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I. Foreword

Patient safety has been defined as the "recognition and mitigation of unsafe acts within the health-care system and adoption of best practices shown to lead to optimal patient outcomes"[1]. Widespread attention to patient safety began approximately 10 years ago with the US Institute of Medicine's landmark report, *To Err is Human*. Synthesizing the results of two massive epidemiologic studies, this report famously concluded that 44,000 to 98,000 patients die each year in US hospitals from preventable complications of their medical care[2]. Comparable studies conducted in other countries indicate that from 3% to 13% of hospitalized patients suffer injuries from their medical care, rather than from their underlying diseases, and that 30-50% of these injuries are preventable.

The Canadian Adverse Events Study[3] (co-led by Professor Ross Baker from the University of Toronto) confirmed that these results apply to Canadian healthcare. Seven and a half percent of adults admitted to Canadian acute care hospitals in the year 2000 experienced at least one injury from their medical care and 36.9% of these events were probably preventable. Extrapolating from these findings, investigators concluded that, between 141,000 and 232,000 admissions to acute care hospitals in Canada resulted in adverse event (i.e., an injury from medical care), and that 9,000 to 24,000 deaths associated with these events could have been prevented.

The Canadian Adverse Events Study set in motion national and provincial initiatives aimed at improving patient safety and healthcare quality, mirroring similar activities in the US, Europe, and Australia. The Canadian Institutes for Health Research and the Canadian Patient Safety Institute have dedicated funding for Patient Safety research chairs and ongoing research competitions; the Royal College of Physicians and Surgeons of Canada now requires safety training in educational programs for core and subspecialty programs[4]; and numerous educational events occur nationwide on a regular basis.

Despite this widespread interest in patient safety, few Universities have developed centres or dedicated academic programs focused on patient safety. The University of Toronto recognized the opportunity to build on local expertise in the areas of patient safety and healthcare quality improvement by developing a Centre for Patient Safety in partnership with two of its affiliated hospitals, Sunnybrook Health Sciences Centre (SHSC) and the Hospital for Sick Children (SickKids). The idea was led and developed by many people, but particularly Dr. Robert Byrick, St. Michael's Hospital and the University Department of Anaesthesia, Dr. Ronald Laxer, Sick Kids Hospital and the University Department of Paediatrics, Dr. Wendy Levinson, Chair, University Department of Medicine (and, at the time, also the Physician-in-Chief at Sunnybrook Health Sciences Centre), Dr. Catharine Whiteside, Dean of the Faculty of Medicine, and the senior leadership of SickKids Hospital and Sunnybrook Health Sciences Centre, especially the two Chief Executive Officers, Ms. Mary Jo Haddad and Dr. Barry McLellan. Without the consistent advocacy and commitment of these individuals the Centre would not be in the position it is today.

[1] Canadian Patient Safety Dictionary http://rcpsc.medical.org/publications/PatientSafetyDictionary_e.pdf

[2] Kohn L, Corrigan J, Donaldson M, eds. To Err Is Human: Building a Safer Health System. Washington, D.C.: Institute of Medicine Committee on Quality of Health Care in America. National Academy Press; 2000.

[3] Baker GR, Norton PG, Flintoft V, et al. The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada. CMAJ 2004;170:1678-86.

[4] Royal College CANMEDS Criteria for postgraduate medical education

The University of Toronto Centre for Patient Safety

The Centre for Patient Safety will provide leadership in patient safety education complemented by research programs and collaborative networks within the Toronto Academic Health Science Network (TAHSN) and the broader healthcare system.

Recognizing that the science of patient safety involves not just traditional biomedical sciences and health services research but also other disciplines, including human factors engineering, cognitive psychology, complexity science and information technology, the educational and research activities of the Centre will draw on individuals and institutions in diverse disciplines and professions.

The Centre aims to improve patient outcomes by promoting education among a broad range of practitioners, developing interventions that reduce or mitigate patient safety problems, and promoting the translation of such knowledge into routine practice. This goal strongly aligns with academic, regulatory and governmental health system priorities provincially, nationally and internationally.

Vision

To establish the University of Toronto as a leader in patient safety research and education.

Mission

To create, disseminate, and implement new knowledge in the field of patient safety at the University of Toronto and its affiliated hospitals in order to provide the safest possible care for patients.

II. Director's Message

Kaveh G. Shojania, MD
Director

My appointment as inaugural Director of the Centre for Patient Safety began in January 2009. The work of the following 12 months has focused on hiring core personnel for the Centre, securing physical space and developing the vision and mission of the centre into concrete operational plans. These important activities have laid the foundation for major educational and research initiatives in the coming years.

We have successfully appointed four key faculty members with stellar reputations in the field of patient safety to provide the Centre with a robust senior leadership team. I am delighted with the appointments of Drs. Anne Matlow and Edward Etchells as Associate Directors representing the two lead hospitals for the Centre. Dr. Matlow has been a leader in patient safety and infection control at SickKids Hospital and currently leads a national study of patient safety in pediatric hospital care.

Dr. Etchells was the founding Director of the Patient Safety Service at Sunnybrook Health Sciences Centre and is currently the Medical Director of Information Services.

We also welcome Dr. Ross Baker as our Director of Graduate Studies and Dr. Chris Parshuram as the Director of Pediatric Patient Safety Research. Dr. Baker was the co-principal investigator on the Canadian Adverse Events Study and is an internationally recognized researcher in patient safety. Dr. Parshuram is a pediatric intensivist with expertise in critical care outreach, medication safety and preventing fatigue in healthcare workers. He served as the international member of the Institute of Medicine Committee on Optimizing Resident Duty Hours. Drs. Baker and Parshuram substantially enhance the scholarly capacity of the Centre and I am delighted they have joined our team. A more detailed description of the accomplishments of all four faculty members can be found in the Faculty Profiles section of this report.

Physical space for the Centre now exists both at the SHSC (on the 4th floor of the H-wing in the main hospital) and at SickKids The SickKids space (at 525 University Ave, on the same floor as their Learning Institute) is currently being renovated and we anticipate moving in by April 2010.

