UNIVERSITY OF TORONTO

The Surgical Spotlight

ON ALUMNI, FACULTY, RESIDENTS & FRIENDS OF THE DEPARTMENT OF SURGERY

WINTER 2008–2009

THE CHECKLIST

Bryce Taylor, left, and anaesthesiologist Raynauld Ko review the checklist. © Michael Stuparyk / Toronto Star. 2009. All Rights Reserved.

Each year an estimated 234 million operations are performed throughout the world. Associated surgical complications account for a substantial burden of disease. The Toronto General Hospital (UHN) Department of Surgery participated in a prospective study of the impact of a Safe Surgery checklist, sponsored by the World Health Organization (WHO). The study included eight hospitals in a variety of settings – Jordan, India, Tanzania, the Philippines, Seattle WA, London UK, Auckland NZ and Toronto. 3733 patients were enrolled during a baseline period. The rates of mortality and complications were 1.5% and 11%. Following the introduction of a checklist designed and implemented by the investigators, these rates fell to 0.8% for death and 7% for complications in the next 3955 patients. A full presentation of the findings was published in the *New England Journal of Medicine* in January 2009. (1)

Last year, Lorelei Lingard, Glenn Regehr, Richard Reznick and their colleagues published a study of the impact of a checklist on communication in the operating room. They used a simple, clear design: observe, introduce, then observe and compare. (2) The checklist improved communication, collaboration and safety. WHO approached Richard Reznick to join a cohort study of

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the effect of a surgical checklist on complications of elective surgery. Richard proposed Toronto General Hospital as one of the clinical sites for the study. Bryce Taylor assumed the leadership role in this initiative and with the enthusiastic support of Chief Executive Officer Bob Bell the study was activated in November of 2007. Anne Slater, Richard's able executive assistant was seconded to manage the data.

Richard feels that this is "a defining paper that shows that lives can be saved through the use of the checklist. It is not *definitive* because it does not show how the lives were saved. It is also defining because it takes down hierarchical boundary lines, especially communication boundaries in the operating room. The impact of the checklist might be greater in settings where surgery is conducted on a production line model – where the surgeon doesn't meet the patient until she enters the operating room." Combat zones, specialized high volume surgery centres and less developed countries might show a greater benefit. Nevertheless, in Auckland, London, Seattle and Toronto the effect on complications was highly significant, though not as profound as it was in the lower income venues.

The checklist was quickly accepted thanks to the efforts of Bryce Taylor and Anne Slater, and is now standard procedure at Toronto General. The Ontario Hospital Association, the Canadian Surgical Chairs, and the Canadian Patient Safety Institute have all agreed to adopt it. Bryce Taylor attended the meeting in Geneva in which the eight surgical groups finalized the research plan. Bryce praises Anne for her effectiveness in gathering the data and completing the follow-up. Bryce's role was "to spread the word, prod and encourage participation". The strong endorsement of Bob Bell proved particularly helpful to this effort. Bryce will give talks across the country to disseminate the findings. "We had passion, persistence and persuasion before. Now we have proof. Though we can't prove that mortality was decreased in high-income centres, the complication rate was significantly reduced. We can protect 60,000 patients per year in Canada based on the overall 4% reduction in complications. (4.9% in low-income centres and 3.1% in high-income centres.) Our goal is to make the checklist as automatic as putting on the seatbelt in your car."

Seatbelts save lives, take little effort and don't cost very much. Some surgeons now say that they don't feel right unless they complete the checklist before starting the case, just as they don't feel comfortable driving unless they use a seatbelt.

Adrian Boelen a retired pilot in Dorval wrote a sobering letter to the *National Post*: "Checklists in aviation have been in use pretty well since the Wright brothers. One wonders whether such checklists would have been introduced much earlier in medicine if surgeons shared the fate of their patients, as pilots share that of their passengers."

The authors and commentators on the study raised the question whether the improvement is related to the Hawthorne effect – the tendency for people to improve their behaviour when they know that they are being watched. Bryce answers that this is an intensified variation on the Hawthorne effect. Everyone was aware that a detailed number of important factors were being observed and recorded. This knowledge, that data were being collected, automatically improved behaviour and improved outcome. "Observed behaviour is improved behaviour." He asks: "if you had an operation scheduled for tomorrow, would you want the operation to be done without the checklist? It is cheap, easy, takes two minutes to do and reduces complications. Shouldn't we be the first university to incorporate the checklist in all of our hospitals so that every resident will learn to incorporate the checklist as an essential component of every surgical operation?"

Anne Slater was responsible for collecting and recording all of the data for both phases of this study. She started with orientation of the nurses, trainees and surgeons at 6:45 each morning. Gillian Gravely, nurse manager of the operating room, introduced her to the nurses and operating room staff. Anne put the checklist questionnaire on fluorescent lime green sheets on the front of each chart. She recorded much of the data from the charts, working within the system to make it easier for the nurses and surgeons. This approach assured her welcome as part of the operating room team, rather than as a stranger or inspector. The baseline period ran for two months starting in November 2007. The second phase, after the checklist had become a routine part of care, began in March 2008 and finished in May 2008. "People got used to it; the checklist was stuck on the

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General Surgery in Peril?


Richard Reznick

General surgeons, broadly educated and capable of performing a wide spectrum of surgical procedures, have long been the backbone of hospitals and the surgical community. Unfortunately, a number of trends have emerged in recent years which suggest that general surgery may be in serious decline. This may be truer in the United States than in Canada, but notwithstanding the major differences in our health care systems, we often see changes that first occur in the U.S. echo in Canada a decade later. In that regard, we should be aware and concerned about some of the current threats to general surgery that are occurring south of the border.

A January 2009 *Wall Street Journal* article, entitled "Surgeon Shortage Pushes Hospitals to Hire Temps" (1) highlighted the growing practice of hiring locum tenens through temporary staffing agencies to address general surgeon shortages in U.S. hospitals. Instead of local surgeons, many hospitals in the U.S. now have to staff their on-call roster by procuring "temporary" surgeons at a high cost.

The WSJ article tells the story of Dr. Peppers, a 42-year-old general surgeon who has "hit the road". Her typical month might now include a weekend in Springfield, Oregon, followed by two weeks at a rural Kentucky or New Hampshire hospital. Though she misses her husband, she earns double her old salary and has paid off a big chunk of her medical school debt. "I'd much prefer to be in my hospital in my little town," says Dr. Peppers, who is now licensed in five states. "But I don't see how that's possible."

This shift from the traditional practice paradigm to a *modus operandi* that requires general surgeons to shut down their practices in favour of more lucrative transitory assignments is symptomatic of many deep-seated issues that are plaguing this specialty. The *Wall Street Journal* article noted numerous causes to explain the waning popularity of the traditional general surgery practice, such as steep overhead expenses, reductions in surgical fees, punishing schedules, and the lure of more financially rewarding surgical specialities and subspecialties. In Canada, we are beginning to see some parallels, with the majority of our graduates in general surgery seeking further training and pursuing careers in a subspecialty of general surgery.

It is not beyond our imagination to see a five-person surgical group faced with the following scenario when a patient with a massively bleeding ulcer comes to the ER. The colorectal surgeon is away at a national meeting. The HPB has exceeded his mandated work hours for the past 24 hours and is home. The breast surgeon doesn't do emergency laparotomies. The minimally invasive surgeon did only two open ulcer operations during her residency training. And the surgical oncologist restricts his practice to melanoma and sarcoma.

