the steering committee were individuals with insights into the workings of mental health services within Alberta. A steering committee of 6 to 8 people met regularly to determine the potential people to invite to the KT workshop.

Second, we contacted participants from the Calgary consultation for the Issues and Options report. These participants were asked to nominate key members either in their organizations or in the wider networks of policy providers and services in Calgary who they considered responsible for making and changing policy and service delivery. A list of nominees was generated and reviewed by the steering committee. However, it was found that the nominees were not the target audiences we had set out to engage.

Advancing KT for Diverse Populations and Mental Health

A high-level individual from AHS was identified by one of the steering committee and contacted. The high-level individual provided names of key people within AHS who were in positions of making or changing policy at the administrative, practice, and service levels.

Other individuals in the academic and service sectors were also identified through further probing with key contacts within the steering committee and their network of contacts. Thus a final list of target audience members was developed, and an invitation was sent to each member to attend.

We employed strategies to facilitate KT of the findings that have been cited to be effective in the literature.⁵ These strategies included:

- provision of face-to-face exchange for participants using interactive cross-sector workshops
- involvement of stakeholders in positions of decision making as identified by our Calgary contacts
- provision of clear concise policy recommendations from consultation with participants
- ensuring that the research and recommendations are relevant to the intended audience

THE WORKSHOP

The goal of the workshop was to examine how to take the Issues and Options report to the next level. Attendees also came up with themes for key messages, and discussed immediate action items.

Issues and Options Report

- **Barriers to uptake of report**
- **Facilitation to uptake of report**
- **Opportunities for uptake of report**

Key Messages

Key messages that could be shared within Alberta Health Services (AHS) or other stakeholders:

- build on strengths: good things are happening now
- stay client/community-focused
- be inclusive: internally, externally
- sustain funding over time
- service for under-served populations
- embedding (building on existing programs and services)
- include diversity in AHS strategy documents
- communication (multi-level and multi-directional knowledge transfer)
- easier than you think, you can build it, we (the Mental Health Commission of Canada) can help

Action Items

Actions attendees would take to further the recommendations in their work:

- discuss at the provincial mental health committee
- share within organization (e.g., post on research website)
- integration into Addictions and Mental Health (AHS), clinical network and Alberta Health and Wellness
- link the recommendations to the AHS strategic plan
- include diversity assessments in patient care and work with families
- develop mental health literacy for physicians; train students (part of curriculum)
- share learnings from workshop with colleagues

Results

Of those invited to attend the workshop, 15 individuals attended, six declined, and two individuals did not reply. Most attendees were from AHS, including personnel from Addictions and Mental Health, Alberta Health Services, Knowledge and Strategy, and Reducing Disparities, Population and Public Health Calgary.

The workshop was held May 4, 2010 in Calgary. The day started with introductions of all the attendees. Then, Dr. Kwame McKenzie provided an overview on how the Issues and Options paper for immigrant, refugee, ethno-cultural, and racialized (IRER) groups was developed for the MHCC and noted that the purpose of the meeting was to look at how to get the report to the next level.

Following Dr. McKenzie's presentation, attendees were divided into three groups, each group with a facilitator. Attendees were asked to identify barriers, facilitators, and opportunities to implementing recommendations from the report. As well, attendees were asked to provide some key messages from the discussion that could be developed to be delivered to other key stakeholders in similar positions within AHS or other governmental organizations.

Evaluation

To measure the impact of this KT initiative we are using a mixed methods approach to whether the target audience was adequately identified and engaged, and whether the message and mode of delivery were effective in transferring the knowledge. We applied Kirkpatrick's framework in evaluating the impact of the KT process.⁴ We also used open-ended qualitative questions to solicit barriers and facilitators to implementing the recommendations.

A standardized questionnaire with closed-ended and open-ended questions was used to collect stakeholder responses. Closed-ended questions, modeled on stages of change questionnaires,⁷ assessed participants' confidence in applying the results. Responses to open-ended questions were collated and analyzed for common categories and themes. Content analysis of the qualitative data will provide insight into the uptake of the KT messages and modes of delivery, as well as identify potential barriers to uptake. The questionnaire was given two days prior to the workshop, within two days after the workshop, and at three month after the workshop.

Key Messages

There were a number of lessons we learned from this KT initiative. In moving the information from the report forward, we learned that:

- as an engagement strategy our methods were able to target the key people within key organizations
- the one-to-one meeting helped people to network internally and share the work they were doing within their respective areas. As an external group, our involvement validated their work and energized them. For example, the Mental Health Capacity Building for Children, Youth and Families Initiative, a partnership between AHS and Alberta Education, taking place in the city of Brooks provided grassroots community involvement in promoting mental health and preventing mental illness in the culturally diverse community
- when approached in a sensitive manor, it was possible to get people together to discuss and reflect on the issues, and to provide input on how the report could be positioned in order to be most helpful to them

- the importance of engaging key people early in the process of developing a KT plan. The intent of the report was to have broad appeal and resonance with diverse audiences, e.g., from governments to community workers to consumers. Thus, identifying the key audience who influenced policy and practice change after the report was produced was a challenge.
- the need for continuous engagement. We found having one workshop was insufficient and that we need to provide repeated opportunities for engagement over time to sustain change, to move knowledge from an area of preparedness to change.

Finally, a key message for researchers embarking on developing KT plans is that the KT initiative was informative but the lessons presented here require consideration of how to translate knowledge to action over time, using techniques such as communities of practice and leveraging technology to keep costs down.

About the Authors

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Building Capacity through Knowledge Products

Melissa Schock

Abstract

In today's high pressure society, individuals are experiencing higher levels of mental health issues such as stress, anxiety, and depression. With an abundance of information available on mental health, it is difficult for health promotion and chronic disease prevention practitioners to find consistent, evidence-based messages applicable to their work. The Alberta Healthy Living Network (AHLN) undertook an initiative with the objective of developing Integrated Mental Health Common Messages including healthy eating, active living, and a tobacco-free lifestyle. The development of this document included evidence-based information gathering, focus group testing, and expert review. Focus groups were a necessary stage of development to ensure that the messages resonate with end-users. The Common Messages have since been disseminated via the Internet, presentations, and community health events. The author concludes that evidence-based Common Messages are useful tools that assist practitioners in transferring knowledge more effectively to their clients.

Background

With the increasing pressures of today's society, individuals are experiencing higher levels of mental health issues, including stress, anxiety, and depression. As such, mental health has become an important topic within the province of Alberta. With an abundance of information available on this topic, it is difficult for health promotion and chronic disease prevention practitioners to differentiate quality sources of information, to find consistent, evidence-based messaging that is targeted and applicable to their line of work. The public also has access to this plethora of information via the Internet. Often times this information provides conflicting messages, which causes confusion and may even undermine the efforts of practitioners.

The former Alberta Healthy Living Network (AHLN) undertook an initiative to develop *Integrated Common Messages for Mental Health* for use by health promotion and chronic disease prevention practitioners. As part of this initiative an additional tool, the *Best Practices Framework for Developing and Disseminating Common Messages*, was created as a comprehensive approach to work in this area. The need for this initiative was identified and supported by the AHLN Awareness and Education Working Group. The aim was to build capacity for practitioners by developing practical tools centered on evidence-based information, reassuring practitioners of the reliability of the resource.

KT Initiative

The AHLN was a provincial network of organizations formed with a mission to promote health and prevent chronic disease in Alberta. To achieve this goal, evidence-based resources were created to build capacity for practitioners and to support them in their work.

The AHLN developed *Integrated Common Messages for Mental Health*, focusing on mental health integrated with healthy eating, active living, and a tobacco-free lifestyle. "Common messages is defined as messages that provide consistent, clear recommendations and information for both practitioners as well as the public. These common messages demonstrated that healthy living and chronic disease prevention are dependent upon many factors that improve the health of the population and reduce the risk of chronic disease."¹