The involvement of all TAHSN hospitals and University Faculties represents a major priority for the Centre. Consistent with this goal, Drs. Matlow, Etchells and I have spent much of this year meeting with representatives of these stakeholder groups including senior leaders and researchers in Nursing, Pharmacy, Rehabilitation, Management and Engineering as well as executives and leaders in patient safety at TAHSN hospitals. We have also met with staff at the Ontario Ministry of Health and Long-term Care and the Ontario Hospitals Association.

The many meetings and interviews conducted with these stakeholders and patient safety researchers this past year have also helped build an inventory of activities related to patient safety across TAHSN and the University of Toronto community. One of the problems frequently encountered in patient safety is that people work in silos, both by discipline and institution. For instance, physicians, nurses, pharmacists tend to conduct research in parallel rather than in collaboration. Similarly, a hospital that implements a particular patient safety initiative often does so unaware of similar efforts at nearby hospitals, missing the opportunity to learn what did or did not work well with those experiences. Thus, I see a key role for the Centre as connecting individuals across institutional and disciplinary silos.

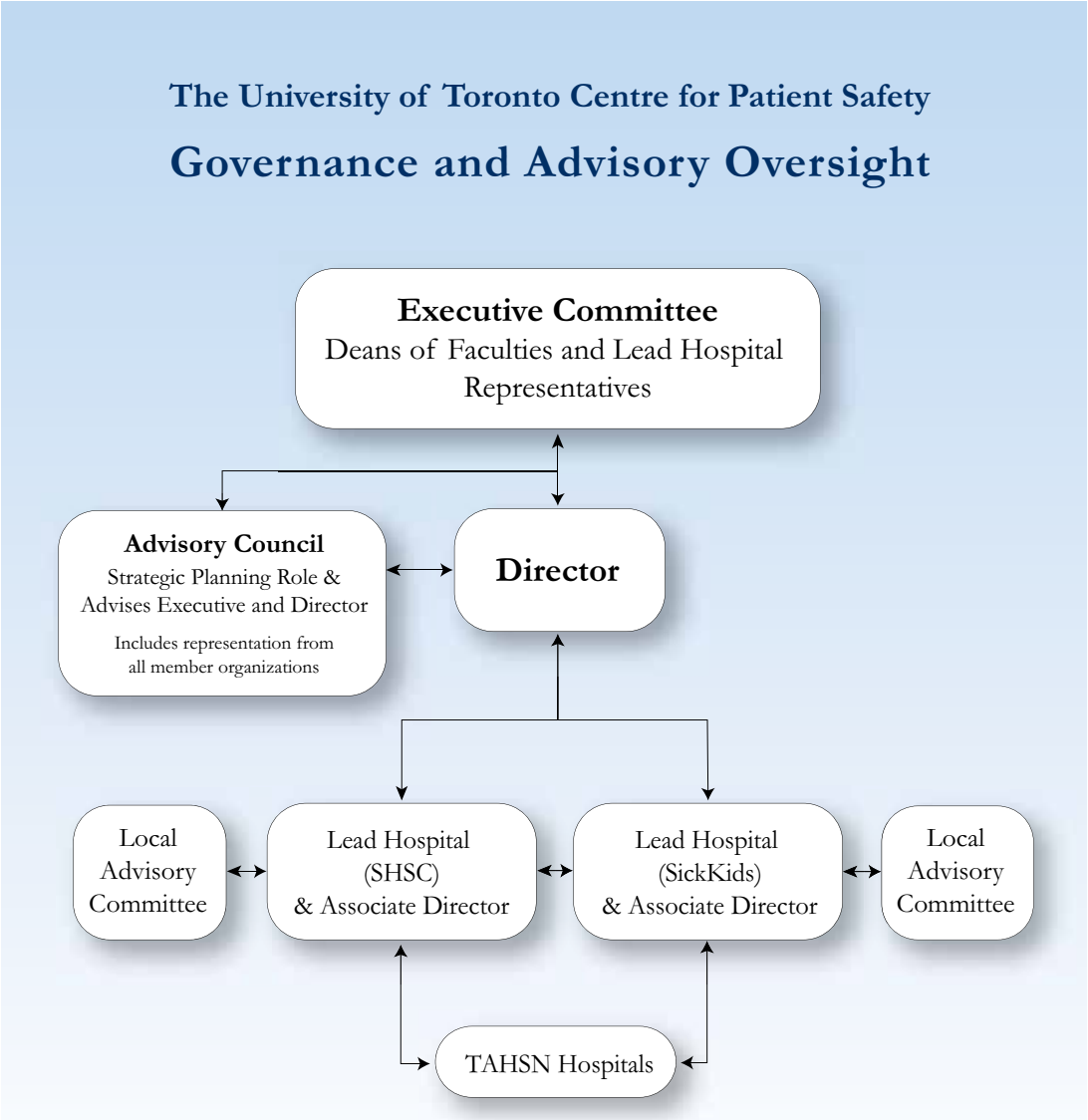
This connecting function of the Centre will provide value to individuals and institutions in the University of Toronto community in two ways. First, we plan to link individuals working on similar projects to learn from each other by sharing past experiences or to collaborate on future projects. Second, a number of groups in the University of Toronto community already have core expertise in areas related to patient safety - *the Centre for Global eHealth Innovation and Centre for Innovations in Complex Care (CICC) at the University Health Network, the Network of Excellence in Simulation for Clinical Teaching & Learning (NESCTL) at Mount Sinai Hospital, the Knowledge Translation Program at St. Michael's Hospital's Li Ka Shing Knowledge Institute, the new Centre for Inter-Professional Education at the Toronto Western Hospital and the Toronto Rehabilitation Institute, the Centre for Healthcare Engineering Research, and the Centre for Excellence in Education and Practice (Toronto Western Hospital)* - to name just a few. In many cases, when individuals seek advice on how to address patient safety problems in their clinical areas or input on potential research projects, I see the Centre's role as putting people in touch with these existing experts, rather than attempting to replicate their expertise and activities.