To quantify this issue, the WSJ article cited a study published last year in the *Archives of Surgery*, which found that the number of general surgeons per capita has decreased by more than 25% since 1981 – a far more precipitous decline than was evident in other surgical specialties. (2) Not only has there been relative decline in this specialty, but the absolute number of general surgeons in the United States is decreasing. To compound matters, this issue is manifesting itself at a time when the health care system can ill afford to cope with a manpower issue of this magnitude, given the increased burden posed by the aging population. The situation is also exacerbated by the advancing age of the average general surgeon.

As bad as this problem is, it doesn't seem likely that it will be resolved any time soon. The specialty is losing popularity with medical students and residents, which does not bode well for the future. In the United States, there is an increased number of unfilled general surgery residency spots, more positions are given to lower ranked students, and there is a substantial residency attrition rate. Similarly, in Canada, analysis of the CARMS database has revealed that the number of applicants selecting general surgery as their first choice is in decline. (3) Fortunately, this trend has not affected our own residency program in General Surgery at U of T.

Students are increasingly being attracted to more lucrative specialties with more predictable schedules. For instance, it has been found that there is a perception among many female medical students that a career in general surgery is incompatible with having a well-balanced family life. This is a major issue in a time when around 50% of medical

students are female. (4) There are also generational issues that will further reduce the ranks of general surgeons in the future. Young medical students, both male and female, are increasingly seeking to work reduced hours and opting to apply to "controllable lifestyle specialties", which have lighter workloads, predictable hours, and greater flexibility.

Of the students who do opt for general surgery careers, more and more of them are choosing to narrow their scope of practice and subspecialize. Currently, over 70% of graduating general surgery residents pursue fellowship training, compared with only 55% a decade ago. (5) Moreover, with general surgery becoming increasingly more sophisticated as a result of medical and technological advancements, a specialized workforce will be in greater demand, prompting more graduates to seek advanced training. At the same time, the increasing sophistication of the field means that it is less and less likely that a "general" general surgeon will be able to master all the competencies required to provide such a broad range of care.

While surgeon shortages haven't yet spawned a booming temporary medical recruitment industry in Canada, many trends playing out south of the border, such as the shift to reduced hours, are being mirrored in the Canadian health care system. In fact, it may not be long before our hospitals will have to adopt similar measures to address workforce shortages. The time has come for us to consider ways to address the systemic problems that threaten this specialty by tackling issues surrounding training, lifestyle, workload, and compensation. If current trends prevail, we will be faced with a deepening shortage of general surgeons, and the specialty of general surgery will continue to be under threat.

The Chair would like to thank Maggie Jugenberg for her research and assistance with this column.

Richard K. Reznick
R.S. McLaughlin Professor and Chair

(1) Fuhrmans, V. Surgeon shortage pushes hospitals to hire temps. *The Wall Street Journal*. January 13, 2009.

(2) Lynge CD, et al. A longitudinal analysis of the general surgery workforce in the Unites States, 1981-2005. *Arch Surgery*; 143:345-350, 2008.

(3) Marschall, JG. Karimuddin, AA. Decline in popularity of general surgery as a career choice in North America: review of postgraduate residency training selection in Canada, 1996-2001. *World J of Surg*; 32(6), June 2008.

(4) Scott, IM. Matejcek, A. Gowans M, Diet, MN. Wright, BJ. Brenneis, FR. Choosing a career in surgery: factors that influence Canadian medical students' interest in pursuing a surgical career. *Can J Surg*, Vol. 51(5), October 2008.

(5) Stitzenberg, K. Sheldon, GF. Progressive specialization within general surgery: adding to the complexity of workforce planning. *J Am Coll Surg*. Vol. 201, No.6, December 2005.

Two interesting approaches to this problem are discussed in "What is an Acute Care Surgeon and why do we need them?" (Spotlight Fall 2008) and the Editor's Column (Spotlight Fall 2007). Ed.

LEADERSHIP DAY

Surgical Leadership Day will take place Friday, April 24, 2009 at the Vaughan Estate from 9 am to 430 pm. The program will include faculty from the Rotman School of Management and Harvard University. Please contact your University Division Chair or Surgeon-in-Chief to apply. Recommended applicants should register with martin.mckneally@utoronto.ca and julie.roorda@utoronto.ca .

LEADERSHIP DAY 2009 PROGRAM

"Leadership Lessons from Shakespeare"
Jim Fisher will present a framework for blending management, leadership, and engagement of your followers, using examples that range from Shakespeare to his personal leadership journey in business.

"The Responsibility Matrix Revisited"
Brendan Calder will lead an interactive conversation about the application of the responsibility matrix to the leadership problems faced by surgeons.

"Managing Expectations and Competition in Senior Leadership Teams"
Miles Shore will analyze examples from the US political arena and recent research studies on high performance teams.

"Larry King Interviews Bryce Taylor"
Joe D'Cruz will help Bryce to reflect on the lessons he has learned from his recent experiences as Surgeon in Chief.

Industrial Interests and Surgeons' Obligations

A spirited debate on the role of industry funding in surgery was the highlight of the winter quarter dinner meeting of the St. Michael's Hospital surgery department. A background paper provided to the speakers by orthopaedic resident **Mark Camp** described how the US Federal government, concerned about the escalating cost of 700,000 hip and knee replacements per year, initiated an investigation by the Department of Justice. Criminal charges were filed against four major orthopaedic manufacturers for violating federal anti-kickback statutes. US $800 million had been paid to orthopaedic consultants as royalties or consulting fees for teaching, research, training sales representatives in the operating room and travel. Fines of $310 million have been paid under a deferred prosecution agreement, and criminal prosecution of individual surgeons is threatened.

Tim Daniels

Orthopaedic surgeon **Tim Daniels**, who organized the meeting, introduced the speakers and the topic. He told us that 90% of the $21 billion pharmaceutical marketing budget is directed at physicians. Research funding for multicentred trials in the US is heavily weighted toward industry. Private foundations provide $10 billion, federal funds $29 billion, and industry $60 billion. NIH funding for research has remained static as the burden of disease increases. 94% of US physicians have some relationship with industry. The Food and Drug Administration cannot find enough unconflicted physicians to fill its advisory boards. Awareness of abuse, kickbacks and biased publications is eroding public trust in the profession. If funding by industry were prohibited, the gap will never be filled by public or private sources. Industry has an important role, but its governance is currently under critical review.

Doug Thomson, Executive Director of the Canadian Orthopaedic Association (COA) and former industry CEO, set the stage, asking: "How far is too far in the surgeon-industry relationship?" He showed a flurry of news headlines describing bribes, kickbacks, and confusion about conflict of interest management. He quoted the Royal College Surgical Ethics Curriculum and clarified the values guiding the ethic of business, where "financial rewards are culturally accepted for enhancing profits". He cited the standards of the COA and advocated a publicly accessible website for publishing an "open book account" of all industry payments to physicians. This accounting was mandated by the US court for Zimmer, Biomet, Depuy, and Smith & Nephew, as part of the court's preliminary settlements with these orthopaedic manufacturers. The Cleveland Clinic, under the leadership of its innovative and entrepreneurial CEO, cardiac surgeon Toby Cosgrove, will now voluntarily publish all industry payments to its physicians and surgeons.

Allan Gross

Orthopaedic surgeon and Blue Jays team doctor **Allan Gross** claimed that "we've come so far by doing it just right". He offered the evidence that some surgeons voluntarily divert industry funds to third party oversight by their department, hospital or training program director, and they contribute directly from their salaries to support research. He described the critical importance to industry of *surgeon designers*, who uniquely know the field conditions that will determine the usefulness of a medical device. They should be compensated through royalties or contracts – if and only if they participate in the design. *Surgeon consultants'* legitimate role should be paid by reasonable fees on an hourly or annual basis for the development of courses, skill centres and for preceptorships and direct surgeon-to-surgeon case consultation and reviews. He decried the misuse of royalties or annual fees when they are used as a kickback to promote the company's business interests, and the use of lavish resorts for education, describing these as efforts to recruit surgeons, fellows and residents to be future customers.