Building Capacity through Knowledge Products

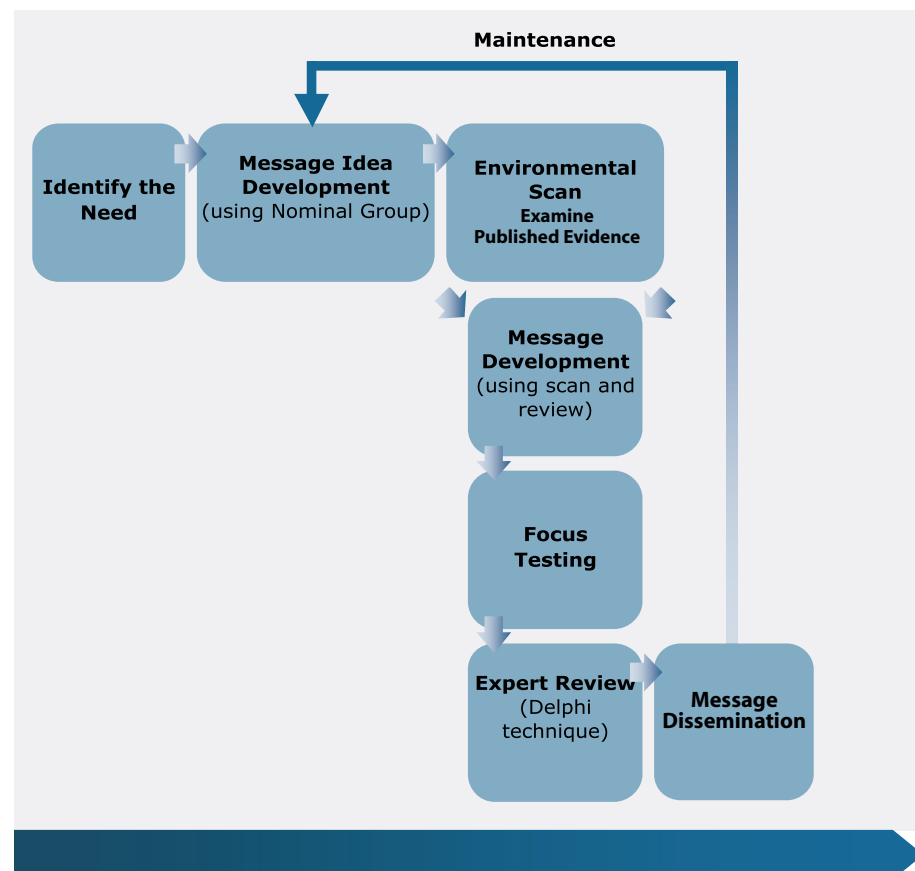
To aid in the development of clear, consistent, evidence-based messages, an additional tool was produced. The *Best Practices Framework for Developing and Disseminating Common Messages* outlines step-by-step instructions on how to develop common messages. This framework has proven to be a vital component of this initiative. What resulted were four sets of messages: mental health and the integration of mental health, with healthy eating, active living, and a tobacco-free lifestyle. Each set has a consistent format that includes: common messages used for educational purposes; tips; websites for further information; and, evidence sources and additional resources. Of note, the information provided in the messages refers only to the general population.

The *Integrated Common Messages for Mental Health* as well as *Best Practices Framework for Developing and Disseminating Common Messages* were completed and later endorsed by the AHLN Coordinating Committee in December 2008.

Methodology

Best Practices Framework for Developing and Disseminating Common Messages is a tool developed by a private consultant specifically for this initiative, in order to guide the development of clear, consistent, evidence-based messages. The *Best Practices Framework*, tested for effectiveness and validity as it was utilized in this initiative, provides a flexible process with detailed instructions to aid individuals and organizations in the development of effective and evidence-based common messages. The process for developing the messages includes evidence-based information gathering, expert review, and focus group testing.

Figure 1: Overview of the process for developing evidence-based common messages (*Best Practices Framework for Developing and Disseminating Common Messages*, AHLN, 2008).



Building Partnerships, Building Capacity

Based on the process outlined in the *Best Practices Framework*, the messages were focus group tested, in both Calgary and Edmonton, with an additional focus group held via teleconference for those unable to attend a face-to-face session. All participants of these focus groups were part of our target audience (health promotion and chronic disease prevention practitioners) and specialized in at least one of the focus areas of the messages (mental health, healthy eating, active living, and a tobacco-free lifestyle). Each participant reviewed the messages to ensure they were accurate and resonated with them, and to identify areas requiring clarification. In addition, information was gathered during these sessions regarding preferred methods of knowledge transfer to aid in the preparation of a dissemination plan that would address these knowledge transfer preferences. The *Best Practices Framework* was created and endorsed by the AHLN in 2008.

Audience

The end-users of the *Integrated Common Messages for Mental Health* are health promotion and chronic disease prevention practitioners, and the end-users of the *Best Practices Framework* are individuals and organizations pursuing the development of common messages.

KT Strategy

In addition to the focus group method outlined above, another important strategy utilized in this project was expert review. Well-known experts in each of the content areas (mental health, healthy eating, active living, and a tobacco-free lifestyle) were identified and contacted about the initiative. Each expert reviewed the messages and provided feedback through a questionnaire format (agreement/non-agreement with each message and with feedback opportunities). Feedback was gathered and used for further revisions of the messages.

Results

Four sets of common messages were created: mental health specific; mental health integrated with healthy eating; mental health integrated with active living; and, mental health integrated with a tobacco-free lifestyle.

Following endorsement in December 2008 by the AHLN Coordinating Committee, a dissemination plan was created and enacted, based upon a communication plan prepared by the consultant. This included posting the common messages on the AHLN website and on affiliated member websites, dissemination through other online sources (such as the AHLN Listserv), presentations to respective organizations, and utilization of the common messages at community health events.

Verbal feedback from AHLN stakeholders who utilized the common messages was very positive. One particular stakeholder reported using the messages at a community health event, where she tailored the format of the messages to appeal to the audience. As a result, the messages were well received by the audience. In addition, the AHLN received feedback from some organizations that were using the *Best Practices Framework*. This feedback was again very positive and reinforced the reliability of this resource.

Building Capacity through Knowledge Products

Following the completion of the development of the resources, an evaluation report was prepared by the consultant. This report outlined the processes used in the development of the common messages, evaluated successes and challenges, and provided suggestions for future use. Unfortunately the AHLN dissolved at the end of 2009 and thus a formal evaluation was not completed. It was the desire of the AHLN upon dissolution that the resources would continue to be considered valuable and to be utilized by practitioners in the future.

Both of these resources can be found on the University of Alberta's School of Public Health website at the following address:
http://www.publichealth.ualberta.ca/multimedia_resources/docs_reports/ahln.aspx

Key Messages

- Common messages are useful knowledge products, which allow practitioners to transfer knowledge more effectively to the public.
- The information used in the development of common messages must be evidence-based.
- Focus groups are a necessary part in the development process to ensure the messages resonate with practitioners.

About the Author

Melissa Schock has worked for several years in Alberta's health care environment, previously with Calgary Health Region and Alberta Cancer Board. During this time she was the program support coordinator for the Alberta Healthy Living Network (AHLN) until its dissolution in 2009. In this role she coordinated a variety of projects, including the initiative outlined in this article and was responsible for knowledge transfer with the AHLN's stakeholders.

Melissa is currently a knowledge exchange coordinator with the Decision Support Strategies Team of Public Health Innovation and Decision Support, Alberta Health Services. In this role Melissa is able to enhance stakeholder relations through the development and use of creative knowledge products and tools that meet the needs of the department's stakeholders.

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Development of a Cross-Sectoral Knowledge Translation Plan

Maria Mayan, Cheryl Gagnier, Sanchia Lo and Jane Drummond

Abstract

Knowledge translation that promotes positive health outcomes for low-income families is a critical challenge for communities and governments across the country. Barriers to these positive outcomes include the complex interactions of the social determinants of health, the fragmentation of support services across sectors, and a lack of coordination among those services. The Putting Research to Work partnership acknowledged that the first step to begin addressing these challenges is to develop a KT plan that is appropriate for cross-sectoral knowledge translation. Following an integrated KT approach, PRW utilized interviews, focus groups, and participant observation to inform the development of a comprehensive plan for KT activity across multiple sectors. The authors conclude that positions of leadership and influence must be earned in an integrated KT project, that a faith in research is insufficient to mobilize it into action, and that different knowledge products are required for different audiences and purposes.

Background

Knowledge translation that promotes positive health outcomes for low-income families is a critical challenge for communities and governments across the country. Three issues underlie this challenge. First, the social determinants of health (SDOH) interact in complex ways and powerfully influence the health of low-income families. Second, services for low-income families typically operate at all system levels (e.g., community, municipal, regional, provincial, federal) and are organized by sector (e.g., health, education, employment, immigration, children's services, justice), but effective delivery of services is severely hampered by minimal collaboration among levels and across sectors. Third, in this fragmented environment, policies and practices that are supported with evidence from research are difficult to implement and timely applications often are missed.¹

Families First Edmonton

The *Putting Research to Work* partnership acknowledged that the first step to begin addressing these challenges is to develop a knowledge translation (KT) that is appropriate for cross-sectoral knowledge translation. The PRW partnership emerged from Families First Edmonton, a 10-year-old research partnership that is conducting a longitudinal, community-based, randomized controlled trial (RCT) of four models of delivering health and social services to low-income families. Funded by several agencies (CIHR, CHSRF, AHFMR, and others), Families First Edmonton includes 15 funder, government (provincial, regional, municipal), service delivery, community, and university partners. By developing the partnership (2001–2005) and by implementing interventions and studying outcomes (2006–2012), Families First Edmonton has generated strong and extensive data that will be used by PRW to address the pressing questions of partners in three critical areas:

1. the health and well-being of over 1100 children and their families over three years, with 1400 variables--including demographics, SDOH, (e.g., ethnicity, immigrant status, aboriginal status, educational attainment, training programs, labour market attachment, housing, community participation, social support, access to services/community programs), and health outcomes (e.g., school achievement, adult mental health, child mental health, quality of life)

Development of a Cross-Sectoral Knowledge Translation Plan

2. service delivery dynamics for low-income families (e.g., family strengths and challenges, awareness and knowledge of health and social programs, engagement with preventive health and social services) and service integration practices (e.g., working from a strengths-based, family-centered, and diversity perspective)

3. intersectoral collaboration (e.g., leadership, governance)

Evidence-based approaches often fail because valid and generalizable evidence is missing. Families First Edmonton data are current, cleaned, and extremely relevant to organizational and cross-sectoral decisions about policies, programs, and practices across the country regarding health outcomes for low-income families. Consequently, the research team has already been flooded with requests from current partners and others for data analyses to assist in organization and system planning. PRW partners view the current situation as an exceptional opportunity to “put the Families First Edmonton data to work,” and thus, spent the last year developing a comprehensive KT plan that balances the needs, interests, and constraints of funders, decision-makers, service providers, community leaders, and researchers in their efforts to enhance the well-being of low-income families.