Improving patient safety, by its nature, demands collaboration across professions and disciplines. My hope for the Centre, therefore, is to connect the many individuals and groups already working in patient safety within the University of Toronto community, not create yet another silo competing with these groups.

Finally, people have frequently asked me if the Centre will focus only on patient safety or also address broader issues with healthcare quality in general. Realistically, it is very difficult to make a sharp distinction between safety and quality. Although the Centre's name mentions only patient safety, improving the quality of care in general represents the goal of all of our work. Thus, we have no plans to exclude topics or projects that focus on chronic disease management, closing gaps between ideal and routine practice and other issues traditionally associated with quality improvement rather than patient safety. That said, other groups in the University of Toronto already address many of these issues in quality improvement, so we will look for ways to connect with these groups, rather than take on such issues in isolation.

While much of this first year has focused on administrative activities, we have managed to accomplish a lot - 30 papers published and 13 grant applications totaling $8,964,134 have been submitted to various agencies. Of these, six grants have already been successfully obtained, totaling $572,950 in external funds. This report highlights our accomplishments including the very successful launch symposium held in October, the development of our strategic priorities and details our publications and grants. I am thrilled with these early accomplishments. I look forward to building on them to achieve the ultimate goal for the Centre, namely making concrete improvements in the safety and quality of care delivered to patients here in Toronto and eventually across Canada and internationally.

III. Governance



Consistent with the model for other multi-departmental academic units at the University of Toronto, governance of the Centre for Patient Safety comprises an Executive Committee and an Advisory Council.

The Executive Committee advises on high level strategy for the Centre and provides oversight, ensuring progression towards achieving our goals. The Advisory Council provides more direct support for the ongoing development and work of the Centre.

EXECUTIVE COMMITTEE

- Dr. Catharine Whiteside (Chair), Dean of Medicine and Vice-Provost, Relations with HealthCare Institutions.
- Mary Jo Haddad, President and CEO, Hospital for Sick Children
- Dr. Barry McLellan, President and CEO, Sunnybrook Health Sciences Centre
- Dr. Sioban Nelson, Dean of Nursing
- Dr. David Mock, Dean of Dentistry
- Dr. Cheryl Regehr, formerly Dean of Social Work (now Vice-Provost, Academic Programs, University of Toronto)
- Dr. Mark Rochon, President and CEO, Toronto Rehabilitation Institute

ADVISORY COUNCIL

- Dr. Robert Bell, President and CEO, University Health Network, and Professor of Surgery (Orthopedics), University of Toronto
- Dr. Michael Baker, Professor of Medicine, University of Toronto and Executive Lead for Patient Safety, Ontario Ministry of Health and Long-Term Care
- Dr. Diane Doran, Professor of Nursing, University of Toronto
- Dr. Douglas Cochrane, Professor of Surgery (Pediatric Neurosurgery), University of British Columbia, and Board Chair, Canadian Patient Safety Institute
- Dr. Tejal Gandhi, Executive Director of Quality and Safety, Brigham and Women's Hospital, Boston, Associate Professor of Medicine, Harvard Medical School
- Dr. Uma Kotagal, Senior Vice President for Quality and Director, Health Policy and Clinical Effectiveness, Cincinnati Children's Medical Centre
- Dr. Robert Wachter, Professor and Associate Chairman, Department of Medicine, University of California San Francisco, and Editor Agency for Healthcare Research and Quality. Websites: *PSNet and WebM&M*.

IV. Staff Profiles

Kaveh G. Shojania, *MD*
Director

Canada Research Chair, Patient Safety & Quality Improvement

After medical school and internship in Canada, Dr. Shojania completed his residency in Internal Medicine at Brigham and Women's Hospital/Harvard University in Boston, one of the world leaders in patient research. Following a fellowship in outcomes research at the University of California San Francisco, he stayed on faculty there for four years before returning to Canada – first to the University of Ottawa and more recently the University of Toronto. He holds a Canada Research Chair in Patient Safety and Quality Improvement.

Dr. Shojania's research focuses on identifying evidence-based patient safety interventions and effective strategies for translating evidence into practice. His work has appeared in leading journals, including the *New England Journal of Medicine*, the *Journal of the American Medical Association*, the *British Medical Journal*, and the *Canadian Medical Association Journal*. He has twice delivered invited presentations on patient safety to the US Institute of Medicine. He led the synthesis of supporting evidence for over 75 specific patient safety practices for a report funded by the US Agency for Healthcare Research and Quality. Over 140,000 copies of this report, Making Healthcare Safer, have been obtained since its publication 2001.

Dr. Shojania has also led a number of educational initiatives in patient safety, including a series of 13 case-based articles in Annals of Internal Medicine and two websites produced for the US Agency for Healthcare Research and Quality, which receive approximately 100,000 visits each month. A book on patient safety for a general audience that he co-authored with Dr. Robert Wachter (at the University of California San Francisco) received excellent reviews in the New York Times and Journal of the American Medical Association and has sold approximately 50,000 copies. For this and other work, Drs. Shojania and Wachter received one of the John M. Eisenberg Patient Safety Awards from the US Joint Commission for the Accreditation of Healthcare Organizations and the National Quality Forum.

Anne Matlow, *MD MSc, FRCPC*
Associate Director and SickKids Site Director

Dr. Matlow is Medical Director of Patient Safety and Infection Prevention and Control at SickKids and a Professor in the Departments of Pediatrics, and Laboratory Medicine and Pathobiology at the University of Toronto. She received an MSc in Microbiology and Immunology from McGill University, graduated from the University of Toronto Faculty of Medicine, and obtained specialty qualifications in Internal Medicine, Infectious Diseases, and Medical Microbiology. In 2003 she graduated with the inaugural class of the American Hospital Association/ Health Forum's Patient Safety Leadership Fellowship.

Dr. Matlow is active in Patient Safety and Infection Control activities at the local, national, and international levels. She sits on the Executive Board of the Canadian Patient Safety Institute, is a member of the patient safety collaborative of the Canadian Association of Pediatric Health Centres, and is co-founder and chair of the Pediatric International Patient Safety and Quality Collaborative (PIPSQC), a collaborative with members in Canada, the United States, the United Kingdom and Australia. Dr. Matlow has helped develop educational initiatives in patient safety at the University of Toronto and is working on a curriculum focused on paediatric patient safety through the Paediatric Chairs of Canada.