Solly Benatar

Physician bioethicist **Solly Benatar**, Emeritus Professor of Medicine at the University of Cape Town and a faculty member of the University of Toronto's Joint Centre for Bioethics took us to the 30,000 foot level. Based on the writing of Eliot Freidson, (1) he argued that the logic of professionalism, rather than commercialism, consumerism, bureaucracy or law should guide our management of this issue. The logic of professionalism is based on trust in the knowledge, dedication and self-regulation of professionals, whereas market logic is based on freedom, rational choice, competition and consumerism. Professionalism is being eroded by expansion of self-interest and expanded control of research by the financial interests of industry. The conflict illustrated in Solly's nearby figure pulls us away from surgery as a calling to a valued social service and toward personal entrepreneurial (2) self-interested striving, a highly valued activity in the market ideology and logic. Quoting Edmund Pellegrino, his suggested solutions include "reconfiguring medical economics to foster the classical ideals of commitment to individuals, public good, and altruism"; and "strengthening of institutional ethics, taking into account the roles and legitimate interests and obligations of diverse parties". He cited the recent examples of erosion of professionalism such as the revelation of kickbacks ("payment for collaboration, especially for illicit profits" *Canadian Oxford Dictionary*) and falsification of conflict of interest disclosure forms at prominent American universities. During a vigorous discussion period, Solly made reference to the imaginative and challenging 'Health Impact Fund' project (under the leadership of Thomas Pogge) to reshape pharmaceutical industry activites in a manner that enables development of drugs with potentially major beneficial effects on the health of large numbers of underserved people without reducing pharmaeuctical company earnings.

The surgeons expressed enthusiastic appreciation for the insights and the stimulating discourse provided by all of the participants, as exemplified by Jim Waddell's comments:

"This discussion was illuminating for all of us and though it focused primarily on orthopaedic surgery because of topicality, the dilemma about industry-physician relations is common in all areas of medicine and surgery. I don't see this as a black and white issue – certainly I'm not naïve enough to think that all physicians are good and all of industry is bad. There is a partnership between physicians and industry that is essential to the wellbeing of both. The problem as I see it is that the ethics of business and the ethics of professionalism are different. That doesn't make the ethics of one good and the ethics of

the other bad – just different. What's desperately needed is some type of interface between the two groups that satisfies the ethical needs of both, rewards people fairly for their intellectual property and ensures continued advances in medical care through responsible product development."

M.M.

(1) Freidson, Eliot. *Professionalism: The Third Logic* Chicago: University of Chicago Press, 2001.

(2) An entrepreneur is "a person who starts or manages a commercial enterprise, especially one involving initiative and financial risk". (*Canadian Oxford Dictionary*)

Teaching Minimal Access Surgery in Africa Using Skype

Allan uses telesimulation to teach a surgeon in Botswana laparoscopic suturing

Laparoscopic general surgeon Allan Okrainec's research focus is on the use of simulation for surgical education. He is currently completing a Masters degree in education at the University of Illinois in Chicago. Two years ago, Georges Azzie, paediatric surgeon at the Hospital for Sick Children, invited Allan to accompany him to Botswana to participate in Georges's long term project providing surgical care and education in Gaborone and Francistown. Lloyd Smith, a gifted laparoscopic surgeon from St. Joseph's Hospital joined them to help with the training. Because of his focus on education, Allan wanted to include the simulation-based Fundamentals of Laparoscopic Surgery (FLS) course as part of the educational program. FLS is a rigorous training course comprised of simulation training exercises and a written test. It was developed by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), and is now also endorsed by the American College of Surgeons.

The Botswana surgeons were able to double their initial scores after the training visit. However, only two of twenty surgeons were able to achieve an overall score required for FLS certification. The challenge was how to continue and reinforce the hands-on training. We have learned from Allan's colleague Carol-Anne Moulton at the Wilson Centre for Research in Education that distributed practice over time is superior to intensive short-term training. Since the trip to Botswana is a 26-hour sojourn from Toronto to Frankfurt to Johannesburg to Gaborone, regular follow-through training sessions were not feasible. Allan solved this problem with telesimulation using Skype, the software for video conferencing over the internet.

Telesimulation uses the internet to link simulators between an instructor and trainee in different locations. Using two simulators, computers, and a series of web-cams, the instructor can teach a trainee as if they were in the same room. Conditions in Botswana provided a natural experiment that could validate the telesimulation approach. Surgeons in Gaborone had good internet access; surgeons in Francistown did not. Both groups had unlimited opportunities to practice with the simulation box. Allan and Georges applied for and received a SAGES grant to test the telesimulation hypothesis. Seven of eight surgeons in the telesimulation curriculum passed the FLS exam, while only one of eight in the control group succeeded. The experiment has been extended to Columbia where 20 of 20 students qualified, and to Peru where 15 of 15 have qualified. The success of the program has been catalyzed by Oscar Henao, a surgeon from Columbia and current research fellow in the telesimulation lab at Toronto Western Hospital. Oscar travels widely for the project and translates for the teleconferences. Oscar is a fully-trained surgeon who will become a clinical fellow in the University of Toronto laparoscopic surgery program starting in July. There is currently a telesimulation course ongoing in Guyana, and soon others will start in Hungary and Nigeria. The next frontier is China.

One of the unsolved problems involves training of the entire medical team as well as maintenance of infrastructure. Cleaning and maintenance of equipment, preparation as well as handling of the instruments by operating room personnel all require deepening of the educational process. To address these needs, Allan and his colleagues are developing a Centre for Studies in Telesimulation and International Health Education at Toronto Western Hospital. Through this centre the team will broaden their educational programs to train other health care personnel. The focus will be on "training the trainers" in the

hopes that students in the program will ultimately go on to teach others in their own countries. The equipment for telesimulation has thus far been purchased through the SAGES grant and a generous donation from a former patient, but funding for the program remains a challenge. Allan continues to seek external grant funding, as well as support from private donors and foundations.

Allan was born in Gatineau, Quebec. He completed his medical degree and minimally invasive surgery fellowship at McGill, the latter under Gerald Fried, a pioneer in laparoscopic surgical education. Allan finished his general surgery training at McMaster in 2005. During medical

Allan Okrainec with wife Joelene and daughter Madison

school at McGill, Allan met his wife Joelene who is a paediatrician currently doing her fellowship in developmental paediatrics. Joelene and Allan recently welcomed a new addition to the family. Their 10-month-old daughter Madison has already traveled with them to Hawaii, Italy and Holland. Allan enjoys hockey, snowboarding and traveling. His telesimulation laboratory, ably staffed by Oscar, is always open for residents and faculty to develop their skills. A link to *The Globe and Mail* article describing Allan's work is available at http://www.theglobeandmail.com/servlet/story/RTGAM.20070914.wldoctor14/BNStory/specialScienceandHealth/

M.M.