KT Objective

The objective of *Putting the Research to Work: Development of a Cross-Sectoral Knowledge Translation Plan* was to determine the processes and structures important in the development of a cross-sectoral KT plan.

Methodology

The three main data collection strategies were participant observation, interviews, and focus groups. Participant observation notes were taken at meetings to document interactive processes underlying how questions were generated, how KT roles and responsibilities were identified and enacted, and how decisions were made about knowledge products. Interviews and focus groups were conducted with partner decision-makers and other stakeholders to add to the insights gained from participant observation data.

Audience

PRW partnership, made up of funders, decision-makers, community organizations, community leaders, and academics are eager to actively participate in the KT process and to create opportunities to apply the knowledge gained within and across their systems.

Putting the Research to Work (PRW) Governance

PRW Steering Committee

Consists of senior members within the PRW team

- oversees putting research to work
- responsible for funding



Project Management Core Team

Led by project manager & community knowledge facilitator with selected PRW partners

- manages develops knowledge transfer plan & its products
- manages/develops PRW communications plan



Policy and Action Working Group

Consists of senior members within the PRW team

- identifies/develops relationships within/across systems
- identifies/prioritizes systems' priority questions related to data
- participates in research meetings; collaborative data analysis
- identifies focal points for coordinated/collaborative action



Partner and Research Data Analyses Group

Consists of relevant partners that identified the issue

- content specific
- e.g., housing



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Consists of relevant partners that identified the issue

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- e.g., housing

Community Learning Network

Consists of service agencies & past FFE committee members

- promotes evidence and its value within their spheres of influence
- identifies program and service improvements relevant for the broader community
- provides input, feedback, idea generation for knowledge transfer products
- provides context for and impacts of evidence/data

Legend:

Responsible to

Communicates with

KT Strategy

Since its inception in 2000, Families First Edmonton has utilized an integrated KT approach to develop and implement the research project. The same approach will be used throughout the Putting the Research to Work KT process. This process involves three main activities. First, a project-specific PRW governance structure (see previous page) has been established to develop queries for the Families First Edmonton data, analyze and interpret data, and design and implement health-related policy, program, and practice-specific KT products. These products could include workshops, training programs, educational curriculum, films, podcasts, websites, or reports. Second, outcomes in the form of changes to policy, programs, and frontline practices will be documented. Third, once the data is available about how the products and processes have been developed, implemented, and evaluated, an integrated model for KT will be explicated.

An example of how these activities can yield KT products was provided recently in a Families First Edmonton, CIHR-funded study by Mayan, in which female-led, low-income families revealed their experiences in accessing health and social services. Partners urged that the findings of the study be used to create a KT product. With partners' and participants' support, the findings are now illustrated in a professionally developed film, *Bureaucrazy*, that is being used for decision-making (e.g., at meetings of government decision-makers) and for training purposes for those who work with low-income families (e.g., social workers and public health nurses).

Results

A comprehensive KT plan has been developed to enable flow of KT activity and uptake of research findings within and across multiple sectors. Elements of the plan include a governance structure, communications plan, and proposed KT products. This KT plan will be transferable to a variety of settings where governments and communities are partnering to bring about program and policy changes for promoting the well-being of low-income families. PRW is now in the process of implementing the KT plan as our partners work together to “put Families First Edmonton research to work” and develop our own cross-sectoral KT model.

Key Messages

Key learning from the development process of the KT plan includes:

- Traditional power is replaced by earned power. Leadership no longer automatically resides with those who hold “titles.” Instead, the partners who demonstrate commitment and contribution to the project earn acknowledgement and respect from others in the partnership.
- Faith in researchers and data value is no longer enough to move research into action. Uptake and application of research knowledge by government and community members will require deliberate action, resources, and KT planning by both the researchers and partners.
- Partners need to have research products usable for specific audiences and purposes. Different tool kits and formats are needed for different audiences, to promote the value and use of research findings.
- Partners need to maintain a delicate balance between momentum and patience. Balancing and managing the unknowns and challenges of the KT process, and the eagerness to receive and apply data, with the different timelines across sectors will be critical to maintaining partner commitment throughout the journey.

About the Authors

Maria Mayan is an assistant director with the Community University Partnership for the Study of Children, Youth and Families and an associate professor at the Faculty of Extension, University of Alberta. Cheryl Gagnier is a social worker with the City of Edmonton, Community Services and Project Coordinator, Putting Families First Research to Work. Sanchia Lo is a research coordinator with the Community University Partnership for the Study of Children, Youth and Families at the Faculty of Extension, University of Alberta. Dr. Jane Drummond is a professor at the Faculty of Nursing, University of Alberta.

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Alberta Infection Prevention and Control: Stop Bad Bugs

Vivian Lai, Lynn Olenuk, Carol Blair, Dominika Warchol,
and Joanne Mueller

Abstract

Preventing the spread of infections in senior's supportive living contributes to the multiple core objectives of Alberta Health and Wellness and Alberta Health Services. To address the lack of formal training, oversight, and evaluation, this initiative began with an assessment of supportive living operator needs and responded through the creation of print materials, an interactive website, and workshops for frontline staff and supervisors. To date (October 2010), over 4,800 staff and supervisors have been trained in workshops. A survey of workshop participants indicates that staff view the program as informative, helpful, and clear. Ongoing evaluation in 2011 will focus on information retention and the impact on resident health. The authors draw a number of key lessons from their experience, including the necessity of engaging front line staff in the development of materials, the need to plan for long term sustainability, and the benefit of utilizing real time evaluations.

Background

The lack of consistent formal training coupled with high acuity of residents and the lack of professional staff oversight were identified as high risk situation, for the spread of infection in seniors' supportive living settings.

KT Initiative

The Alberta Infection Prevention and Control Education in Supportive Living project contributes to four important objectives paramount to Alberta Health and Wellness and Alberta Health Services and other stakeholders in the supportive living sector: to prevent and control the spread of infectious disease in supportive living and lodge settings; to protect the health of Albertans; to ensure safe health care practices; and to increase public trust in the health care system.

KT Strategy

The training program is based on an assessment of supportive living operator needs with the intent of improving infection prevention and control knowledge and procedures in front line staff as per CHICA-Canada core competencies. The program makes extensive use of print materials, workshops, and an interactive website:

- Print materials. The information presented in the print materials was identified and developed based on an extensive survey of supportive living operator needs, a review of internationally available IPC education materials, and the guidance of the project steering committee. Available materials were modified extensively to suit the target audience. The materials were reviewed for accuracy and currency by an IPC physician and edited to a grade eight reading level by a professional editor. Materials include easy-to-read booklets, a PowerPoint presentation with an imbedded video on respiratory etiquette, and a binder containing detailed IPC information.



- Workshops. Workshops are generally conducted on-site to maximize attendance and reduce operator staffing expenses. To maximize retention, workshops encourage interaction by including live demonstrations, and promote discussion by closely following adult education principles. The workshops are conducted by trainers recruited for their knowledge and experience in IPC and adult education. Two types of training are provided:
 - *Front line staff training* is provided on-site at the supportive living setting. The workshop is three hours long, with each information module lasting 20 minutes to give sufficient time for demonstrations and discussions. The intent of the workshop is to educate staff about IPC. Topics include the chain of infection, hand hygiene and respiratory etiquette, personal protective equipment, cleaning of work areas, and outbreak management.
 - *Supervisor training* is provided at a community level or on-site at the supportive living setting. Each workshop is five hours long, and includes interactive exercises conducted with the trainer, discussions, and a video. The intent of the workshop is to encourage and sustain IPC behaviour change and knowledge; topics include: assessing staff's ability to change behaviour, factors that affect behaviour change, helpful interventions, creating a positive change culture, and methods for successfully sustaining behaviour change.
- Website. The interactive website (www.AlbertaIPC.ca) was developed to encourage the building of an IPC community, sustain knowledge by promoting discussions on IPC topics, and to encourage feedback on IPC concerns, effective practices, and the experiences of supportive living operators, supervisors, and staff. The website provides up-to-date answers to IPC questions posed during frontline staff workshops, as well as digital versions of print materials, and will be hosting a video of an IPC training workshop.

Over 300 supportive living settings exist throughout Alberta. They range from small operators with four to 10 residents to large campuses of care with over 100 residents. Three waves of training (October 2009 to December 2009; January 2010 to June 2010; September 2010 to December 2010) are being provided to reach all these settings. All operators of supportive living settings received mail registration packages, email reminders, were contacted by phone, and received reminder postcards. A logistics coordinator also created training "routes" in rural Alberta, to efficiently provide training to outlying facilities.