Dr. Matlow's passion for patient safety in paediatrics spans a number of topics, but she is particularly focused on the importance of communication and family involvement as well as the identification and disclosure of adverse events. Currently, she leads a multicentre national study implementing the newly developed Canadian Association of Paediatric Health Centres' Trigger Tool to characterize the epidemiology of adverse events in hospitalized children. The results of this study, the first of its kind in Canada, will identify key targets for efforts to improve the safety of healthcare delivery to hospitalized children.

Edward Etchells, *MD, MSc, FRCPC*
Associate Director and Site Director,
Sunnybrook Health Sciences Centre

Dr. Etchells received his MD and subsequent specialty training in General Internal Medicine at the University of Toronto. He joined the faculty of the Department of Medicine after completing an MSc in Clinical Epidemiology. Although his initial academic interest was clinical bioethics, with a focus on informed consent and decision making capacity, he realized - after five years of inpatient attending - that safe and reliable delivery of healthcare were recurrent problems. After delivering teaching rounds and presentations in patient safety at the University Health Network (Toronto Western Division) he moved to the SHSC to direct the Error Management Unit, inspired by Dr. Donald Redelmeier. Dr. Etchells conducted some of the original research that established medication reconciliation globally as a best practice in patient safety and he was a co-investigator on the Canadian Adverse Events Study.

Working with Dr. Redelmeier, he co-founded the Patient Safety Service, the first hospital-based academic safety service in Canada, with support from the SHSC senior leadership team. The Service delivers educational programs in patient safety to hospital staff and students as well as national and international audiences. The Service's 2005 paper 'Unintended Medication Discrepancies at the Time of Hospital Admission" is cited as a patient safety classic on the Agency for Healthcare Research and Quality Patient Safety Net website and its novel methods for identifying and classifying medication errors were adopted by the Canadian Safer Healthcare Now! and the World Health Organization's 'High 5's' medication reconciliation initiative.

Dr. Etchells helped to establish the Department of Medicine's Quality Partners program in 2006 and the U of T Certificate Program in Quality and Patient Safety in 2008. He is Medical Director of Information Services at SHSC. His research interests include medication reconciliation, computerized medication order entry and real time alerting and decision support for critical laboratory values.

G. Ross Baker, *PhD*
Director of Graduate Studies

Dr. Baker is a Professor in the Department of Health Policy, Management and Evaluation at the University of Toronto. Together with Dr. Peter Norton, at the University of Calgary, he led the landmark Canadian Adverse Events study published in the Canadian Medical Association Journal in 2004.

Dr. Baker was a member of the National Patient Safety Steering Committee that recommended the creation of the Canadian Patient Safety Institute, and he has helped lead the Safer Healthcare Now! Campaign, the Canadian adaptation of the well known 100,000 lives campaign in the United States (and the subsequent five million lives initiative) focused on implementing widespread implementation of concrete improvements in patient safety. Further reflecting his national and international recognition as a patient safety researcher, Dr. Baker co-chairs key committees for the World Health Organization's Patient Safety Alliance.

Dr. Baker's educational and research activities focus on the epidemiology of patient safety problems and organizational innovations that enhance healthcare quality and safety. His book, "High Performing Healthcare Systems: Delivering Quality by Design" (2008), analyzed seven health care systems that have successfully used quality improvement tools and knowledge management strategies to transform their health delivery. In 2007, he received the Filerman Prize for Innovation in Health Management Education by the Association of University Programs in Health Administration (AUPHA).

Christopher Parshuram, *MD PhD PRCP*
Director of Pediatric Patient Safety Research

Dr. Parshuram graduated from Otago University of New Zealand (1990), with prizes in medicine and pharmacology. Following a residency in paediatrics at the Royal Children's Hospital in Melbourne, Australia, he moved to Canada where he completed specialist fellowship training in paediatric critical care medicine and clinical pharmacology in Toronto and Edmonton. His Doctoral Studies in Clinical Epidemiology at the University of Toronto focused on the subject of patient safety.

Dr. Parshuram joined the Department of Critical Care Medicine at the Hospital for Sick Children in 2003, and he is an investigator in Child Health Evaluative Sciences in the Research Institute. In addition to formal training in systems of healthcare delivery, Dr. Parshuram has expertise in cardiac arrest prevention, reducing errors that are associated with medications and preventing fatigue in healthcare workers. He has received peer-reviewed research funding from the Heart and Stroke Foundation of Canada, the Society of Critical Care Medicine, and the Canadian Institutes of Health Research. Dr Parshuram was the international member of the Institute of Medicine Committee on Optimizing Resident Duty Hours.

Leahora Rotteau, *MA*
Manager

Ms. Rotteau received her MA from the University of Waterloo Faculty of Applied Health Sciences. She worked in the Veteran's Centre at the Sunnybrook Health Sciences Centre before joining Dr. Shojania's research team as project manager for a national study of implementation issues for patient safety practices in pediatric and adult hospitals. She joined the Centre for Patient Safety in December 2009. Ms. Rotteau oversees the general operations of the Centre, coordinates initiatives and provides project support for Centre-based research programs. She brings expertise in project management and qualitative healthcare research to the team.

V. Launch Symposium

On October 21st, 2009, the Centre held its first annual symposium with the theme '*Achieving synergy between academic and operational efforts to improve patient safety*'. The event featured presentations by local, national and internationally recognized leaders in the science of patient safety, including people who have successfully improved patient safety by synergizing research with local operational efforts. Leaders from the three partner institutions, Dr. Catharine Whiteside, Dean of Medicine, Dr. Barry McLellan, Chief Executive Officer of Sunnybrook Health Sciences Centre and Dr. Larry Roy, VP Medical and Academic Affairs, Hospital for Sick Children, each delivered a welcome, as did Dr. Chris Hayes, Medical Officer of the Canadian Patient Safety Institute.

