Thinking Ecologically for Safer Healthcare: A Summer Research Student Partnership

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Abstract

As leaders for nursing education, nursing research, healthcare administration and patient safety, we asked one another: How do we use our collective resources to build health system capacity for clinically based research training and safer healthcare? Drawing on knowledge from the field of ecological restoration, which is the study and repair of damaged ecosystems, we partnered the Safer Systems research program of the Faculty of Nursing, University of Alberta, with Capital Health's Royal Alexandra Hospital (RAH), the Caritas Health Group, the Canadian Patient Safety Institute (CPSI) and several funding agencies to provide hands-on training in clinical research, infection control and patient safety policy development for nursing students during the summer months. As we plan ahead, our student and staff evaluations show that together, we can make concrete, vital contributions to student education, nursing research, evidence-informed practice, clinical quality improvement and national policy. We are using what we have learned to continually expand the range of undergraduate, graduate and post-doctoral clinical learning opportunities in healthcare safety that are available year round. Our shared goal is to support current and future nurses in leading the way for safer healthcare systems and the safest possible healthcare.

Wherever they work, visionary nurse leaders are striving to revitalize nursing education, research and practice in ways that generate sustainable improvements to practice environments and the outcomes of care (Lamb 2003; Green 2003). Deepening shortages in human resources, rising service demands and ongoing fiscal constraints call for creative strategies to meet our leadership mandates in academic research and education, high-quality health services and policy development for meaningful health systems change (Health Canada 2002; O'Brien-Pallas et al. 2005; CHSRF 2006). In Edmonton, Alberta, we developed the Safer Systems research program in 2002 to pursue these challenges with support from

the University of Alberta's Faculty of Nursing (see http://www.nursing.ualberta.ca/), Capital Health's Royal Alexandra Hospital (see http://www.capitalhealth.ca/) and several funding agencies (see http://www.nursing.ualberta.ca/SaferSystems/). Our nurse-led research teams use knowledge from the health sciences, healthcare ethics and ecological restoration to study and strengthen the organizational ethics and safety practices of today's healthcare environments. We work with like-minded students and colleagues in academia, policy and health services across Canada and internationally to generate adaptive management and progressive, evidence-informed whole-systems change (Edwards et al. 2003; Marck 2006; Edwards et al. 2007).

In early 2005, we decided to create safety-oriented training opportunities in research, knowledge translation and infection control practice by initiating a collaboration between our research program, University of Alberta nursing students, the Royal Alexandra Hospital Clinical Research Unit, the Canadian Patient Safety Institute (see http://www.patientsafetyinstitute.ca/index.html), our Infection Control Services and a variety of funding bodies. In this paper, we outline our work to build systems capacity for high-quality nursing education, clinical nursing research and safer healthcare. We hope our experience contributes to a growing network of nursing initiatives that continually expand undergraduate, graduate and post-doctoral learning opportunities in healthcare safety across Canada.

Thinking Ecologically: Building System Capacity for Evidence-Informed Care

Safer Systems initiatives are grounded in the belief that we can repair and strengthen today's healthcare environments at an affordable cost by augmenting our best "systems thinking" with "ecological thinking" or "thinking like" a complex, adaptive system (Gunderson et al. 2002; Marck 2004, 2005). At its simplest, good restoration is the ethics, science and practice of repairing eco systems that have been degraded, damaged or destroyed (Higgs 1999, 2003; Ali 2004; Society for Ecological Restoration 2004). In essence, we study and manage health systems issues that affect nursing by integrating knowledge from nursing and healthcare with research in human factors engineering, organizational learning, ecological restoration and other systems sciences (Marck et al. 2006). Our goal is to translate the principles and methods of good ecological restoration into nursing research that helps us build safe places and safer systems for practice communities and the people in their care.