Evaluation

To date, 4,620 staff have been trained in 346 front line staff workshops in 204 facilities. An additional 184 supervisors have been trained in 25 supervisor workshops.

Evaluations will be conducted between January 2011 to March 2011 and will focus on staff information retention and impact on resident health. Current performance measures focus on the value of the information. The following table summarizes average respondent ratings (on a scale of one-to-four)

	I learned new IPC information	This information will help me in my work	Materials were clear and useful	Training met my expectations
South	3.57	3.62	3.63	3.64
Calgary	3.54	3.66	3.64	3.62
Central	3.51	3.65	3.69	3.68
Edmonton	3.54	3.69	3.71	3.70
North	3.69	3.72	3.75	3.76
Average	3.57	3.67	3.68	3.68

Attendees highly praised the workshop and indicated that everything taught in the workshop was useful. Many attendees found the Hand Hygiene and Respiratory Etiquette module and the related demonstration and video especially useful.

The workshop presentations received high ratings in format and approach, demonstrations and trainer presentation skills. The interactive component of the workshop was often praised, as it kept the presentation engaging and interesting. The overall value of the workshop was reinforced by the large number of attendees who indicated that the workshop improved their knowledge and attitude about IPC.

A sample of typical comments made by attendees:

"This is probably one of the most important in-services I have ever attended! I fully intend to do everything I can to pass this info on to the HCAs and clients I work with ..."

"All points made were well planned and carried out, very easy to follow. Lots of important information taught clearly and very well."

"The workshop trainers were the best we had."

Key Messages

- *Conduct a needs-assessment to develop relevant needs-based materials.* An extensive survey of SL operator needs was conducted and compared to the CHICA core competencies. This information was used to create materials that were up-to-date and matched operators' top-of-mind concerns.
- *Use up-to-date information and focus on best practices.* Due to the dynamic and changing nature of IPC and supportive living, best practices are continually updated. All information included in print and digital materials was checked against scientific literature and further validated by an IPC expert for correctness and currency. Although print materials are fixed, the website provides a dynamic set of IPC FAQs with up-to-date information and updated digital versions of printed materials.

Alberta Infection Prevention & Control: Stop Bad Bugs

- *Use dynamic presentation to promote interest and retention.* Information presented during workshops is kept understandable with a strong focus on clear and memorable concepts. Multiple channels are used to promote retention, including audio (videos and the trainers), visual (videos, projected PowerPoint slides, and printed materials), and tactile (fun, hands-on demonstrations). Engagement is facilitated by using dynamic and interactive trainers and by incorporating 20-minute teaching segments that allow time for discussion.
- *Encourage competent and dynamic trainers.* Trainers recruited are experienced and knowledgeable in IPC and/or training. Additionally, all trainers completed a comprehensive orientation program to support their IPC knowledge and improve their skills as adult educators. The trainers are provided with refresher sessions every six months, and are provided with continual support (a single point of contact deals with any logistical challenges and any difficult IPC questions).
- *Plan for sustainability.* Sustainability of IPC knowledge and behaviours outside the workshops is encouraged by the IPC website, where operators can research and encourage each other's IPC initiatives. FAQs are regularly posted as they arise through workshop discussions. An IPC video production, soon to be posted on the website, also facilitates sustainability and provides continual access for staff training. The supervisors' workshop on behaviour change also facilitates ongoing attention to positive IPC behaviours. The intent is to instil confidence and create a supportive community and quality culture in which staff and supervisors can confidently implement and sustain IPC behaviour change initiatives.
- *Master logistics.* A single point of contact for logistics coordination and ongoing contact with SL operators is critical. The logistics coordinator builds relationships with facility educators and managers that ensure workshops are attended and trainers are aware of the environment in which they will be teaching. The logistics coordinator also acts as a single source of contact for operators who have questions about the IPC training program.
- *Perform real-time evaluations and adjust accordingly.* Workshops have a built-in assessment component. Each workshop generates attendee feedback forms and trainer feedback forms, and these forms are regularly analyzed to determine what is working and what needs to be improved in the program. Furthermore, the evaluations serve to identify IPC questions for the website. The program and the website are adjusted as needed, to ensure ongoing relevance in meeting IPC educational needs.

About the Authors

Alberta Health Services and Alberta Health and Wellness are offering infection prevention and control (IPC) training for front line staff who work in supportive living. Supportive living sites selected for this training include senior citizens' lodges and assisted living/designated assisted living settings. A website has been developed to promote discussions on IPC topics and encourage feedback on IPC concerns, effective practices, and the experiences of supportive living operators, supervisors, and staff. The site also serves as a central repository of workshop materials. Carol Blair and Associates Inc. is an independent consulting firm that has been contracted to assist with this project, to manage the website, to aid in materials development, and to develop and conduct the training workshops.

Navigating the Delirium Knowledge Transfer Stream

Paul Wishart

Abstract

Post-surgical delirium in the elderly is a significant predictor of adverse outcomes, with mortality rates approaching 30%. The objective of this KT initiative is to improve the recognition of delirium using a validated screening tool, as well as to promote delirium prevention and treatment. This project follows an integrated KT approach in engaging key stakeholders to collaboratively identify barriers and enablers to better delirium care. Initial results indicate that the “messiness” of KT is a significant barrier to implementation, but that the desire to make a difference is an effective motivator for overcoming this barrier. The author concludes that relationships with front line staff are essential to accessing their perspectives, building trust, ensuring buy-in, and building upon success.

Background

This knowledge transfer initiative addresses the medical emergency of post-surgical delirium in the elderly.^{1,2} Delirium is a significant predictor of adverse outcomes, the most significant adverse event being death.³ Other adverse events associated with new onset of delirium in hospital are increased length of hospital stay and greater rates of nursing home placement, with mortality rates approaching 30%.^{4,5,6} Delirium is a multifactorial affliction. Its shared symptomatology with other related cognitive disorders, such as depression and dementia contribute to delirium being under-recognized in the post-surgical patient.²

KT Initiative

The objective in this Knowledge Transfer (KT) initiative is to transfer the knowledge of dealing with delirium in the elderly into practice, and to evaluate the effectiveness of the initiative. To accomplish this, the recognition, treatment, and prevention of delirium in post-surgical patients must be improved. To do this we are addressing three areas:

1. pre-surgery (Pre-Admission Clinic; pre-surgery risk factors for delirium)
2. post-surgery (Oncological Surgical Recovery Unit; observation post-surgery)
3. indicators of delirium (introducing a validated delirium screening tool)
4. using Grounded Theory (GT) to:
 - a. generate the main concern of transferring knowledge into practice
 - b. determine the means of effectively addressing this main concern, and
 - c. evaluate the effectiveness of this KT initiative to decrease adverse effects associated with delirium post-surgery

Navigating the Delirium Knowledge Transfer Stream

To support this initiative we will derive base line cognitive information for patients pre-surgery. This will be accessed by nursing staff and surgeons post-surgery, as well as providing a validated delirium screening measure for nursing staff post-surgery. This will lead to improved documentation of cognitive observations by nursing staff. Better documentation supports improved recognition of delirium by nurses and physicians. Better recognition leads ultimately to improved treatment and prevention of delirium as well as evaluation of the knowledge transfer initiative. If delirium can't be recognized, treatment, prevention, and evaluation suffer.

This project is currently in the evaluation phase. The main concern of the delirium knowledge transfer initiative has been generated, that of dealing with the messiness of knowledge transfer. How this concern is being resolved is demonstrating that the knowledge transferred into practice is "making a difference." This is presented below in the "Results of the Initiative" and "Key Messages" sections.

Methodology

Grounded Theory (GT) is the methodology informing this KT research initiative.⁷⁻¹¹ GT is the scaffolding that directs the development, implementation, and evaluation of this initiative.

The emphasis in GT is on determining "what is going on" in the area of inquiry. In the analysis of the data, the main concern or obstacle to delirium knowledge being transferred into practice is derived. The main concern is connected with how this main concern is being resolved in dealing with delirium in the elderly in healthcare.

Grounded Theory is congruent with both the goal of the delirium research project and with the KT process itself, as the obstacles and facilitators of the knowledge transfer are addressed within the theory generated. The question and the answer emerge from the analysis and generation of the theory. This increases the contextual relevance of the theory.

Audience

Front line nursing staff are included in the audience. Their immediate supervisors in nursing and surgery are also included as a primary line of accountability, developed previously.¹² Engagement of the Lead, Specialized Geriatric Services – Alberta Health Services includes both a clinical nursing geriatric/education specialization and policy maker connection. The researcher is affiliated with surgery, connecting surgery and the nursing staff to facilitate KT and evaluation.

Front line nursing staff dealing with delirious patients post-surgery are connected with base line data of risk factors from the pre-admission clinic. A validated delirium screening tool is implemented in post-surgery nursing practice. Post-surgery nursing observations related to delirium are connected with pre-admission risk factors. Baseline data is connected with post-surgery reality. Connecting pre-admission and post-surgery data informs recognition, treatment and prevention, and evaluation. And the profile of delirium is increased through educational opportunities developed with the staff and administration. This puts this knowledge transfer initiative in the best place for demonstrable efficacy.