External speakers included Dr. Tejal Gandhi, Executive Director of Quality and Safety at Brigham and Women's Hospital in Boston and recipient of the 2009 John M. Eisenberg Patient Safety Research Award, Dr Uma Kotagal, Senior Vice President for Quality and Director, Health Policy and Clinical Effectiveness, at Cincinnati Children's Medical Centre, and Dr. Alan Forster, Director of the Ottawa Hospital Centre for Patient Safety. Other speakers included Dr. Michael Baker, Executive Lead for Patient Safety for the Ontario Ministry of Health and Long-Term Care, Dr. Linda McGillis Hall, Associate Dean of Research at the Faculty of Nursing, Dr. Chris Parshuram, Director of Pediatric Research for the Centre for Patient Safety, Dr. Robin McLeod, Professor of Surgery, and Dr. Dante Morra, Director of the Centre for Innovations in Complex Care at University Health Network.

The symposium had an impressive 183 registrants, ranging from front line hospital staff, to academic researchers interested in patient safety, though to senior hospital executives. Informal feedback was universally positive, and 78% of formal evaluations rated the event as "very good" or "outstanding". We were delighted with the quality of the presentations at this first symp sium and the palpable enthusiasm and engagement of the attendees.

L-R: Drs. Trey Coffey, SickKids; Kelly Thompson, Atkinson College, York University; Rita Damignani, SickKids; Polly Stevens, SickKids; Rachel Agbeko, SickKids.

VI. Strategic Priorities

To develop a strategic plan for the Centre, we conducted 20 individual interviews with potential stakeholders from relevant University Faculties, senior leaders from TAHSN hospitals, heads of academic Departments, patient safety researchers, safety/quality officers, and representatives of the Ministry of Health and Long Term Care and the Ontario Hospital Association. The interviews focused on potential activities or roles for the Centre, needs it might fill for each interviewee's constituency and suggestions for directions and roles to avoid.

We also included a strategic planning session at our October 21st launch symposium. Attendees engaged in small group discussions (tables of 5-8 people) addressing specific elements of the plan and proposed new suggestions. Each table was assigned a person to take notes using a structured form and Directors of the Centre circulated among the tables during the discussion period. We formally collated and reviewed the documented feedback provided by each table, as well as the comments from interviews with stakeholders conducted prior to the symposium. The interviews and strategic planning session clearly identified four priority areas:

1. *Faculty development*
2. *Education*
3. *Fostering connectivity*
4. *Research*

L-R: Dr. Dante Morra, Director, Centre for Innovations in Complex Care at the University Health Network and Dr. John Bohnen, Vice Dean, Clinical Affairs, University of Toronto.

L-R: Dr. Dante Morra, Director, Centre for Innovations in Complex Care at the University Health Network and Dr. John Bohnen, Vice Dean, Clinical Affairs, University of Toronto.

Strategic Priority #1 – *Faculty Development in Patient Safety*

We regard faculty development as key to the success of the Centre. In other areas of biomedical research, progress occurs through the efforts of scientists who typically leverage their efforts through graduate students, postdoctoral fellows and other research trainees. While this can also occur in patient safety research, there also exists an important role for researchers to partner with clinicians, who often take the lead on implementing specific interventions. Clinical faculty have the understanding of front-line processes necessary to implement changes to existing care delivery, as well as the respect of other colleagues required to generate buy-in. In many cases, it is simply not possible to send a graduate student to spearhead the implementation of a new guideline, checklist or technology related to patient safety.

Thus, leveraging the expertise of researchers in patient safety may best involve partnerships with clinical faculty members who have sufficient knowledge of patient safety to help develop candidate interventions and spearhead their implementation. To further the goal of developing a cadre of clinical faculty with expertise in patient safety, we have developed a certificate course aimed at faculty and senior trainees, as well as a distinct academic pathway to help support their professional development and academic promotion.

U of T Certificate in Patient Safety and Quality Improvement.

In collaboration with the Centre for Faculty Development, we developed and piloted this course last year in anticipation of the formal launch of the Centre in 2009. For 2008-09, the course filled to capacity within two weeks of its announcement (39 participants). For 2009-10, we expanded the total number of hours to over 50 and 48 participants enrolled. We also received a grant from the Ministry of Health AFP Innovation Fund to support the further development and evaluation of this course. Participants to date have represented all the fully affiliated teaching hospitals and some of our community partners as well.

Participants in University of Toronto Certificate Course in Patient Safety and Quality Improvement

Institution	2008-09	2009-10
Sunnybrook Health Sciences Centre	10	10
SickKids	8	8
University Health Network	7	6
St Michael's Hospital	4	8
Mount Sinai Hospital	1	3
Centre for Addictions and Mental Health	3	1
Women's College Hospital	1	-
Baycrest	2	-
Toronto East General Hospital	-	3
Lakeridge Health	-	2
Trainees – Multiple Sites	3	5
Other	-	2
Total	**39**	**48**

Lecturers have included local researchers in the fields of patient safety and quality improvement, an Assistant Deputy Minister of Health and a well-known human factors specialist from Ann Arbor, Michigan. Participants come roughly every second Friday for four hours over approximately seven months for a mixture of didactic lectures, interactive sessions and presentations by class participants to receive feedback on their projects in development. Despite very busy schedules (participants include some division and department heads at their respective institutions) attendance has been consistently high. All sessions are video taped and available via podcast to accommodate participants who miss any of the classes.

A distinct career pathway for academic physicians engaged in patient safety and quality improvement

With widespread interest in quality improvement (QI) and patient safety, a new challenge exists in academic medicine, namely acknowledging the contributions of faculty members who excel in these areas. These faculty members range from clinician scientists with full-time research programs focused on healthcare quality to more operationally oriented faculty who lead local QI projects. However, most Faculties of Medicine do not have mechanisms to encourage the development of faculty engaged in QI activities. Dr. Shojania wrote (with Dr. Wendy Levinson, Chair of the University of Toronto's Department of Medicine) a commentary in the *Journal of the American Medical Association* advocating the need for a distinct promotion pathways for academic physicians engaged in patient safety and quality improvement work, and outlining specific metrics to support such a pathway. Drs. Shojania and Levinson are currently working to pilot this pathway in the Department of Medicine.