Grassroots Quality Improvement:

A REGIONAL EFFORT IN VASCULAR SURGERY

Jack Cronenwett, left, and David Urbach

Quality improvement is elusive in individual surgical practice because variations are hard to recognize; the number of events such as deaths or major complications over an extended period of time is small for a single practitioner. Professor Jack Cronenwett, Chief of Vascular Surgery at the Dartmouth-Hitchcock Medical Center presented a fascinating solution to this problem at the University Department of Surgery Clinical Epidemiology rounds at Sunnybrook. He reviewed the Vascular Study Group of Northern New England's remarkably effective regional approach. The Group has been able to pool the experience of fifty vascular surgeons working in eleven hospitals. They have now accumulated data on more than 10,000 patients with 86% follow-up at one year. This data set was developed by a cooperative, collegial sharing of information and advice among the surgeons. They were able to develop uniform definitions, one-page data forms and a system for comparing outcomes and processes of care in the treatment of abdominal aortic aneurysms, carotid endarterectomy, lower extremity bypass, and more recently, carotid stents. Like the Northern New England Cardiovascular Disease Study Group (1) they lowered the incidence of mortality and complications of the Group as a whole to levels that rival those reported anywhere. For example, the mortality for abdominal aortic aneurysms is 2.9% for open procedures and 0.4% for endovascular stents. They raised the usage of preoperative beta blocker treatment to above 90% within 12 months of initiating a quality improvement cycle for this care process. Similar results have been achieved with the use of statins and the use of patches for carotid endarterectomy. Current projects include a drive to reduce complications, and the development of a risk-adjusting

and predictive tool to guide preoperative assessment and patient selection. For example, the combination of an elevated creatinine, chronic obstructive pulmonary disease, age greater than 70 and the need for suprarenal clamping, predicts a one year mortality of 70% in patients after elective open abdominal aortic aneurysm repair. This profile would dissuade most patients and surgeons from an open operation. Identifying and disseminating best practices and sharing of sophisticated data, including CT scans for collegial consultation, are current projects designed to improve the outcome for the entire cooperative group. Key lessons from this experience include the need for a physician leader at each site, the need for an overall project leader, the value of a regional rather than a national group to increase collegiality, communication and trust, and the need for a designated data manager at each site.

In the discussion period following the presentation, we learned that the quality improvement data, legally protected from discovery, has not resulted in malpractice litigation. Dr. Cronenwett, who followed Wayne Johnston as the editor of the *Journal of Vascular Surgery*, is clearly a dynamic leader in this area of practical, clinical research. He showed us his own data and how exposure to the pooled data of the group stimulated him to improve his use of beta blockers preoperatively. The data are otherwise anonymized so that individual surgeons or sites can learn where they stand with reference to the overall group, but are not generally informed about the results of other individual members of the group. The level of trust and collegiality is sufficiently high now that the group is sharing "naked data" in which hospitals are identified in the shared reports to inform discussions about best processes of care.

An earlier publication provides excellent discussion of the methods and accomplishment of this group.(2)

M.M.

(1) O'Connor GT, Plume SK, et al. A regional prospective study of in-hospital mortality associated with coronary artery bypass grafting. The Northern New England Cardiovascular Disease Study Group. *JAMA* Aug. 14, 1991;226(6):803-809.

(2) Cronenwett JL, et al. A regional registry for quality assurance and improvement: The Vascular Study Group of Northern New England (VSGNNE). *Journal of Vascular Surgery.* Dec. 2007;46(6):1093-1102.s

Looking for Mutations in Cancer Cells to Screen for Aggressive Prostate Cancers

Rob Nam with wife Yuna and children Amy and Matthew in Jamaica

Robert Nam is an active surgical oncologist who treats cancers of the kidney, bladder, prostate and testes in a busy clinical practice. He is also a committed surgical researcher ("75% clinical and 75% research" – his definition of a surgeon scientist). At Sunnybrook's Odette Cancer Centre, he partners with Arun Seth, a highly productive molecular biologist, studying prostate cancer genes. Together they have discovered a gene fusion that occurs specifically in aggressive prostate cancers and is expressed in circulating tumour cells. Rob was awarded the 2008 Medal in Surgery for this research; he delivered a guest lecture at the University of Western Ontario entitled, "Clinical Application of Prostate Cancer Genetics".

The circulation of shed tumour cells is a phenomenon that has been recognized for over 50 years. Curiously, there has been little progress on understanding this common phenomenon, or using it for diagnosis or prognosis. The Prostate Specific Antigen (PSA) test has been a disappointment as a screening test. It is insufficiently accurate, particularly at identifying the lethal forms of prostate cancer. In addition to over-diagnosing indolent cancers that have no clinical significance, the test is falsely negative in 25% – one in four patients with a normal PSA has prostate cancer. A better test is needed, since one third are aggressive cancers.

To identify new biomarkers for prostate cancer, Rob is exploring the effectiveness and tolerability of screening by biopsy. In a pilot study, 300 volunteers responded to an ad in *The Toronto Star*; fifty have been biopsied. The majority found this minimally invasive test well-tolerated, and would recommend it to a friend. The biopsy takes five minutes to perform and has a low complication rate. The tissue can be subjected to vigorous and detailed genetic analysis.

Rob is also looking at genetic polymorphisms in prostate cancers in their 4000 specimen tissue bank using gene chips. He continues to find novel genes for prostate cancer and aggressive prostate cancer in addition to the fusion genes that he and Arun have described. Arun has been studying the significance of genetic markers in breast cancer and Rob has extended these studies to prostate cancer.

Rob is a Toronto-born and trained surgeon from start to finish. His sister Diane Nam, an orthopaedic surgeon scientist, is described in a nearby article. His wife Yuna Lee is a general internist and physician educator at St. Michael's Hospital. They were married when Rob was in the Surgeon Scientist program developing his data base, tumour banks, and genetic studies. Yuna and Rob have two children; Matthew is 7 and Amy is 4. Rob is meticulously devoted to being home with his children by 6pm, and carries out his research between 9pm and midnight. They ski, golf and travel as their recreational activities. Grandparents on both sides have facilitated the careers of both parents.

Rob is grateful to Michael Jewett and Steven Narod, the Chair of the Breast Cancer program at Women's College Hospital, for launching his research career, and to Surgeon-in-Chief Robin Richards for his continuing support. Though there are many fellows and postdocs involved in the project, Rob has no urologic surgeon scientist in his program. The urology specialty committee of the Royal College discontinued allowing one year of residency credit for laboratory work, unlike many other surgery committees. Rob has participated in the leadership course of the Department of Surgery and was recently nominated by Robin Richards for the new Schulich one-year executive leadership course to be given to faculty members at Sunnybrook.

M.M.

Osteoimmunology and Fracture Healing

Diane Nam with Ava, Emma and Mark

Diane Nam is studying the effects of the immune system on fracture healing. Immunodeficient mice that lack T and B cells have significant alterations in the normal fracture healing pathway – inflammation followed by proliferation and remodeling. Immunodeficient mice, like immunodeficient humans, may fail to heal – developing partial or non-unions. This interesting area of osteoimmunology has important implications for fracture healing for all human patients, as five to ten percent of human fractures fail to heal satisfactorily. Cytokines associated with T cell function are altered in human patients with osteoporosis, diabetes, or those with immunodeficiency induced by chemotherapy, smoking, AIDS or trauma. "If we can use the immune response to improve the outcome in these patients, we may even be able to accelerate or guarantee union in normal patients. Immune modulators, which might be dietary supplements, T cell activators, or other pharmaceuticals may accelerate healing in normal patients as well as rescue, or strengthen those who are immunodeficient. Immune dysfunction is frequently observed after traumatic injury. Sunnybrook offers many opportunities to translate research findings into the clinical milieu."