A number of ecological concepts have been discussed in a variety of healthcare and patient safety publications (Donnelley 1999; Glouberman 2001; Ali 2004; Waldvogel 2004; Amalberti et al. 2005), with nurse investigators leading the way in socio-ecological approaches to fall prevention and other health systems improvement research (Edwards et al. 2003, 2004; Lockett et al. 2005). As the first research

program to apply the principles of good restoration to health systems problems, Safer Systems teams seek to contribute to this growing body of ecologically minded research. One key principle of sound restoration is ecological efficiency, which requires us to optimize the ways that we envision and use resources to build system capacity for healthy functioning and sustainability. This ecological principle does not require healthcare leaders to follow the re-engineering mantra of "doing more with less"; neither should eco-efficient initiatives be unnecessarily resource-intensive. Rather, we achieve ecological efficiency when we effectively link and develop our collective resources through practical, cost-conscious means.

In a nutshell, ecological thinking encourages educators, administrators, researchers, funding bodies and other parties to "think capacity" by networking human and other resources across the health system that are underutilized or suboptimally connected. In restoration work, eco-efficiency is commonly achieved when researchers engage students, policy makers and community members in integrated cycles of research, practice and adaptive learning. In healthcare, the lessons of good restoration may be ones that health systems leaders cannot afford to ignore. For instance, as the future professionals and leaders of our profession, nursing students are an invaluable resource of developing practitioners who can both learn about and advance nursing practice and research as they progress. We build eco-efficient health systems capacity for simultaneous education, research and practice, for example, when students learn about population health through developing and implementing a cancer screening program (Arbuthnot et al. 2007), take part in immunization programs or participate in research training programs. With this eco-efficient mindset in view, it was easy to identify one another as vital resources for creative collaboration.

Translating Eco-Efficiency into System Partners for Safer Healthcare: Our Journey

As a 700-bed teaching and referral hospital in the Capital Health region, the Royal Alexandra serves approximately 32,500 inpatients and 112,000 outpatients across Canada's Northwest every year. Just a few blocks away, the head office of the Canadian Patient Safety Institute (CPSI) was opened in 2004 as a national, arm's-length, not-for-profit corporation charged with promoting evidence-informed safety practices, fostering the development of safety cultures and sharing effective strategies for achieving safer healthcare. Five minutes away by rapid transit or a 20-minute walk across the river, our nursing faculty presently delivers education to over 1,500 undergraduate students, 287 master's and doctoral students and approximately 25 post-doctoral and visiting scholars each year. We share a commitment to creating clinical environments where nursing students, practitioners and leaders use research to improve practice and strengthen the quality and safety of care. It became self-evident to us that our students just needed some

resourceful collaboration with us to advance our shared educational, research and service goals.

When we put our heads together as partners, we borrowed freely from a successful model of research training for graduate students, post-doctoral fellows and mid-career faculty led by Canadian Health Services Research Foundation/Canadian Institutes of Health Research (CHSRF/CIHR) Nursing Chair Dr. Nancy Edwards (see http://aix1.uottawa.ca/~nedwards/english/internships.html) to set specific objectives for student learning, the conduct of clinical research and the translation of evidence into practice through quality improvement activities, publications and presentations and work with the CPSI on national safety initiatives. To achieve these objectives, our Infection Control Services offered a regular schedule of supervised hand-washing audit experiences; the CPSI collaborated with each student to identify suitable projects for their involvement; we worked with Dr. Janice Lander under the auspices of her CHSRF/CIHR Chair and other faculty researchers to provide weekly student research seminars, and we placed each student on one or more Safer Systems research teams.

With our plans in place, we established letters of agreement as partners and completed initial funding applications to three agencies, with positive outcomes on two counts. In May 2005, the first three summer research studentships were funded by the Health Quality Council of Alberta (HQCA) and by Dr. Lander's CHSRF/CIHR Chair for Better Care at the Faculty of Nursing, University of Alberta, and in the summer of 2006, the Chair for Better Care funded a further summer studentship. As HQCA and CHSRF are, respectively, provincial and national agencies that sponsor research and knowledge translation to improve the quality, safety and performance of the health system, we knew that we could make good use of their support to achieve our goals. Formal evaluations from students, faculty, and hospital and CPSI staff validated this conviction; and there is no better way to share our students' experiences than in their own words.