KT Strategy

The stakeholders in this initiative have been integrated into the project, as they were engaged during the previous project's recruitment stage.¹² During both the previous project and this project, barriers and enablers of delirium KT have been identified and addressed collaboratively.^{1,12,13} The obstacles are identified and addressed proactively through cultivating relationships, which facilitate knowledge transfer. The main obstacle and how it is resolved are presented below in the "Results of the Initiative" and "Key Messages" sections.

Several KT strategies have been used to involve and engage the various stakeholders in this knowledge transfer initiative. Targeted face-to-face presentations have been welcomed during rounds, staff in-services and education days.^{14,15,16,17} Mentor relationships have been initiated and cultivated.¹⁸ The PI has served as a knowledge broker within the nursing units, working collaboratively with clinical nursing specialists and educators.

Opinion leaders have been engaged and involved within Alberta Health Services through updates and presentations on this knowledge transfer initiative, with regard to both delirium specifically and knowledge transfer generally.

Conference presentations and workshops have also been developed and presented on Delirium Knowledge Transfer and on the more general processes of Knowledge Transfer and Grounded Theory.^{13,19,20,21,22,23} In addition a paper dealing with the relationships between generalists and specialists and healthcare has been accepted for publication.²⁴

Results

The results of this initiative are:

1. Dealing with the "messiness of KT" is identified as a significant concern and obstacle for implementing and evaluating KT.
2. "Making a difference" is an effective motivator for KT and a means of resolving the messiness encountered in KT.
3. Sometimes it is the messiness that actually facilitates KT. It is the relationships cultivated that determine whether KT is effectively implemented or rejected. Don't leave out the messiness or the relationships.

Key Messages

A pleasant surprise from this delirium knowledge transfer initiative was the strong resonance and relevance associated with the imagery of the knowledge transfer stream (see Figure 1). The image of the stream connects well with nursing staff, their supervisors, physicians, administration, policy-makers, researchers, and patients. The stream illustrates the basic process of connecting information, and its effective flow amongst specialties and stakeholders, across administrative structures, policies, and people.

Another surprise was the contribution delirium makes as a teaching metaphor informing knowledge transfer. One benefit was an increased sensitivity in connecting effectively with patients, family, and staff along the KT stream.

The perspectives of front line staff and of demonstration are crucial to effecting KT and sustaining it. Acknowledging and dealing with the messiness have increased the trust of those involved in

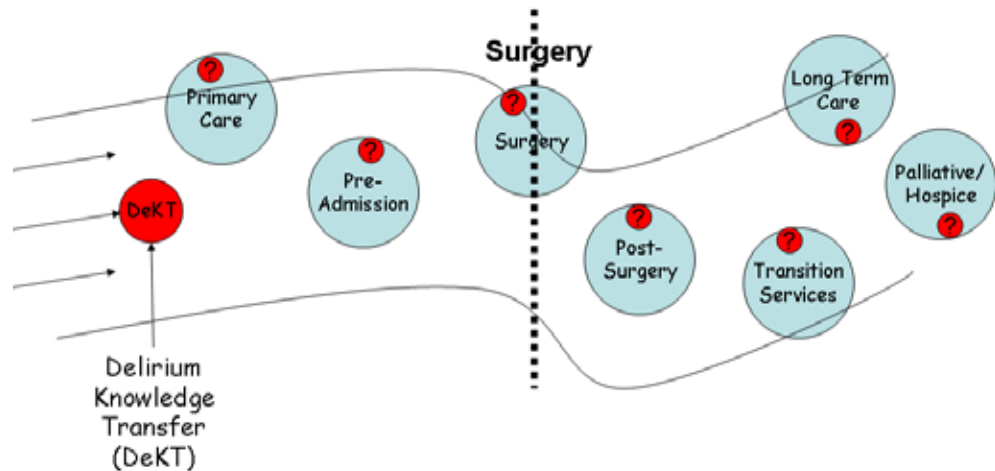


Figure 1: The (Delirium) Knowledge Transfer stream. ^{1,13,19,20}

implementing this KT initiative, evaluating it in the clinical setting, and building upon it. We have demonstrated that “making a difference” is an effective motivator for KT in the clinical setting.

An attribute of delirium, that of disorientation, has emerged as an excellent sensitizing concept in transferring knowledge into practice. The volume of information confronting staff can be overwhelming. Forcing more into the stream as knowledge transfer can, ironically (and significantly) contribute to disorientation of the staff. Contributing to disorientation actually reinforces the delirium trajectory through interactions with the staff and through a trickle-down effect along the stream. This sensitivity has provided greater patience and timing in discerning when and how to influence ether delirium knowledge transfer stream.

The value of transferring knowledge in such a manner that the concepts being transferred connect experientially was well illustrated in patient recruitment in the initial study.¹² The first question from the patient or those accompanying the patient is, “What is delirium?” I developed a response intended to connect with common experience “It’s like when you become loopy from a fever; when you don’t know what day it is or where you are.” I would the mention disorientation with respect to place and time, that it is rapid onset, and that it fluctuates (Paul Wishart, Jan. 29, 2008. paraphrased).²⁵ This seemed to work well, gauged by the “delirium” experiences and stories that emerged, from patients, care-givers, relatives, and staff. Connecting patient experience with the research; a bridge to be further cultivated and explored.

Lastly, Grounded Theory is a relevant methodology in Delirium KT. Developing the strong connection of the main concern and how this main concern is being resolved²⁶ from within the field of inquiry has increased the relevance and buy-in of the initiative and of developing subsequent knowledge transfer initiatives.

KT must take into consideration the relationships, the connections, and how these connections unfold over the course of the KT process. The KT stream, where obstructions and rough water are encountered, must be reflected in the responsiveness of the KT. Where we start out on the KT stream and where we end up aren’t necessarily always as planned. It’s good to have a map to navigate the KT stream and to cultivate the relationships along this stream.

About the Author

Dr. Paul Wishart is an adjunct assistant professor in the Department of Surgery, Faculty of Medicine, at the University of Calgary. He is also a marriage commissioner and a celebrant. Paul has a Ph.D. in molecular biology and post-doctoral training in molecular endocrinology, and has complemented his science background with an M.A. in Pastoral Psychology and Counseling, an internship in Marriage and Family Therapy, and a residency in Spiritual Care. Paul’s current research interests and expertise lie in the areas of Grounded Theory, delirium, and knowledge transfer.

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Core Competency: Back to the Basics

Katherine Chubbs and Kimberley Miller

Abstract

The "30 Day – 100% Challenge" was an initiative of a former Regional Health Authority to promote best practices in Infection Prevention and Control (IPC) across a broad rural area. The challenge utilized educational techniques such as virtual learning, a mobile computer lab, and a good-natured sense of local competition to achieve a 30 day – 100% participation rate among the 400 healthcare workers in the target area. Post-testing completed one year after the program revealed a 90% retention of the core competencies. The authors conclude that their initiative provides an example of just one successful strategy among many. However, the methods used in this case can be used to support the delivery of KT activities in a variety of settings, while supporting team growth and enhancing participant buy-in.

Background

New directions in healthcare related to Infection Prevention and Control (IPC) stimulated a renewed effort to ensure that effective IPC practices were in place across one former Alberta Regional Health Authority. Specifically, the documents "Provincial Review of Infection Prevention and Control," "2009 IPC Accreditation Standards," and the "Alberta Hand Hygiene Strategy" were influential in the evolution of a comprehensive organizational hand hygiene strategy, setting the standards by which any effective IPC program would be measured.

KT Initiative

Development of the innovative 30 Day – 100% Challenge proved to be a highly effective method for teaching those involved in the delivery of healthcare the importance and current best practice of IPC core competencies. In addition, it revealed hidden benefits only possible through the support and dedication of leaders and learners to its cause. This initiative contributed to increased awareness of best practice in IPC, as well as facilitating a change in practice.

Audience

One of Alberta's former nine health regions covered a large geographical area and employed thousands of staff. The former region included numerous healthcare centers and community health service offices, providing a combination of acute care, continuing care, and community based services. The target learner population for the core competency training was all staff, physicians, emergency medical personnel, and volunteers working at these sites.

KT Strategy

The IPC staff embarked on a mission to educate 100% of staff, physicians, emergency medical personnel, and volunteers in proper hand hygiene, routine practices, and chain of transmission. The planning considered both the advantages and the challenges within the organization in order to ensure an efficient and effective education program.

Partner involvement: Collaboration can help improve the health of communities;¹ therefore, previously established collaborative relationships with partners, such as physicians and volunteer groups, were utilized to endorse the selected approach to the delivery of IPC education.

Strong leadership: Building a strong IPC program requires leadership support.² This support was evident in the management team's commitment to supporting the requirements set forth for the regional IPC Program. This commitment facilitated acceptance by staff to both participate in and benefit from the experience.

Infrastructure: A system that could support mass education and evaluation provided the foundation for the IPC Core Competency education program. The rollout provided an enriched environment through which to test the system, as the learner group was diverse and inclusive. With the assistance of a mobile computer lab, the team was well prepared with the tools required to roll out computer-based education programming.