(R) *Two physician course participants trouble shooting the use of epinephrine injections with "Epi Pens" as part of a human factors exercise.*

(L) *Dr. John Gosbee, physician and human factors engineering specialist from Ann Arbor, Michigan (formerly at the Veterans Affairs National Center for Patient Safety in Ann Arbor) discusses a small-group exercise with two course participants.*

Strategic Priority #2 - *Education*

The Centre aims to develop robust educational programs in patient safety at all levels, and we have been very happy with progress already made in this first year.

POSTGRADUATE EDUCATION

Academic fellowships in patient safety

The Centre has supported its first postgraduate fellow, Dr. Brian Wong, with funding from the Canadian Health Services Research Foundation (as part of a grant led by Dr. Shojania) and the Department of Medicine at the Sunnybrook Health Sciences Centre. As part of this fellowship, Dr. Wong enrolled in the Improvement Advisor Professional Development program at the internationally renowned Institute for Healthcare Improvement (IHI) in Boston. As Dr. Wong has a special interest in developing robust educational programs in patient safety, he also enrolled in the Education Scholars program in the University of Toronto's Centre for Faculty Development. Dr. Wong has already received research funding to support his work and has published several papers, including one (in the Archives of Internal Medicine) that was highlighted in the US Agency for Healthcare Research and Quality's Patient Safety Net (www.psnet.ahrq.gov), which attracts over 50,000 visits each month, and the Wall Street Journal Health Blog[5].

Web-based education modules in patient safety

An online learning module – Patient Safety for Residents© – is under construction as part of a postgraduate medicine e-learning initiative called PGCorEd™. PGCorEd™ is a series of self-directed, web-based, learning modules delivered by residency training programs via the University of Toronto's Blackboard learning portal. PGCorEd™ focuses on generic foundational competencies and is mandatory for 1st and 2nd year postgraduate trainees. In addition, program directors use the modules for other learners and to meet additional educational objectives. Design features of the modules include the use of interactive approaches including 'games', case vignettes and evaluation using a 'key features' approach to reinforce learning.

Content module leaders for Patient Safety for Residents© are Drs. Anne Matlow and Susan Tallett (Director of the Learning Institute at Sick Kids). Four units serve as building blocks to the safety content for residents, each with individual content leads. They are:

i. Patient Safety - *Drs Anne Matlow & Kaveh Shojania*

ii. Communicating to Enhance Patient Safety - *Dr. Chris Hayes, Director of Patient Safety at St. Michael's Hospital and Medical Officer for the Canadian Patient Safety Institute*

iii. Recognizing and Responding to Risks - *Dr. Anne Matlow*

iv. Human Factors - *Dr. Edward Etchells.*

[5] *http://blogs.wsj.com/health/?s=brian+wong&x=33&y=15*

The Patient Safety for Residents© module is finishing the content development phase and will soon be moving forward to online production. The next step of pilot testing, refinement and module completion is targeted for launch in Spring 2010.

Core Resident Integrated Scholarly Program (CRISP)

Dr. Brian Wong, the Centre's first fellow (mentored by Drs. Shojania and Etchells) has developed three sessions on medical error, disclosing medical error, and failure mode effects analysis that have been incorporated into the CRISP program, delivered to trainees in the University of Toronto Core Internal Medicine Residency program.

Electives for Residents

Dr. Brian Wong has led the development of a longitudinal elective for second year Internal Medicine residents. In its first year, five residents chose to take part in this elective and are now engaged in quality improvement and safety projects. Three additional residents have been supervised for elective research programs, with project topics ranging from anticoagulant safety, the format of morbidity and mortality conferences on the General Internal Medicine service, to improving patient-centered care.

GRADUATE EDUCATION

Clinician Scientist Training Program (CSTP)

The ultimate goal of the CSTP in the Department of Medicine is to provide research training for individuals wishing to develop successful careers in biomedical research. Dr. Shojania has been invited to join the CSTP program committee and, with his participation, a quality and patient safety track has been developed with funding for one position[6] each year. Trainees in the CSTP receive a stipend of $50,000 per year plus benefits and graduate tuition.

Masters Degree Program

A Masters stream in patient safety is under development through the Department of Health Policy, Management and Evaluation (HPME). The first graduate course in this stream will be offered in 2010 by Drs. Shojania and Baker, with plans to add sufficient courses unique to patient safety and quality improvement to warrant a distinct stream within the HPME Masters and PhD programs. Until a distinct stream for Patient Safety exists, graduate students focused on this area - and supervised by faculty in the Centre for Patient Safety - will belong to whichever existing stream is most relevant to their work: Clinical Epidemiology, Health Services Research, Health Informatics, Health Administration or Management of Innovation.

[6] http://www.deptmedicine.utoronto.ca/edustudies/Advanced_Studies/Clinician_Scientist.htm

Graduate Supervision

All of the senior academic leaders of the Centre are established supervisors working with graduate students undertaking projects related to patient safety. Four masters students successfully defended their theses this year, including three in the Clinical Engineering program and one through the Institute for Medical Sciences. As well, two students are currently being supervised through the HPME Clinical Epidemiology program. We expect the number of graduate students to increase substantially over the next few years, especially once the formal graduate stream in patient safety is established at HPME.

UNDERGRADUATE EDUCATION

The Centre delivered a full day event focused on patient safety as a part of Determinants of Community Health course (DOCH-3) to 3rd year medical students just prior to beginning their clinical rotations. The event included an introductory lecture designed to orient students to the concepts of patient safety and the problems of medical error in clinical practice; two small group, case-based, sessions - one involving problems with patient handovers and one involving a diagnostic delay; and a practical session on safe ordering writing. Although we await formal evaluation, the average score for the introductory lecture was 4.04. - a score Dr. Ian Johnson, Director of the DOCH course considers to lie in the 'outstanding' range based on medical student evaluations in general. The seminar score, of 3.58 also falls into a 'very good' range. We are encouraged by this very positive preliminary feedback and will carefully review student comments to explore ways of enhancing these sessions in 2010.