Research for Systems Change: Our Future Leaders Speak

A.D.: On the Safer Systems I TEAM project (Interdisciplinary Team for an Evidence-based Action-researched Model of Patient Care), I worked with the cardiology ward to pilot a model of patient care that incorporated participatory research, new documentation tools, expanded nursing roles, interdisciplinary team education and a report card to monitor patient satisfaction, staff perceptions of professional practice and organizational performance. As I delivered and collected surveys, I interacted with patients and practitioners and gained an appreciation of the challenges to researching complex organizational change in a busy clinical setting. Above all, I saw that involving front-line staff in research allows you to obtain constructive feedback

and adapt research to the particular clinical environment and culture. At the CPSI, I helped chart the timelines for the Safer Healthcare Now! campaign activities, worked on the campaign charter and learned about safety interventions to prevent unnecessary complications like surgical site infections and ventilator-associated pneumonia in the acute care setting.

T.D.: During my studentship, I worked on a Safer Systems safety culture project with employees and physicians in the Caritas Health Group to conduct data entry and analysis of completed surveys on perceptions of the organization's safety cultures by staff, managers and physicians. The research findings were subsequently presented to both the Caritas Health Group Executive and the Capital Health Executive teams to support their ongoing efforts to strengthen safety culture across the region. At the CPSI, I helped draft the Communication and Promotion Strategy for the Canadian Root Cause Analysis (RCA) Framework, conducting literature searches and preparing presentations to disseminate the framework to health systems managers and staff. Besides learning about RCA, I realized how important it is to engage the target audience in any patient safety strategy you are trying to promote. Throughout my experience with the Safer Systems research program and CPSI, I could see the importance of healthcare professionals' participation in clinical research. For example, I learned first-hand how practitioners perceived safety culture on their units and within their organizations and how they believe that patient care can be improved.

J.N.: When I began my studentship, I worked on a project funded by the Canadian Nurses' Foundation (CNF), where we used practitioners' knowledge of their hospital and principles of ecological restoration to design, pilot and evaluate a Medication Safety Checklist (Marck et al. 2006). I made posters, reviewed "near misses" on the pilot unit and conducted literature searches. As we completed the CNF project, I helped the team write a grant application for further photographic research on medication safety with practising nurses. This research, funded by the Social Sciences and Humanities Research Council (SSHRC), is now underway (see http://www.researchandrestoration.ualberta.ca). In a quality improvement project with Infection Control, I helped develop the evaluation tool for the Royal Alexandra Hospital hand-washing station test site and monitored the use of the station to determine potential improvements that could be made. At the CPSI, I assisted with an environmental scan of the patient safety alert mechanisms around the world to obtain information for the potential development of a Canadian patient safety alert mechanism. Through this project, I gained a great deal of knowledge about all the different places that patients and medical staff can go to report adverse drug events or to learn about drug or medical equipment recalls.

N.J.: During my studentship, I conducted hand-washing audits, helped with the CPSI Safer Healthcare Now! campaign evaluation and administered post-implementation surveys for the I TEAM project. By taking part in clinical research, I saw staff and managers work together to advance evidence-based practice even as they coped with heavy patient loads and difficult working conditions. For example, it was really impressive to see 18 staff members and physicians come on their own time to discuss the I TEAM's research findings with unit and senior hospital leaders. At the CPSI, I prepared a chart of the major milestones and timelines of the project and constructed a mapped representation of participants and partners enrolled in the campaign. I learned that systems change on a national scale requires constant communication among organizations and the grass roots, which has encouraged me to get involved in communication and input as a future practising nurse. Now as I enter nursing practice with an awareness of quality improvement measures, I know a lot of people who can help me make a difference. Perhaps most important of all, I feel empowered to advocate for patient safety through promoting hand-washing, understanding patient safety culture and participating in effective interdisciplinary research.