Vast geography: The challenges of covering a vast geography were very familiar to the employees of the Regional Health Authority. The plan included consolidation of Learning and Professional Development (LPD) and IPC resources to provide an initial face-to-face rollout of education supported by the use of online distance education resources of the same subject matter.

Limited resources to lead implementation: The Regional Health Authority IPC structure included a core team of IPC staff; however, it was vital to expand the resource base for education delivery to more than just those professionals. Working in pairs, staff from both IPC and LPD facilitated the education delivery to 100% of the learners during the rollout. Remote support was provided to managers who were instituting this education either with new staff or with those unable to attend the face-to-face education sessions.

Unique learner needs: Learning is unique to each individual; each person learns at their own pace and in their own way.³ The education rollout team was tasked with designing a learning plan that would meet the individual needs of everyone in the learner population. The instructional design was deliberate in promoting learning that was relevant to each learner, addressing their various learning styles in order to guide and apply what they learned.⁴



Instruction: The 30 – Day 100% Challenge

Establishing the content for instruction was especially crucial in this education plan as the content was aimed at meeting mandatory requirements as well as intended to educate 100% of the employee, provider, and volunteer populations responsible for patient care. For this project, hand hygiene, routine practices, and chain of transmission were identified as the major IPC core competencies.

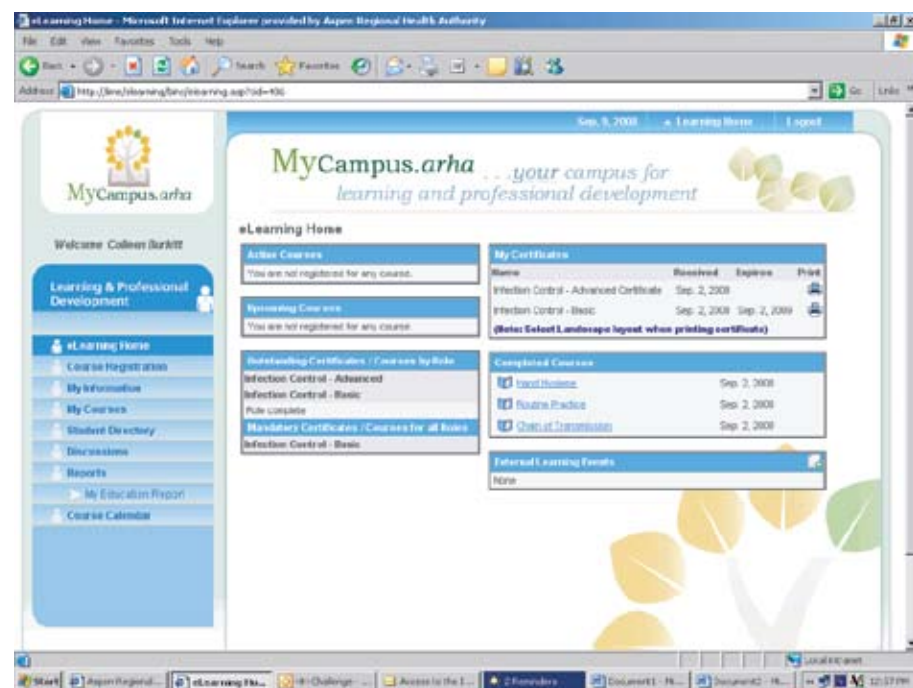
Hand hygiene remains the primary measure of reducing healthcare-associated infection and the spread of antimicrobial resistant organisms to enhance patient safety across all settings.⁵ The hand hygiene module included a practical as well as a theoretical component. Learners demonstrated proper hand hygiene practice using alcohol based hand rub.

Routine practices are the foundation of IPC. They are used in the routine care of all patients at all times in all healthcare settings and, emphasize the importance of hand washing, glove use, face protection, and gowns ("BC Pandemic", 2009). Use of routine precautions prevents transmission within health care settings that may cause illness or infection in patients. Simultaneously, it reduces risk of HCW exposure to blood borne pathogens and other infectious pathogens.⁶

One of the basic principles of Infection Prevention and Control is the chain of transmission.⁷ There are six links in the chain of transmission. Understanding the characteristics of each link provides the healthcare worker with knowledge of how to support vulnerable patients as well as how to self-protect.⁸ This understanding promotes application of the knowledge acquired in the first two modules.

A virtual learning and content management system was designed to support online learning region-wide for the RHA (see Figure 1). Through use of MyCampus, facilitators were able to support learning by multiple health care providers simultaneously. In addition to its use for the face-to-face support from the facilitators, MyCampus also became the format to sustain ongoing IPC core competency education into the future.

Figure 1: MyCampus.



Implementation

The pilot site: The 30 Day – 100% Challenge was piloted in a rural community consisting of approximately 400 learners. A mobile computer lab was set up onsite and supported by the two project leads. The goal was to facilitate training for as many individuals as possible during the first five days of the 30 Day – 100% Challenge.

Motivating the learners became an important objective as the launch date drew nearer. While the managers were committed to scheduling and supporting 100% employee participation, it was vital that participants share the manager's enthusiasm and commitment to achieving the goal. Group vs. group challenges were created as discipline- or department-specific groups challenged each other to see who could complete the learning modules first.

Within the first week of the pilot, the majority of the learners completed the required education modules. Over the following weeks, and up to 30 days post-implementation, 100% of the learner population received the core competency education. The next challenge was to keep the momentum going as the team moved across the region.

Completing the challenge: The spirit of competition continued as site vs. site and community vs. community challenges were established. Over the next several months, using a format modelled after the pilot site, all learners received the core competency training. Since the pilot, as new staff and partners are welcomed to the organization, opportunities to receive the education are presented either through scheduled computer-lab based sessions or independently using MyCampus.

Results

Pre- and post-tests were included in the program design, allowing an opportunity to complete an immediate evaluation of learning as well as evaluation related to knowledge retention. Pre-testing of the pilot site revealed a 78% understanding of the theoretical component of the education program. Post-testing, completed one year after the education delivery, revealed 90% retention in understanding of the theoretical component of the program (see Table 1). Evaluation of practical application

Table 1: One year post-test – IPC Core Competency.

**Learning & Professional Development and Infection Prevention & Control
Hand Hygiene Post - Quiz 2009**

Q#	site 1		site 2		site 3		site 4		site 5		site 6		site 7		site 8	
	P	O	P	O	P	O	P	O	P	O	P	O	P	O	P	O
1	22	2	68	2	60	0	61	0	73	2	68	1	32	0	97	4
2	21	3	61	9	47	4	42	19	41	34	44	25	22	10	48	53
3	22	2	63	7	60	2	52	9	58	17	57	12	29	3	90	11
4	16	8	60	10	48	2	38	23	60	15	56	13	27	6	76	25
5	22	2	54	16	52	1	55	6	69	6	60	9	32	0	84	17
6	23	1	67	3	45	3	54	7	62	13	54	15	27	5	85	16
7	23	1	70	0	63	0	59	2	74	1	69	0	32	0	99	2
8	24	0	70	0	63	0	61	0	74	1	68	1	32	0	101	0
9	23	1	70	0	63	0	57	4	74	1	65	4	32	0	101	0
10	24	0	70	0	63	1	58	3	68	7	67	2	31	1	101	1
# Learn	24		70		63		61		75		69		32		101	
Average	92%		93%		90%		88%		87%		88%		93%		87%	

Core Competency: Back to the Basics

The 30 Day – 100% Challenge achieved both expected and unexpected positive results. The expected outcomes included an enjoyable and successful education experience using MyCampus to acquire new and updated knowledge. This instilled a desire within the adult learners to seek additional e-learning training and experience. The pilot demonstrated that MyCampus is a useful knowledge translation tool for a health care setting; thus, the system was utilized to deliver and track other education.

As an unforeseen positive outcome, this learning experience provided a basis through which to establish or strengthen relationships between employees, physicians, volunteers, and other providers. Additionally, the desire to transfer knowledge began to spread. Those who took the course first, felt empowered to mentor other learners who had initially been hesitant to embrace this new form of learning. This resulted in a boost of confidence and enhanced teamwork amongst all of the learners, especially those individuals who had never had the opportunity to learn online before.

Key Messages

This initiative provides an example of one successful strategy for delivering IPC education. The methods described can be used to support delivery of knowledge translation activities for teams in a variety of settings. Throughout the delivery of the core competency education program, positive leader and student motivation was maintained, resulting in much more than knowledge acquisition. Knowledge translation initiatives, such as the 30 Day – 100% Challenge, can support team growth and development and may lead to an enhanced desire to continue learning. Strong leadership and adequate support is fundamental to success in knowledge translation.

About the Authors

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Kimberly Miller, a Medical Laboratory Technology graduate of the Northern Alberta Institute of Technology, advanced into the field of Infection Prevention and Control in 1995, completing the ICP 1 Program from Centennial College in Toronto, Ontario. She then earned the Healthcare Administration Certificate, specializing in Infection Prevention and Control, from the University of Saskatchewan. Currently Kimberly is an infection control professional practicing across the full continuum of care with Alberta Health Services.