INTER-PROFESSIONAL EDUCATION

We are exploring the possibility of delivering lectures in patient safety as part of the inter-professional content for medical students, nurses and other undergraduate students in the healthcare professions. Dr. Shojania has also met with members of the Faculty of Pharmacy to explore opportunities in graduate education and continuous professional development.

Strategic Priority # 3 - *Fostering Connectivity*

A central repository of information and activities related to patient safety

We anticipate launching the Centre's website by March 2010 to support educators and researchers in patient safety and quality improvement. In addition to promoting the vision and mission of the Centre, the site will function as a centralized repository of information about patient safety across the UofT community. It will include information on study programs, events, publications and a searchable inventory of completed and ongoing projects related to patient safety with brief descriptions and the contact information for the project lead. A protected website area and/or Portal shell for study and collaboration between Centre members is also planned. This particular feature has received very positive feedback from stakeholders as it will greatly enhance collaboration and provide individuals with valuable opportunities to learn from others engaged in similar improvement efforts. We are also developing a monthly e-newsletter that will have an extensive email circulation and be posted on the site.

Finally, the website will include a portal through which faculty and staff affiliated with the University of Toronto or TAHSN hospitals can request consultations with Centre staff. These consultations might provide advice on evaluation of patient safety problems, developing implementation strategies for planned interventions, or planning evaluations of such projects.

Patient Safety Rounds

Patient safety rounds already occur on a regular basis at the SHSC and SickKids, and occasionally as part of Grand Rounds in Medicine, Pediatrics, Anesthesia and Surgery, as well as seminar series and other educational offerings in HPME and other academic departments and units. To enhance dissemination we will develop an inventory of these rounds and educational events and promote them on our website. We will also coordinate rounds hosted by the Centre to bring groups working in patient safety together to share information on ongoing projects and take turns highlighting research in progress in their respective groups.

Patient Safety Network for Hospital-based Departments of Quality and Safety

Most hospitals have operational Departments focused on accreditation activities, producing data relevant to provincial performance metrics and initiating other projects related to locally identified safety or quality problems. Unfortunately, these Departments typically work in isolation. Working with the Ontario Hospital Association, we are developing a forum for individuals from these hospital-based Departments to meet periodically in order to discuss their activities. These meetings will provide opportunities for hospitals to learn from each other, identify possible collaborations around initiatives that they share in common and prevent duplication.

Strategic Priority #4 - *Generating New Knowledge In Patient Safety*

On the basis of input received during the strategic planning process, our vision for research seeks to balance existing areas of focus of our core members with developing areas that have the potential to be uniquely associated with the Centre. Areas of existing research of the Centre's core members include assessing the evidence in patient safety, identifying barriers and facilitators to implementing patient safety practices, computerized order entry and decision support, medication reconciliation, the impact of clinician fatigue, infection control, trigger tools, and organizational governance. Our research products for this first year mostly reflect these existing areas of focus. However, over the coming years, we plan to focus on areas that we believe can become known as ones especially associated with the University of Toronto Centre for Patient Safety.

VII. Grants And Publications

Grants Successfully Obtained in 2009

1. Measuring the Quality of Hospital Care of Children and Youth in Canada. Astrid Guttmann, Geoffrey M. Anderson, **Anne G. Matlow, Christopher Parshuram**, Teresa To et al. CIHR $75,000 over 3 years and MOHLTC $300,000 over 3 years.
2. Enhancing Patient Safety using Web Based Simulation Project. Sue Glover-Takahashi, **Anne Matlow**, Susan Tallett, Glen Bandiera, Jody McIlroy. Network for Excellence in Simulation for Clinical Teaching and Learning. $50,000.00.
3. Epidemiology of adverse events in children in community hospitals. **Anne Matlow, Ross Baker**, Virginia Flintoft, et al. Canadian Patient Safety Institute, $120,000.
4. Developing a Certificate Course in Patient Safety. **Kaveh Shojania, Edward Etchells**, Claude LaFlamme. Sunnybrook Alternate Funding Plan (AFP) Innovation Fund, $38,500.
5. Validation and improvement of measures of hospital performance and patient safety in Ontario. **Kaveh Shojania**, David Henry, Therese Stukel. Ontario Ministry of Health and Long-Term Care, $200,000.
6. Closing care gaps in cardiovascular medicine. Dan Hackam, David Alter, **Kaveh Shojania**, et al. Canadian Institutes of Health Research, $89,450.

Grants Submitted in 2009 *(decisions pending)*

1. The Economics of Patient Safety. Nicole Mittman, **Edward Etchells, Anne Matlow, Kaveh Shojania**, et al. Canadian Patient Safety Institute, $116,030.
2. Promoting Real-Time Improvements in Safety for the Elderly (PRISE) Study. **Kaveh Shojania, Brian Wong, Edward Etchells**, et al. Canadian Patient Safety Institute, $260,000 ($130,000 from granting agency, $130,000 institutional matched support)
3. Using an Innovative RFID system to measure hand hygiene compliance. **Edward Etchells**, Merrick Zwarenstein, et al. Sunnybrook Alternate Funding Plan (AFP) Innovation Fund, $76,050.
4. A SMART Adverse Events Tracking System for Physicians. Natalie Coburn, **Edward Etchells**, et al. Sunnybrook Alternate Funding Plan (AFP) Innovation Fund, $99,760.
5. The Bedside Paediatric Early Warning System: a cluster randomized trial of mortality and processes of care. **Christopher Parshuram**. Canadian Institutes of Health Research (CIHR), $6,542,810.
6. Education, Patient Care & Trainee Wellbeing in Ontario Teaching Hospitals: a survey of trainees. **Christopher Parshuram**. Canadian Institutes of Health Research (CIHR). $716,534.
7. The epidemiology of TRALI (transfusion-related acute lung injury) in neonates: A prospective multi-centre cohort study. **Christopher Parshuram**, Kathryn Webert, Canadian Institutes of Health Research (CIHR), $580,000.