Diane's clinical work is focused primarily on elective reconstructive surgery of the upper extremity and general orthopaedic trauma. Working with her colleagues Terry Axelrod and Robin Richards, she sees a great variety of upper extremity pathology. Diane has

75% protected time for research and 25% dedicated time for clinical work. In addition, she teaches medical students and residents. She took all of her training from medical school through fellowship at the University of Toronto. As a fellow with Terry Axelrod, she studied upper limb surgery. Her clinical work is performed at both Sunnybrook and at the Holland Orthopaedic and Arthritic Hospital. Her mentors during training include Nizar Mahomed who "sparked the orthopaedic interest during clerkship", Ben Alman for basic science training, and Terry Axelrod, who supervised her fellowship in upper extremity surgery. She was interested in research before entering medical school, earning a masters degree in pharmacology. Her father was an architect in Korea and her mother an accountant. Her parents and brother Rob, featured elsewhere in this issue, have been great supporters in her life and career. As a busy mother, she has little time now for music and the arts, though she is classically trained to play the violin. Diane is married to Mark, an attorney. They have two children, Emma, age 5, Ava, age 1. The children are frequently at their Uncle Rob and Aunt Yuna's house a stone's throw away, playing with their cousins Matthew and Amy or enjoying their uncle's gourmet barbecue cooking.

M.M.

Knowledge Creation and Translation at the Odette Cancer Centre

Frances Wright's practice of surgical oncology is focused on breast cancer and malignant melanoma. She is particularly interested in locally advanced breast cancer – those that are greater than five centimetres at presentation, invade the chest wall, or have fixed palpable axillary lymph nodes. She has recently finished a study to determine whether lumpectomy is feasible for these tumours following their shrinkage by chemotherapy. Restaging by MRI reveals that up to 20% become treatable by lumpectomy, rather than the standard modified radical mastectomy. This clinical study was spearheaded by Frances at Sunnybrook Health Sciences Centre and funded by the Canadian Breast Cancer Foundation, Ontario Chapter.

In contrast, tumours less than two centimetres in size at presentation are treated by lumpectomy and whole breast radiation. Brachytherapy – or partial breast irradiation – is only being offered as part of a clinical trial at the present time.

She is opening a trial in her busy melanoma practice wherein patients with positive sentinel lymph node biopsies will be randomized to node dissection versus follow-up by clinical examination and ultrasound every four months. Since only 20% of sentinel node positive patients will have further disease in their lymph nodes, the morbidity of node dissection might be delayed or

Frances Wright with Catriona, Brian and Declan

avoided if those who will not progress can be spared this treatment. Radiation is added after node dissection if the resected nodes are large. There is a 5-10% incidence of complications such as lymphedema or numbness in patients following axillary dissections. These complications are more frequent in those who undergo groin dissection.

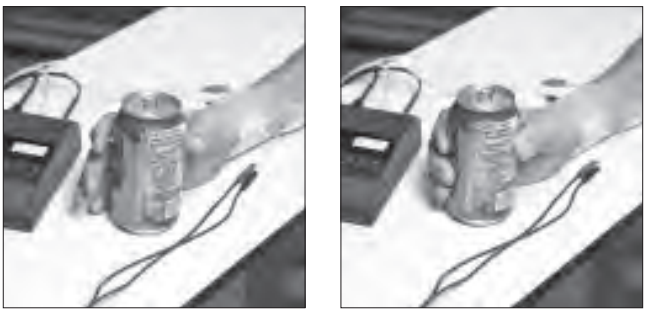
In addition to the clinical trials, Frances' research includes the study of knowledge translation, a significant focus of scholarship within the Odette Cancer Centre surgical oncology group at Sunnybrook – Andy Smith, Calvin Law, Anna Gagliardi, Natalie Coburn, and May Lynn Quan. Frances recently published a study demonstrating the effectiveness of opinion leaders in changing clinical practice. The impact of clear and persuasive communication of the need to sample twelve or more lymph nodes for accurate staging at the time of colectomy was foreshadowed in an article in the Winter 2006-

07 edition of the Spotlight. With Marcus Siminovitch in Hamilton, Frances has studied the practice of low and high volume surgeons performing pancreatectomy for cancer. Her qualitative interviews with surgeons were frank, revealing and constructive. Frances works with Cancer Care Ontario on the effect of multidisciplinary conferences on cancer management across the province. This work, under the direction of John Irish and Robin McLeod, supports the effectiveness of team care and the value of multidisciplinary planning at the outset of cancer treatment.

Frances was encouraged to pursue surgical oncology during her general surgery residency by Ross Walker at Queens. She received excellent guidance and training in qualitative research during her Masters degree program at OISE under Linda Muzzin. In her surgical oncology fellowship, she was supported and guided by Andy Smith and her current partners Calvin Law, May Lynn Quan and Peter Chu. She describes the oncology group as a highly collegial, supportive group that makes challenging work fun. Frances' husband is high school geography and science teacher Brian Roche. They have two children, 9-year-old Catriona and 5-year-old Declan.

M.M.

The New Face of Rehabilitation Research in Toronto



At Toronto Rehab, functional electrical stimulation (FES) is being applied in new ways. The pocket-sized device stimulates nerves and makes muscles move. After many repetitions, some patients actually "relearn" how to do basic tasks – without the device. A pilot study showed that people with partial paralysis from spinal cord injury who were injured up to two decades earlier could dramatically improve their walking abilities with FES. Another pilot study found that FES helped patients – even those with complete paralysis – to do things like pick up food or flip through a book. Coming next: a portable FES prototype for clinical and home use.

When **Geoff Fernie** came from the U.K. to Canada in 1973, rehabilitation science was in its infancy. Recruited by the Division of Othopaedics in U of T's Department of Surgery, he quickly saw what he had to do. "Orthopaedic surgeons at that time felt they were advancing surgery, but that the rehabilitation part was lagging," Dr. Fernie recalls. His role: to advance rehabilitation for the Department of Surgery, helping patients return to their daily lives after surgery.

As Dr. Fernie explained at Surgery Rounds in January, a lot has changed since those days. "Today, rehabilitation science is the emerging frontier in health research and Toronto is a world leader in this field." Engineering and computer science are a particular specialty in Toronto. In fact, the city has the largest rehabilitation engineering research group in the world and, arguably, the leading artificial intelligence group in computer science.

And a lot has changed for Dr. Fernie as well. He is Vice President of Research at the Toronto Rehabilitation Institute (Toronto Rehab), Canada's largest teaching and research hospital specializing in adult rehabilitation, complex continuing care and long-term care, and

Professor, Department of Surgery, U of T, with cross-appointments that include the Institute of Biomaterials and Biomedical Engineering, the Graduate Department of Rehabilitation Science and the Departments of Mechanical and Industrial Engineering, Physical Therapy and Occupational Therapy.

Combining two branches of medicine – surgery and rehabilitation – makes total sense to Dr. Fernie. "Surgeons and engineers come from the same mould. We tend to talk the same language because we're both faced with practical problems that we are required to solve. So our mindset, as well as skills, are very similar. And technology is a big part of our lives."

When surgeons and engineers work together, the potential for success is great, Dr. Fernie said. He cited a current collaboration between Toronto Rehab scientist Milos Popovic, an associate professor in U of T's Institute of Biomaterials and Biomedical Engineering, and the Department of Surgery's Andres Lozano, who pioneers deep brain stimulation. "Dr. Lozano has implanted stimulators in people and Dr. Popovic has been using the signals from those wires to enable people with disabilities to control the environment through a direct brain interface. Dr. Popovic is the first person in the world to do this."

The rapidly expanding field of rehabilitation is producing other exciting new treatments and technologies that are highly relevant to patients recovering from surgery. Take, for example, the advances Toronto Rehab is making with a technique that can stimulate paralysed muscles to work again. Functional electrical stimulation is being used in a new way to help restore reaching and grasping function in stroke patients. "Surgeons want to provide the best service to their patients, and advances such as these can help them do so," Dr. Fernie said.

Like all of us, surgeons are well aware of the needs of our aging population. "We are all getting older or have aging relatives who need the technologies we are developing," Dr. Fernie said. "All our lives, we've saved up for a house, a cottage, maybe a boat. And none of us want to swap that for 240 square feet in a nursing home." Scientists at Toronto Rehab are developing practical solutions to assist older people in day-to-day living and help them stay longer in their homes.