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Evaluation of Practice-Based Evidence in Nutrition (PEN)

Jayne Thirsk, Lynda Corby, and Daphne Lordy

Abstract

Practice-Based Evidence in Nutrition (PEN) was created by Dietitians of Canada as an innovative web-based decision-support tool that provides timely, evidence-based research to dietitians working in all areas of practice. Dietitians of Canada developed and implemented an evaluation framework to determine (1) the effectiveness of PEN for incorporating new knowledge into dietetic practice, and (2) the barriers and facilitators that dietitians experience in incorporating PEN into practice. Although in the early stage of the project, practitioners experienced barriers such as technology issues, cost, ease of access, and research gaps, the use of PEN has remained high across the two-year period of the evaluation. The authors conclude that success factors for mobilizing decision-support tools are that they be practitioner-centric, utilize an integrated KT approach, and include orientation and ongoing support services.

Background

Dietitians of Canada (DC), the national association of Canadian dietitians, provides leadership and support to its members in the application of relevant evidence to advance health through expertise in food and nutrition. Dietitians have embraced the call to inform their practice by use of evidence. Like other professionals, they too are challenged to find, sort, appraise, and assimilate the vast quantity of health information produced daily. In a needs assessment conducted by DC with its membership to identify priority services, assistance in synthesizing and translating the research that informs practice decisions was one of the most frequent requests. To address this need, DC collaborated with leading experts in evidence-based medicine principles, knowledge translation and transfer (KTT), technology, and dietetic practice, to develop and implement an innovative online decision-support service for dietitians called Practice-Based Evidence in Nutrition (PEN). Launched in the fall 2005, PEN is a dynamic service providing timely, evidence-based research to dietitians working in all areas of practice—public health, clinical, education and industry.

KT Initiative and Evaluation

The ultimate goals of the PEN service are to improve health outcomes of the public and to position dietitians as leaders in evidence-based practice. To assess the impact of the PEN service on practice and to determine what elements of PEN should be modified to enhance its usefulness as a KTT tool, DC undertook a two-phase evaluation with funding support from the Canadian Council on Learning. The PEN evaluation was guided by a logic model, describing short- and longer-term outcomes, indicators, and data sources. DC collaborated with the Department of Applied Human Nutrition, Mount Saint Vincent University (MSVU), for the development of evaluation instruments and their application for data collection, analysis, and synthesis. Two research questions were addressed:

1. How effective is the PEN service as a KTT tool for incorporating new knowledge into dietetic practice?
2. What are the facilitators and barriers that enable or prevent dietitians from using PEN to change the way they practice?

This research received ethical approval from the MSVU Research Ethics Board.

Methodology

A mixed methodology was employed which gave researchers the opportunity to more fully explore and understand the effectiveness of PEN as a KTT tool and its impact on, and value to, dietetic practice.

Quantitative data, including demographics, quality assurance, and impact information was collected using a face and content validated pilot tested web-based evaluation questionnaire, the PEN Evaluation Questionnaire (PEQ).

Questionnaire construction and analysis was informed by the PEN Logic Model and two theoretical frameworks—Pathman's Awareness-to-Adherence Model and Rogers' Diffusion of Innovations Theory, which were used to explain KTT and adoption of the innovation.^{1,2} The PEQ consisted of 46 questions and 11 sections; each question in the survey was linked with one or more elements of the theoretical frameworks, as well as the outcomes identified in the Logic Model in order to interpret the results.

An interview guide the PEN Evaluation Interview Guide (PEIG) was used to guide interviews with focus group participants concerning the effectiveness of PEN as a KTT tool and its impact on, and value to, dietetic practice. A modified three-round Delphi technique, utilizing seven experts in evaluation and KTT, was used to design the PEIG, which consisted of 18 questions divided into seven categories.³ The Pathman's Awareness-to-Adherence Model and Rogers' Diffusion of Innovations Theory also informed this process.

Website metrics, such as visitors and data on the number of content contributors and partnerships, were also collected.

Audience

DC sought systematic feedback from both early adopters of PEN and those who chose not to utilize the service. The PEQ was administered in the fall of 2007 (baseline) and 2008 (second wave). Participants were randomly selected from the DC membership list; additionally all PEN subscribers were invited to participate in the survey. The following table summarizes the population sampled.

Three hundred and ninety-nine PEN subscribers (30.6% response rate) and 133 nonsubscribers (11% response rate) participated in the 2007 survey. A smaller response rate was obtained in wave 2 (2008) with 265 subscribers (13.5% response rate) and 68 nonsubscribers (4.4% response rate).

Participants identified the following facilitators of and barriers to PEN use:

Facilitators

- ease of accessibility and use
- well organized
- current
- supports dietitians to be evidence-based practitioners
- trustworthy
- synthesis of large amounts of information into useable practice guidance statements
- dietetics/nutrition focus
- valuable to practice

Changing Practice (Yes we Can)

Barriers

- lack of or inconsistent findings in some areas of nutrition research
- while PEN content is viewed as credible by survey respondents, some challenged the role of students in creating content, as potentially diminishing the quality
- PEN'S subscription fee
- lack of equitable content in all areas of dietetic practice. Public health and foodservice or administration are less developed than the clinical areas, and that may limit its usefulness to some practitioners.
- printing issues associated with client handouts

KT Strategy

Dietitians have been involved directly in identifying and prioritizing knowledge needs, generating knowledge, and evaluating outcomes by participating in the ongoing monitoring of PEN and the research to evaluate its value to the profession. Additional examples or measures of engagement include:

Audience Engagement

- conceptualized, developed, implemented, and promoted by dietitians
- practitioner centred with Q&A format based on actual practice dilemmas submitted by users
- extensive communication plan, including regular user emails detailing new features, growing content, and new applications of PEN evidence; presentations at regional, national, and international events; invited articles in national evidence-based newsletters; focused communications to key decision makers and influencers of policy

Collaboration

- engaging over 450 dietitians and other health professionals as authors or reviewers
- using PEN as the foundational database for answering consumer calls (> 90%) by three provincial dietitian call centres
- ministries of Health engaging PEN-supported call centres in health strategy implementation (e.g., trans fat, obesity)
- leveraging content development activities with other KT organizations
- integrating PEN into nine university curriculums and internship programs
- engaging > 1/2 of DC's 23 practice networks in content development and stewardship

Capacity building

- evidence-based Decision Making online tutorial (in collaboration with Centre for Health Evidence) enhancing critical appraisal skills of dietitians and preparing reviewers to contribute to PEN. Since 2006, 999 dietitians have registered in this course
- Canadian Foundation for Dietetic Research supporting knowledge pathway development to enhance quantitative and qualitative research skills
- telephone and web-based PEN orientations enhancing user experience and success
- writer's guide and explicit review forms guiding authors and reviewers in the PEN approach to finding, appraising, and applying evidence to practice
- PEN supporting professional development in addition to addressing immediate practice questions
- integrating evidence-based client tools and professional resources
- student mentoring to prepare PEN content through university courses and internship programs

Results

The effectiveness of PEN as a KTT tool was measured through the evaluation research and monitoring of specific indicators:

Adoption or frequency of use

- In 2008, 10% of respondents reported using PEN daily (up from 4% in 2007). Most (67% to 71%) used PEN between weekly and monthly.
- Visits to PEN demonstrate growth in usage: 29,000 visits per month in 2005, 65,000 in 2008, and in 2010, the number exceeds 110,000 visits per month.

Quality of content (currency, completeness and detail)

- Confidence in the currency of PEN content remained high in both survey years: 91% in 2008 and 94% in 2007. The breadth of knowledge pathways (topics) continued to expand.

Year	Knowledge Pathways
2005	12
2006	36
2007	78
2008	108
2009	140
2010	155

- 74% (2007) and 78% (2008) strongly agreed or agreed that PEN provided a satisfactory answer to their questions
- 77% (2007) and 78% (2008) felt that PEN provided sufficient detail to guide practice

Credibility

- 94% of respondents in both survey years responded that PEN enhanced their credibility by promoting evidence-based practice.
- 89% strongly agreed or agreed that PEN was a valuable tool for their practice.

Availability and use of practical tools and resources for clients

All tools are evaluated against the evidence in PEN, and only those that meet those criteria are included. Commonly used client tools were culturally adapted and translated into other languages, extending PEN's evidence broadly with clients.

Survey results found that 48% of participants shared the PEN tools/resources daily, once per week, or once per month, with clients and/or colleagues. Sharing occurred more often by users who reported they received a satisfactory answer to their practice questions and agreed that PEN enabled them to take an evidence-based approach to their practice. Respondents wanted more consumer/client handouts in low literacy (12%) and advanced (10%) formats.

Perceived benefits to client health outcomes

Perceived impact on client outcomes based on application of PEN guidance increased to 61% in 2008 from 55% in 2007.



The Global Resource for Nutrition Practice

Key Messages

Numerous lessons can be gleaned from the implementation and evaluation of PEN that have relevance to other KT initiatives.