Publications in 2009

1. **Shojania KG**, Levinson W. Clinicians in quality improvement: A new career pathway in academic medicine. JAMA. 2009; 301(17):766-8.
2. **Matlow AG**, Morris SK. Control of antibiotic-resistant bacteria in the office and clinic. CMAJ. 2009;180(10):1021-4.
3. **Shojania KG**, Jennings A, Mayhew A, Ramsay C, Eccles M, Grimshaw JG. The effects of point of care computer reminders on physician behaviour: a systematic review. CMAJ; accepted for publication.
4. Kennedy TJ, Regehr G, **Baker GR**, Lingard L. Preserving professional credibility: grounded theory study of medical trainees' requests for clinical support. BMJ 2009;338:b128.
5. Wright J, **Shojania KG**. Measuring the quality of hospital care. BMJ. 2009; 338: b569.
6. **Etchells EE**, Adhikari NKJ, et al. Real Time Clinical Alerting: effect of an automated paging system on respose to critical laboratory values-a randomized trial. Qual Saf Health Care; in press.
7. **Parshuram CS**, Hutchison J, Middaugh K. Development and initial validation of the Bedside Paediatric Early Warning System score. Crit Care 2009;13:R135.

8. Amaral AC, **Shojania KG**. The evolving story of medical emergency teams in quality improvement. Crit Care. 2009;13(5):194.

9. **Wong BM**, Quan S, Cheung CM, Morra D, Rossos PG, Sivjee K, Wu R, **Etchells EE**. Frequency and clinical importance of pages sent to the wrong physician. Arch Intern Med. 2009;169(11):1072-3.

10. Wong BM, Quan S, Shadowitz S, **Etchells E**. Implementation and evaluation of an alphanumeric paging system on a resident inpatient teaching service. J Hosp Med 2009;4(8):E34-40.

11. Langley JM, Gravel D, Moore D, **Matlow A**, et al. Cerebrospinal fluid shunt-associated infections in the first year following placement: a CNISP study. Infection Control and Hospital Epidemiology. 2009; 30(3):285-8

12. Vayalumkal JV, Gravel D, Moore D, **Matlow A** and the CNISP Surveillance for Healthcare-Associated FRI in Pediatric Hospitals participating in CNISP. Infection Control and Hospital Epidemiology 2009;30(7):652-8.

13. Coffey M, Mack L, Streitenberger K, **Matlow A**. Prevalence and Clinical Significance of Medication Discrepancies at Pediatric Hospital Admission. Acad Pediatr. 2009: 9:360-5.

14. Soo S, Berta W, **Baker GR**. Role of champions in the implementation of patient safety practice change. Healthc Q 2009;12: 123-8.

15. Coffey M, Cornish P, **Etchells E, Matlow A**. Implementation of Admission Medication Reconciliation at Two Academic Health Sciences Centres: Challenges and Success Factors. Healthc Q. 2009;12 :102-9.

16. Doran DM, Hirdes J, Poss J, Jantzi, M, Blais R, **Baker GR**, Pickard J. Identification of safety outcomes for Canadian home care clients: evidence from the resident assessment instrument--home care reporting system concerning emergency room visits. Healthc Q 2009;12:40-8.

17. **Matlow A**, Moody L, Laxer R, Stevens P, Goia C, Friedman JN. Disclosure of Medical Error to Parents and Pediatric Patients: Assessment of Parents' Attitudes and Influencing Factors. Arch Dis Child; 2009 Nov 29. [Epub ahead of print].

18. **Wong BMF, Etchells E**, Kuper A, Levinson W, **Shojania KG**. Teaching Quality Improvement and Patient Safety to Trainees: a Systematic Review. Acad Med; accepted for publication.

19. Sarkar U, Handley MA, Gupta R, Tang A, Murphy E, Seligman HK, **Shojania KG**, Schillinger D . What Happens Between Visits? Adverse and Potential Adverse Events Among a Low-Income, Urban, Ambulatory Population with Diabetes. Qual Saf Health Care 2009; accepted for publication.

20. **Shojania KG**, Jennings A, Mayhew A, Ramsay C, Eccles M, Grimshaw JG. The effects of on-screen, point of care computer reminders on processes and outcomes of care: a systematic review. Cochrane Database Syst Rev. 2009 Jul 8;(3):CD001096.

21. Bump GM, Dandu M, Kaufman SR, **Shojania KG**, Flanders SA. How complete is the evidence for thromboembolism prophylaxis in general medicine patients? A meta-analysis of randomized controlled trials. J Hosp Med. 2009 May;4(5):289-97.

22. **Shojania KG**, Girard NJ. Do unexpected deaths indicate a patient safety problem? AORN J. 2009 May;89(5):956, 838.

23. Ting HH, **Shojania KG**, Montori VM, Bradley EH. Quality improvement: science and action. Circulation. 2009;119(14):1962-74.

24. Doherty DR, **Parshuram CS**, Gaboury I, et al. Hypothermia therapy after pediatric cardiac arrest. Circulation 2009;119:1492-500.

25. Emery DJ, Forster AJ, **Shojania KG**, Magnan S, Tubman M, Feasby TE. Management of MRI Wait Lists in Canada. Healthcare Policy. 2009; 4(3): 76-86.

26. Forster AJ, Boyle L, **Shojania KG**, et al. Identifying Patients with Post-discharge Care Problems Using an Interactive Voice Response System. J Gen Intern Med 2009;24:520-5.

27. Burrows JM, Callum JL, Belo S, **Etchells E**, Leeksma A. Variable pre-transfusion patient identification practices exist in the perioperative setting. Can J Anaesth. 2009 Oct 9. [Epub ahead of print]

28. Van Walraven C, Dhalla IA, Bell C, **Etchells E**, Stiell IS, Zarnke K, Austin PC, Foster AJ. Derivation and validation of the LACE index to presict early death of unplanned readmission after discharge from hospital to the community. (Accepted Can Med Assoc J October 2009)

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