All: For all of us, being in a clinical research unit brought research and practice together in real, tangible ways that we have carried forward into the rest of our nursing programs and beyond. For example, in addition to working on Safer Systems research and CPSI initiatives, we worked with expert infection control practitioners to conduct hand-washing audits on patient care units, and three of us helped the Infection Control Services implement a hand-washing intervention as a provincial test site. As a result, we developed skills in purposive survey sampling, maintaining an audit database, report writing and making presentations to decision-makers and staff. We also learned that you can creatively combine ethics, research and quality improvement through such initiatives as a Safer Systems Ethics in Practice session on hand-washing for hospital staff (Woolsey et al. 2005) and the CPSI's hand-washing campaign, Patient Safety: It's in Your Hands (see http://www.patientsafetyweek.ca/photos.aspx). Needless to say, we will use the ethics and evidence of hand-washing and several other safety practices throughout our careers.

As we attended interdisciplinary research team meetings and regularly interacted with patients, families, staff and physicians, we gained a genuine appreciation for the complexities of conducting research and translating evidence into the provision of better care. In addition, we learned the importance of the ethics review process, participant confidentiality and non-coercive consent processes as we sought participation from patients and staff and discussed ethical issues within our research teams. We also learned how to collect, clean,

audit and analyze data with our research teams, and we prepared and delivered presentations on our work to a wide range of audiences. For instance, we presented to fellow summer students in weekly CHSRF/CIHR Chair for Better Care research seminars, shared our work with Canadian Patient Safety Institute staff and assisted with research reports for our health region, the Infection Control team and the I TEAM patient care unit. In addition, we helped with presentations for a Canadian Bioethics Society Conference, two Canadian Healthcare Safety Symposiums, an International Society for Quality in Health Care conference, the Health Sciences University of Hokkaido, Japan and faculty and hospital personnel at the Universidade de São Paulo, Ribeirão Preto, Brazil. It is exciting to see other people take interest in the research that we took part in, both at home and around the world. We hope our experiences will inspire other students to partner with faculty, clinical agencies, national institutions and funding bodies to realize their learning goals.

Sustaining Partnerships for Safer Care: Next Steps

Krull-Naraj (2006) asserts that effective nurse leaders must continually forge creative partnerships with other health systems colleagues to generate the cost savings we need to sustain the nursing profession and its vital contributions to health. We know she is right. Our summer research partnership allowed us to train several students in safety research, strengthen our research teams, augment scarce infection control staffing in a busy tertiary acute care setting, contribute to vital quality improvement activities, support several national safety initiatives and translate our learning for a wide range of local, national and international audiences.

We also know that the research, collaboration and leadership skills of participating students, faculty, practitioners and managers have grown significantly. Based on positive feedback from all parties, we conclude that clinical research partnerships make safety research knowledge come alive, and we know that similar partnerships are feasible across Canada and internationally to further our common goals. The next step is to use our partnership resourcefully to expand and grow.

Accordingly, we are now establishing further student initiatives at the undergraduate, graduate and post-doctoral levels that include offering Honors Undergraduate research training for academic credit during the year, recruiting graduate and post-doctoral trainees through our SSHRC grant and other funding, conducting other collaborative student work with the CPSI and accelerating plans for a collaborative academic–clinical learning unit at the RAH where several faculty researchers, students, clinical educators, practitioners and leaders can work together year round to study and strengthen the quality and safety of care. We have also initiated several academic–clinical exchanges with our Brazilian colleagues, and eventually, we would like to see students competing for academic–clinical research practi-

cums at the undergraduate, graduate and post-doctoral levels in all semesters. Needless to say, we will keep seeking funding relationships to support our growing work, and over time, we hope that we are one sustainable enterprise within a vast Canadian network of academic–clinical research units that are populated by similar comrades-in-arms. As Eric Higgs (2006) says, ecological restoration is not only meant to make things better; it is also meant to be fun. We agree. After all, what could be more fun than transforming collaborative learning into better care?

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