- Engagement of the profession in planning, developing and implementing PEN promotes uptake.
- User perception of and success in using PEN is enhanced through orientations.
- Student engagement and university endorsement are key factors for sustainable uptake.
- Expanding content of the database in response to expressed needs promotes its use.
- Collaborative partnerships with call centres, provincial ministries of health, other KT initiatives, and international dietetic associations build credibility and support sustainability.
- Online tutorials build capacity for critical appraisal and foster a greater understanding of evidence-based decision-making amongst users.
- Sustainability of the service is enhanced through multiple revenue streams (subscriptions, grant funding, licensing of content, partnerships).
- Use of both a contract writer and a volunteer development model are effective. This addresses requirements for quickly enhancing the database and for being responsive to practitioner questions needs, while developing knowledge and skills in critical appraisal among the membership, and fostering commitment and pride in the professional database.
- Additional research is required to measure the impact of PEN on health outcomes.

About the Authors

Lynda Corby, M.Sc., M.Ed., R.D., F.D.C., and Dr. Jayne Thirsk, Ph.D., R.D., F.D.C., are employed by Dietitians of Canada (DC), and were responsible for the conceptualization, implementation, ongoing management and evaluation of DC's Practice-based Evidence in Nutrition (PEN) service. Daphne Lordly, M.A.H.E., P.dt., Associate Professor, is Chair of the Department of Applied Human Nutrition at Mount St. Vincent University. She supervised three students who contributed elements to the evaluation of PEN as part of their graduate training.

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Tobacco Reduction and Cessation Program in a Rehabilitation Setting

Sue Yi-Austin, Hubert Kammerer, Grace Maier, and Isabel Henderson

Abstract

Tobacco use is the leading preventable cause of death and disability in Alberta, but hospitalization may offer a teachable moment for intervention with tobacco users. In February 2010 the Glenrose Rehabilitation Hospital's (GRH) Adult and Specialized Geriatric inpatient units implemented a Tobacco Reduction and Cessation Program. Based upon a model developed by the University of Ottawa Heart Institute, the program uses clinical practice guidelines to identify and offer treatment to all admitted tobacco users. In the first eight months of the program, training was provided to 300 GRH staff, with 30 of those receiving additional advanced training. Since implementation, 54% of identified tobacco users have participated in the multifaceted cessation program. The authors conclude that implementing a successful program in a rehabilitation setting requires the education and engagement of staff and physicians, as well as the support of senior administration and management.

Background

Tobacco use/smoking is the leading preventable cause of death and disability in Alberta and Canada, and is a major risk factor for chronic diseases such as heart disease, stroke, cancer, and respiratory illness. Quitting can immediately and dramatically reduce the risk of disease and the need for re-hospitalization.

Tobacco use/smoking can exacerbate and/or complicate a patient's hospital stay and has also been identified as a barrier to discharge, which has resulted in prolonged hospital stays while waiting for suitable placement in a facility that permits smoking.

"Smoking cessation is the only prevention activity that can be expected to save money, with the reductions in costs of events more than offsetting the cost of the smoking cessation programs."¹

KT Initiative

Until recently, most tobacco users/smokers would leave the hospital without receiving assistance for nicotine withdrawal or talking to a health professional about quitting. Simple, systematic changes in the way we care for hospitalized tobacco users/smokers can help more patients quit tobacco use/smoking and improve the overall health of our communities.

The rehabilitation hospital setting presents a unique opportunity to initiate tobacco cessation treatment. Smoke-free hospital policies require short-term abstinence from tobacco; and as rehab patients have a longer hospital stay than the average acute care patient, this will help to support tobacco cessation efforts. With trust and respect from patients, health professionals are well equipped to offer best practice treatment for tobacco addiction, including counseling and pharmacotherapy, which can double or triple rates of cessation over the long term.²

KT Strategy

The Glenrose Rehabilitation Hospital has adopted/adapted a model developed by the University of Ottawa Heart Institute—The Ottawa Model for Smoking Cessation. The goals of the GRH's program are to identify and offer treatment to every admitted tobacco user/smoker using clinical practice guidelines. The program includes three main components:

1. Identify tobacco users/smokers on admission.
2. Provide cessation advice and pharmacotherapy.
3. Provide follow-up support after discharge.

All inpatients in Adult Rehabilitation and Specialized Geriatrics are asked upon admission whether or not they use tobacco products (cigarettes, cigars, chewing tobacco, etc). If they answer “yes” they are then informed of, and given the option to participate in, the Glenrose Tobacco Reduction and Cessation Program which includes:

- written information
- education and/or
- nicotine replacement therapy (NRT)
- individualized counseling

With the patient's consent, they can be referred to community resources upon discharge if they wish to continue with their efforts to quit.

Stakeholder Engagement

With the full support of GRH administration, a multi-disciplinary Tobacco Reduction and Cessation Steering Committee was formed. This committee consists of:

- senior administration
- physicians
- nursing
- allied health professionals
- pharmacy

Key stakeholders include:

Nursing:

- to identify tobacco users on admission and to initiate Assessment/Treatment Form
- to monitor symptoms and compliance
- to support and facilitate the process

Physicians:

- to identify tobacco users on admission
- to prescribe medications and nicotine replacement therapy (NRT)
- to support and monitor the patient's progress

Interdisciplinary Team:

- includes physiotherapy, occupational therapy, recreation therapy, social work, care coordinators, pharmacy and respiratory therapy working together to support and encourage the patient through the process

External Stakeholders:

- Addictions and Mental Health, Alberta Health Services
- Primary Care Division – Community Health Services, Alberta Health Services
- Tobacco Reductions Unit, Alberta Health Services

Capacity Building

It was recognized that education of staff and physicians is key to the success and sustainability of a tobacco reduction and cessation program. It is critical that those who work most closely with patients can speak about the benefits to the patient's health and recovery in rehabilitation.

To date, over 300 staff and physicians have received education/training on how better to approach tobacco-using patients:

- nurses
- physicians
- social workers
- care coordinators
- allied health care professionals – occupational therapy, physical therapy, respiratory therapy, recreation therapy and dietary

A Pre-Implementation survey was deployed at the beginning of the implementation (February 2010) to gauge the knowledge base of the staff. One hundred seventy-three staff members participated in the survey with the following results:

- 85% indicated that they ask patients about their tobacco use
- 40% are confident in dealing with patients who use tobacco
- 32% are confident in explaining cessation NRTs/medications
- 63% feel a cessation program is very important

A post-implementation survey will be conducted in October 2010.

To support ongoing tobacco education efforts, the Glenrose is also accessing the Alberta Health Services Addictions and Mental Health's Tobacco Reduction and Cessation (TRaC) Training. These sessions cover topics such as nicotine replacement therapies and psychotherapeutic support, including motivational enhancement therapy and cognitive behavioural therapy. Case studies are examined and discussed. Staff members have shown a keen interest in learning more about tobacco addiction and how they can help patients reduce/quit their tobacco habit. More than 30 staff members have taken this additional training. The TRaC training, combined with on-site education sessions, equip staff with enhanced confidence in their approach to help patients reduce and/or quit. As a result they are seen as leaders in their units/programs, as they have the knowledge and the comfort level to address the issues associated with tobacco use.

Results

To ensure program education and sustainability, the tobacco cessation program has been incorporated into GRH's nursing orientation and mandatory education (April 12, 2010).

Since implementation of the Glenrose Rehabilitation Hospital's Tobacco Reduction and Cessation Program in February 2010:

- 67 of 124 identified patients who smoke/use tobacco products have participated in the cessation program (54% participation)
- more than 300 GRH employees have been educated and trained to provide support to patients who smoke/use tobacco products
- more than 30 GRH employees have received additional education through TRaC training

Although the cessation program was intended for patients, members of the Glenrose staff have accessed the program for information. Those who have experienced the challenge of quitting smoking are the best advocates to encourage others.

Key Messages

Education of staff and physicians is key to the success and sustainability of a tobacco reduction and cessation program. It is critical that those who work most closely with patients can speak in a knowledgeable and non-judgmental manner about the benefits to the patient's health and recovery in rehabilitation.

The support of senior administration and management is vital to the front line staff's commitment to implementing/utilizing the program. With consistent positive reminders, coupled with ongoing education sessions, the tobacco cessation program and its processes will become standard practice.

Being admitted to hospital has also been shown to increase a patient's motivation to stop smoking. Hospitalization may offer a teachable moment for intervention with tobacco users/smokers. Their health concerns can help them recognize that they are vulnerable to tobacco-use/smoking-related illnesses. At the same time, the supportive, smoke-free environment can support their attempt, to quit.

About the Authors

Situated on 13.8 acres in downtown Edmonton, the Glenrose Rehabilitation Hospital is the largest freestanding comprehensive tertiary rehabilitation center in Canada and offers services to children and adults on an inpatient, outpatient, day hospital, and outreach basis. Opened in 1964, the 244-bed facility has developed an international reputation for excellence in key areas of complex rehabilitation and specialized geriatrics. Isabel Henderson is Vice President of the Glenrose Rehabilitation Hospital (GRH), Alberta Health Services. Hubert Kammerer M.D., C.C.F.P., F.C.F.P., is a physician with Specialized Geriatrics, GRH. Dr. Kammerer serves as the physician lead on the GRH Tobacco Reduction and Cessation Program. Grace Maier is the director of Specialized Geriatrics, Glenrose Rehabilitation Hospital, and serves as the Chair of the GRH Tobacco Reduction and Cessation Program. Sue Yi-Austin, B.A., is the coordinator of the GRH Tobacco Reduction and Cessation Program.

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