The focus is not only on physical issues. "Many of us know the worry of having a relative who is slightly confused, perhaps prone to wander in the middle of the night. You have to be with them all the time." Alex Mihailidis, a Toronto Rehab scientist and assistant professor of occupational science and occupational therapy at U of T, is working with colleagues on artificial intelligence systems to help older people "age at home". One project is the Talking Bathroom, which guides people with dementia through the task of hand washing and will eventually be able to guide them through a full range of washing and toileting activities. The Toronto Rehab-U of T team has also developed a personal emergency response system that can detect when a person has fallen and call for help. Speech recognition allows the system to ask questions and recognize different responses. The impact, Dr. Fernie predicts, will be huge for older people and their caregivers.

Toronto Rehab is also tackling the problem of caregiver injuries, so common in hospitals. Nurses are more likely than any other workers to be injured on the job, to miss work or to quit their jobs due to injury. So scientists at Toronto Rehab are developing high-tech lifting tools to help caregivers safely lift and move patients. One is the SlingSerter, which uses compressed air to effortlessly slide a sling under a patient. While the first users will be hospital staff, Dr. Fernie anticipates the SlingSerter will become popular with home-based caregivers as well.

Rehabilitation has something else to offer surgeons. "We have tools, such as sophisticated measurement systems, that can help surgeons solve some of their own research problems." These capabilities are increasing as rehabilitation research takes another leap forward: Toronto Rehab is building one of the most advanced rehabilitation research facilities. iDAPT (Intelligent Design for Adaptation, Participation and Technology) is an initiative to create an integrated network of research facilities where ideas can be cultivated, tested and applied in the real world, leading to practical new therapies and devices. One lab will house a giant motion simulator which can mimic everyday environmental challenges.

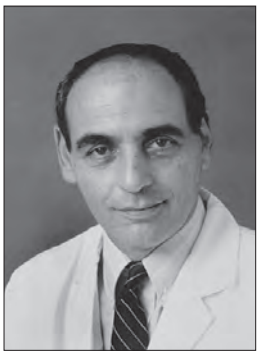
It's all part of the new face of rehabilitation research in Toronto, featuring innovation and collaboration to improve the lives of people everywhere affected by disability and aging.

Margaret Polanyi

FG Pearson - RJ Ginsberg Chair in Thoracic Surgery

Griff Pearson

Shaf Keshavjee was recently appointed the first occupant of the Pearson-Ginsberg Chair in Thoracic Surgery. The chair celebrates the accomplishments of F. Griffith Pearson and Robert J. Ginsberg, former chairmen of the university Division of Thoracic Surgery. Griff Pearson developed thoracic surgery as a defined field of study. His creativity, surgical talent and clear thinking led to the development of a school of thoracic surgery that has populated thoracic surgery divisions throughout the world. His defining characteristic, in the words of Shaf Keshavjee, is "the courage to do things that hadn't been done before and make them work. When I went to my first international meeting of the American Association for Thoracic Surgery as a resident, I was sitting among 2000 surgeons when I heard the moderator say from the podium, 'I wonder what Griff thinks about this? Griff, are you here?' That is when Griff Pearson's place in the world of thoracic surgery became clear to me. Not only is his name known to every thoracic surgeon, he always remembered everybody's name, even medical students who have been on his service."



Bob Ginsberg

Bob Ginsberg was an inspiring surgeon, bold and fearless in the quest of cure for thoracic cancers. Shaf describes his technical skill, clarity of thinking, organization and honesty in dealing with people as his defining characteristics. "He taught us all to respect the value of a multidisciplinary team, rather than focusing the treatment of cancer exclusively on the surgical component. He was instrumental in moving Princess Margaret Hospital to University Ave. – a lasting monument to his multidisciplinary vision. He organized his practice, his day, the Lung Cancer Study Group and especially his division at the Memorial Sloan-Kettering Cancer Institute in New York City as a model of how to run a tightly organized program. Both Pearson and Ginsberg contributed to the leadership of Toronto in the specialty, winning worldwide respect." The chair recognizes the foundational significance of the thoracic specialty within surgery. Donors showed their humility and generosity, reflecting that of Pearson and Ginsberg, in their willingness to contribute to recognize someone else's name. Bob Ginsberg's schoolmate and friend Lionel Robins, former Chair of the Princess Margaret Hospital Foundation board, spearheaded the fundraising. David Ginsberg, Bob's son, was a significant donor, as were the members of the Division of Thoracic Surgery. The chair strengthens the academic activity of the division, allowing original research on innovative projects. It will make the position of Chairman of Thoracic Surgery attractive to outstanding candidates for years to come, enabling us to attract and keep top talent.

Shaf Keshavjee

In addition to the Pearson-Ginsberg Chair, Shaf Keshavjee has won the Colin Woolf Award in recognition of his contributions to Continuing Medical Education. He believes that the education of fully-trained surgeons is as important as that of residents and fellows. "It's the 35th year of the Thoracic Surgery Refresher Course, so the credit is certainly not mine." Ten years ago the course was nearly cancelled under the press of other responsibilities among the faculty. Shaf rescued it and kept it going as the longest running and most respected course of its kind. The style of the conference is casual and friendly, with open discussion with audience members. It perpetuates the spontaneous culture of scholarship that Griff Pearson created and its attendees carry this back with them to their practice venues.

The Lister Award, the highest honour in our department for research, was also earned this year by Shaf. His deconstruction and remediation of ischemic lung injury is a stellar example of using the unique position of the surgeon scientist to take surgical problems to and from the laboratory to solve a clinical problem. "It has been a thrill to see two moments of great progress in lung preservation. When I entered the lab, cold, static immersion was the mode of preservation of donor lungs, bringing on the worst reperfusion injury imaginable." Shaf developed low-potassium dextran solution, (1) which has subsequently become the world standard for lung preservation. The technique was accepted by an imaginative faculty, including Joel Cooper,

Alec Patterson and Mel Goldberg. The more recently developed ex vivo lung perfusion technique allows assessment of function of the human lung outside the body and the possibility to apply reparative techniques to improve the function of lungs that would otherwise not be considered suitable for harvest. (2, 3) This work is the culmination of 15 years of collaborative work in the laboratory by previous research fellows: Andrew Pierre, Stephen Cassivi, Stefan Fischer, Jonathan Cardella, Narcelo Cypel and Jonathan Yeung and the scientific mentorship of Joel Cooper, Alec Patterson and Art Slutsky. Shaf learned relentless perseverance in research from Joel Cooper. "His tireless, indescribable energy and brilliant intellect sets an admirable example and certainly shaped my career." Alec Patterson, a technically superb, humanistic, and remarkably easy-going surgeon, was another role model. Art Slutsky was a scientific mentor for Shaf's MSc thesis and the development of his independent career as an investigator, teaching him how to navigate the complexities of academic life. Bryce Taylor, a very important mentor to Shaf and his wife Donna McRitchie, has been a supporter from medical school through the present day. Donna is the head of General Surgery and Critical Care at North York General Hospital and the Chair of the Medical Advisory Committee. Their daughter Sara is in grade six at Havergal College. Their dog Data is a retired guide dog and her constant companion. Shaf takes pride in the six-member team of thoracic surgeons at the University Health Network, all of whom are friends and highly-productive and respected leaders in the specialty. He is helping St. Joseph's Hospital and Toronto East General develop into level one thoracic centres.

M.M.

(1) Keshavjee SH, Yamazaki F, Cardoso P, McRitchie DI, Patterson GA, Cooper JD. A Method for Safe 12 Hour Pulmonary Preservation. *J Thorac Cardiovasc Surg* 1989; 98:529-34.

(2) Cypel M, Yeung JC, Hirayama S, Rubacha M, Fischer S, Anraku M, Sato M, Harwood S, Pierre A, Waddell TK, de Perrot M, Liu M, Keshavjee S. Technique for prolonged normothermic ex vivo lung perfusion. *J Heart Lung Transplant.* 2008 Dec;27(12):1319-25

(3) Martins S, DePerrot M, Imai Y, Yamane M, Quadri SM, Segall L, Dutly A, Sakiyama S, Chaparro A, Davidson BL, Waddell TK, Liu M, Keshavjee S. Transbronchial administration of adenoviral mediated interleukin -10 gene to the donor improves function in a pig lung transplant model. *Nature Gene Therapy* 2004 Dec; 11(24):1786-96.

NEW STAFF

Toni Zhong

Toni Zhong is our newest recruit to the Division of Plastic and Reconstructive Surgery and Department of Surgical Oncology at the University of Toronto. She has recently joined the Oncologic Reconstructive Program at the Toronto General Hospital. In addition to her clinical interest in all forms of complex reconstruction post-oncologic ablation and treatment of difficult cutaneous malignancies, the overriding goal of her clinical practice is to help establish the Breast Restoration Program at UHN under the leadership of Stefan Hofer, the Chief of Plastic Surgery at UHN.

Toni is a graduate of the Plastic Surgery Residency Training Program at the University of Western Ontario and became a Fellow of the Royal College of Physicians and Surgeons of Canada in 2007. During her residency, Toni won numerous national and international research awards including the Young Investigator Award at the World Transplant Congress for her work on the development of limb transplantation in a mouse model (2006), the Elsevier Canada Research Award (2006), the F.M. Woolhouse Award presented for the best clinical paper presented at the Canadian Plastic Surgery Meeting (2004), and the PSIF Prize for the most outstanding resident research papers in Ontario universities (2005). She was also a recipient of numerous research grants, including the PSIF Resident Research Grant (2003), Canadian Hand Society Research Grant (2004), and Synthesis craniofacial grant in Paediatric Plastic Surgery (2007). Following the completion of her residency, Toni was awarded the prestigious Zeiss Canada Microsurgery Scholarship to pursue a year-long Microvascular and Reconstructive Surgery Fellowship at Memorial Sloan Kettering Cancer Center in New York City.

Toni hopes to contribute to the long tradition of academic excellence and innovation within the Division of Plastic and Reconstructive Surgery at the University of Toronto. To complement her clinical practice in the field of reconstructive surgery, she is currently pursuing

her Masters of Science in Clinical Epidemiology at the Harvard School of Public Health. Her research areas of interest include the development of validated patient-reported outcome instruments designed to evaluate health-related quality of life following specific breast surgical procedures and the identification of barriers to access of care especially as it pertains to breast reconstruction.

Stefan Hofer
Division Head, Plastic Surgery, UHN
Wharton Chair in Head and Neck Reconstruction

Andrew Dueck joined the University of Toronto, Division of Vascular Surgery and the combined Cardiac and Vascular Division at Sunnybrook Health Sciences Centre on October 1st 2007. Andrew did an undergraduate degree in Cell Biology at the University of Waterloo prior to completing his MD at Queen's University. During medical school at Queen's he distinguished himself with numerous scholarships. His interest in surgery combined with his scholarship and surgical potential was demonstrated early as he was the winner of the Dr. Osler Briggs Dickinson Scholarship for outstanding performance in surgery. After graduation he began a residency in General Surgery at the University of Toronto, during which he was awarded a CIHR fellowship to complete a Masters of Clinical Epidemiology on Aortic Aneurysm Care in Ontario with joint supervision from Daryl Kucey (Vascular Surgery) and Andreas Laupacis. His research presentation at the Canadian Society for Vascular Surgery resulted in his winning the Blair/Gore Award. Three major publications in the *Journal of Vascular Surgery* detailed his analysis of AAA care in Ontario. During the successful completion of his residency in General Surgery and a two-year residency in Vascular Surgery, his contributions to teaching were recognized. He won a Harrison teaching award at Sunnybrook and Paddy Lewis Award for excellence in Postgraduate teaching at University Health Network. During his Vascular Surgery training he worked with Douglas Wooster on barriers to AAA screening. His presentation "Fishing for BASS: Surveying Primary Physicians in the Barriers to Aortic Screening Study" was awarded the Society for Vascular Ultrasound's Dr. Alex Chao Young Investigator Award. After the completion of his Royal College Vascular training, Andrew sought advanced training with a fellowship in Endovascular Surgery and Peripheral Interventions at the Arizona Heart Hospital with Ted Diethrich before returning to Sunnybrook.

Andrew's research interests are in novel imaging techniques in vascular disease. He has been busy since he returned to the Division of Vascular Surgery starting research projects, raising funds for the endovascular program at Sunnybrook and becoming the Tariff Chair for the Section of Vascular Surgery at the Ontario Medical Association. Andrew is also has a passion for landscape and architectural photography in his spare time. Andrew's partner, Deborah Neill has a PhD in History from the University of Toronto and is an Assistant Professor in the Department of History, School of Arts and Letters at York University. Most recently they have become proud parents of Claire Robin Dueck who was born November 28th 2008.

The Division of Vascular Surgery is delighted to welcome Andrew to the Department of Surgery at the University of Toronto.

Thomas Lindsay MDCM FRCS FACS
Professor and Chair, Division of Vascular Surgery

Checklists, Guidelines, Standards and Rules

Martin McKneally

At the time that the checklist story broke in the *New England Journal of Medicine* and international media in January, I was involved in a spirited online writing group setting standards for cardiothoracic surgeons. Like the orthopaedic surgeons described in our article on page 5 on the conflict of interest debate, members of my specialty are receiving increased attention to their financial relationships with manufacturers of expensive intracardiac devices such as valves, pacemakers, defibrillators and pumps. As we developed our recommendations, we were concerned about the tone and the level of forceful persuasion that would be appropriate. The ethics committees of our two specialty societies were put to work.

Should they be **guidelines**? Somehow this seemed too slack. A nautically inclined physician-lawyer-ethicist in my Practical Ethics class gave a helpful explanatory definition. Guidelines were originally ropes that ran from the bow to the stern when boats were less safe and seamen were at greater risk of being swept off the deck in rough seas. They could seize the guideline to save themselves from washing overboard. The coercive enforcement was by common sense rather than mandate. Guidelines are helpful, but they aren't mandatory.

After some discussion, libertarian arguments in our surgical group gave way to a consensus that we would set professional **standards** for managing conflicts of interest. Such standards are enforced by collegial opinion within the community. However, because they are codified and referencable as standards, they can be used in a court of law against a professional who does not comply with them.

The checklist that was introduced into the operating room at Toronto General is a policy instrument. Enforcement of its use is coerced by peer pressure, a form of soft power (1) toward the accomplishment of an aspirational goal of complete compliance. Similarly, Jack Cronenwett's policies adopted at the cooperating vascular surgery sites of the Northern New England Group (see page 8) depends on peer respect, collegiality and loyalty to an enterprise undertaken by consensus in a voluntary group of professionals. By definition, professionals are self-regulating because their arcane skills and knowledge are not readily susceptible to external regulation by non-professionals in the community, the institutional administration or the government. As our electronic discussion group developed what we initially characterized as guidelines, we worried that non-compliance by some of our members might incite eloquent exposés in the news media, resentment in the community, and more rigorous enforcement through government regulation. Conflict of interest issues in banking, finance, medicine and surgery are moving community opinion toward requiring regulation with the force of law, particularly in the United States where Senator Grassley of Iowa is threatening to file criminal charges against orthoapedic surgeons for taking kickbacks to influence institutional choices of expensive prosthetic devices.

Returning to the World Health Organization checklist, Bryce Taylor draws an accurate analogy to automobile seatbelts. Once their safety was proven, their use had the moral force of guidelines. As further evidence developed through the Cornell crash survey and other scholarly evaluations analogous to the WHO checklist project, their use became a standard, and now in many jurisdictions it is enforced by the rule of law. Just as we owe a debt of gratitude to the trauma surgeons who demonstrated the lifesaving value of automobile seatbelts, we owe a debt of gratitude to our WHO researchers, including our Toronto team of Bryce Taylor, Anne Slater and Richard Reznick for developing the proof that will eventually make the checklist the standard of practice for surgical patients and operating teams.

Martin McKneally
Editor

(1) Nye, Joseph S., Jr. Soft Power. *Foreign Policy.* 1990;80: 153-171.

HONOURS/AWARDS/ ACCOMPLISHMENTS

Karen Davis (NeurSurg) has been appointed Associate Director, Institute of Medical Science effective January 1, 2009.

Michael Fehlings (NeurSurg) was the celebrated researcher at the 2008 American Association of Neurological Surgeons Annual Meeting in Chicago which was highlighted in the 2008 AANS Annual Report.

Geoff Fernie (Research) has been inducted into the Terry Fox Hall of Fame.

Shaf Keshavjee (ThorSurg) is 2007-2008 recipient of the Colin Woolf Award for Excellence in Long-Term Contributions to Continuing Medical Education.

Andres Lozano (NeurSurg) has been awarded the 2008 Jonas Salk Award from the March of Dimes Canada for his work in stereotactic and functional neurosurgery.

Glenn Regehr (Research) has won the 2008 Award for Outstanding Achievement in the Evaluation of Clinical Competence by the Medical Council of Canada.

Jim Rutka (NeurSurg) was chosen as November's Researcher of the Month by the Ontario site of the Canadian Cancer Society.

Charles Tator (NeurSurg) has been elected to the Canadian Medical Hall of Fame.

Michael Taylor (NeurSurg) has been elected to the Advisory Board (Neuro-oncology) of the journal Child's Nervous System.

Mitesh Badiwala (CardSurg Resident) has recently received a number of awards: the Starr Medal, and the Joseph M. West Family Memorial Fund Award, both from the Faculty of Medicine, University of Toronto; the Bigelow Book Prize, from the Cardiovascular Sciences Collaborative Program, University of Toronto; and the Canadian Cardiac Transplant Network Research Award at the Canadian Society of Transplantation Annual Meeting in Banff, Alberta. He was also a Basic Science Student Presentation Award Finalist at the Canadian Cardiovascular Congress in Toronto.

Ratan Bhardwaj (NeurSurg Resident) won the second place Horsey Prize for his research entitled "Unique functional pathway detected with MEG and DTI tractography in pediatric epilepsy".

Betty Kim (NeurSurg Resident) has successfully defended her PhD in the Institute of Biomaterials and Biomedical Engineering. Her thesis was entitled "Enhancing the Intracellular Delivery of Engineered Nanoparticles for Cancer Imaging and Therapeutics".

Nir Lipsman (NeurSurg Resident) received first place for the Horsey Prize with his presentation "Personal identity enhancement in Neurosurgery".

Ryan Neinstein (PlasSurg Resident) has been awarded the Outcome Study Grant from the Educational Foundation of the Canadian Society of Plastic Surgeons for a study looking at the effect of breast reduction on markers of insulin resistance (supervisers James Mahoney, Melinda Musgrave and Joel Ray). Further funding has been obtained through a grant from the Physicians' Services Incorporated foundation.

Adrienne Weeks (NeurSurg Resident) received an NCIC Terry Fox Foundation Post MD Research Fellowship Award for her work on "The Role of the Guanine Nucleotide Exchange Factor, ECT2, in Glioma Invasion, Migration and Tumourigenicity".

GRANTS / FELLOWSHIPS

Michael Fehlings (NeurSurg) was awarded two grants from the Spinal Cord Injury Solutions Network / Rick Hansen Foundation for his work on: 1. "From research to clinic, the translational step with functional magnetic resonance imaging of the human spinal cord; and 2. "Economic evaluation of early surgical decompression for traumatic cervical spinal cord injury".

Michael was also selected to receive the "Outcomes Award" from the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves for his paper entitled "Key predictors of outcome in patients undergoing surgical treatment for cervical spondylotic myelopathy: Analysis of a prospective multicenter study in 285 patients with a 1 year follow-up".

Michael also received an award from the Cervical Spine Research Society for his project entitled "Economic impact of early surgical decompression after traumatic cervical SCI: Cost-effectiveness and cost-utility analyses using Ontario-based health costing data".

Paul Marks (OrthSurg) with co-PI Caroline Hoemann, Ecole Polytechnique, Montreal, have received a strategic NSERC grant of $450,000 over 3 three years for their study entitled "Restoration of joint function through subchondral delivery of therapeutics".

Markku Nousiainen (OrthSurg) has received the 2008 Canadian Orthopaedic Research Legacy award, sponsored by Angiotech, for his project entitled "Training femoral neck screw insertion skills to surgical trainees: Computer assisted surgery versus conventional fluoroscopic technique".

Mitesh Badiwala (CardSurg Resident) has been awarded the Edward Christie Stevens Fellowship and the Chisholm Memorial Fellowship, both from the Faculty of Medicine, University of Toronto.

Gregory Hawryluk (NeurSurg Resident) received a Resident/Fellow grant from the Cervical Spine Research Society for his work entitled, "Defining neural precursor cell-host interactions to optimize repair of traumatic spinal cord injury".

CHECKLIST *continued from page 2*

door near the clock in a big plasticized sign." The post-intervention phase went well as the fellows and nurses were all accustomed to the use of the checklist. Resident turnover was somewhat of a confounding variable. The nurses liked the system; they felt it built team spirit. Some surgeons ran through the checklist as a humourous skit and a fun way to introduce new people in the operating room. Though there were some resisters, no annoyance was detectable. "Though the list looks big, it takes only 2-3 minutes to fill out." The patients felt safer and were pleased that the checklist was in place. Anne's background as a research nurse working with Steve Wolman at Toronto General proved excellent preparation for this project. She was familiar with checklists used in aviation as her father was a pilot and her son Mike, an army captain in armoured reconnaissance is also a pilot. Anne serves as an executive assistant to Richard Reznick in his role as Vice President, Education at UHN. She manages a broad portfolio, orchestrates multiple teleconferences, helps in the clinic and manages novel initiatives such as the checklist project. Anne is married to Michael, an executive chef. Like most surgeons, she is a morning person, hitting the gym at 6:30 each morning when she is not in the operating room. She runs half marathons and skis. In addition to its usefulness, she found the checklist project stimulating and fun.

Let's be the first department in Canada to integrate the checklist as an essential element of training and care at all of our hospitals.

M.M.

(1) Hayes AB, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *New England Journal of Medicine* Jan. 29, 2009;360(5):491-499

(2) Lingard L, Regehr G, Orser B, Reznick R, et al. Evaluation of a Preoperative Checklist and Team Briefing Among Surgeons, Nurses, and Anesthesiologists to Reduce Failures in Communication. *Archives of Surgery.* Jan. 2008;143(1):12-17.

The deadline for the Spring 2009 Surgery Newsletter is April 1, 2009.
All members of the Department are invited to submit news items, articles, pictures, ideas or announcements. You may reach us by:

voice mail: **416-946-8084, fax: 416-978-1911 or**
e-mail: **julie.roorda@utoronto.ca**.

Please provide your name and telephone number so that we may contact you if we have any questions.

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