

The Surgical Spotlight

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

WINTER 2007-2008



The Department of Surgery Celebrates the Holidays

On December 6, two hundred adults and sixty children gathered at the Acqua Ristorante to celebrate our Department's best-attended holiday party ever. The kids were thrilled with their gifts -- thanks to Santa's delegate Anne Wiley. The Webkinz were a big hit. Thanks also to Sylvia Perry and Cheryl Reznick for organizing a memorable event.



Michel and Gabrielle Adamina with Cheryl Reznick holding baby Oriane Adamina (right to left) at Acqua

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Santa's helper Nicholas Backstein distributes gifts to good girls and boys. Gift packages were created by Anne Wiley. (Santa was unable to participate -- see story on page 23.)



Deborah McKneally (left), Lisa and Tom Waddell with children Harrison and Alexandra



Dancing Family: Dee Ballyk (*Anatomy-left*) and Jim Graham with children Evelyn, Isabel and Nicholas Graham

The Network of Excellence in Simulation for Clinical Teaching and Learning: Rocket Fuel for our Academic Activities in Simulation

In the past year, the Faculty of Medicine, in conjunction with the Michener Institute, the Faculty of Nursing, and other Ontario partners have petitioned the Ministry of Health for assistance in the development of a Network of Simulation for Clinical Teaching and Learning. The result has been the receipt of a \$4,900,000 grant to make this network a reality. This is a great boost for the University of Toronto and its network of partners as we move forward to capitalize on the significant potential of simulation and position our institution in the forefront of scholarship in this area.



Richard Reznick

SIMULATION: AN AMAZING FUTURE

I am confident that if one were to pick one dominant trend that will have a profound effect on learning in the next decade, it would be what lies ahead in the field of simulation. Simulation is a constellation of techniques that range from very basic activities, such as a young medical student learning how to do a history and physical examination through engagement with a standardized patient to more sophisticated learning, such as a surgical resident learning a complex procedure through practice in a virtual reality environment that mimics the real world. What characterizes the most important strategic advantage of simulation technology is the provision of opportunities for deliberate practice. Anders Eriksson is likely the most influential motor psychologist of the last 30 years. He has pointed to deliberate practice, the effortful activities designed to optimize performance

as the essential route to expertise. Deliberate practice implies repetition of a task, coupled with feedback from an expert coach. What distinguishes these activities from most types of surgical practice, is the ability to make mistakes, analyze these mistakes, and then, with guidance, develop a program of continuous improvement measured against established benchmarks.(1)

There is a breadth of simulation activities going on in our Department. In our Surgical Skills Centre at Mt. Sinai Hospital we have augmented our focus on surgical simulation. Over the last five years we have purchased an increasing number of sophisticated virtual reality simulators and are shifting our focus from activities that used to be centred on “low-level” simulation to one that now embraces the ever-increasing sophistication of modern day simulators.

THE MARKET PLACE MAY END UP BEING THE STRONGEST BOOST TO SIMULATION

In truth, we are really in the embryonic stages of simulation technology developing into a vital part of our daily teaching enterprise. As computing power augments exponentially, as web-enabled technologies reach an entire generation and as the cost of technology diminishes, we can expect dramatic changes in the way we train and of the role of technology in training. Current estimates suggest simulation will be a 4B industry by 2013. Frost & Sullivan's study suggests a 6 month return on investment for medical simulation. As well, current estimates are that time spent on a simulator is 20% as effective as time spent in the O.R. This compares with a current figure of 80% for the airline industry. The implication is that there is great room for growth as investment capital fuels further development.

A STRONG BASE TO BUILD ON

Dale Dauphinée, a respected Canadian academic, has spent the last 8 months in Toronto as the Interim Director of the Network, putting the pieces of our future operation into play. Part of Dale's work is to analyze the extent of activities going on at the University of Toronto as the base from which to grow our network. In addition to our Skills Centre, we have a sophisticated Standardized Patient Program that has, for over a decade, been involved in teaching, assessment and research at an international level. Our Nursing Faculty boasts a state of the art simulation laboratory aimed at teaching novice

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nurses skills needed for procedures, resuscitation, and a broad range of other technical and cognitive skills. For decades our anaesthetic colleagues have pioneered research in the use of simulation to both train anaesthetists and promote a focus on the safety agenda of anaesthetic care. We are actively practicing telesimulation. Our colleagues at St. Michael's Hospital are developing an institute in which simulation will play a vital role. We have a heightened involvement in patient safety initiatives enabled by simulation. Our surgical group is involved with the National Research Council of Canada which recently received a large grant from Industry Canada to promote technological innovation in simulation. We now have a natural alliance with engineers, mathematicians and computer scientists, all aimed at developing medical simulations as a practical, cost effective and progressive tool. And progressive it will be. We are just around the corner from a very new paradigm. Just picture a PGY-3 surgical resident who has already spent hundreds of hours in a technical skills laboratory, who has become accustomed to the team culture in the operating room through moulage activities, who has achieved many technical benchmarks through simulators and is now preparing for tomorrow's operation. Instead of reading a technical manual, he or she will now prepare for the operation by downloading patient specific data into a simulator and practicing the conduct of the case repeatedly, with the team. The simulator will have haptic feedback-- it will provide a realistic sense of touch during palpation of tissues and it will bleed when incised.

CAPTURE THE MOMENT

Our academic focus on simulation has provided us with the opportunity to apply for, and receive, substantial funding to further our agenda. It is now our responsibility to capture the moment and put this money to good use. We are currently putting together a business plan and a governance structure for the Network. We anticipate, because of our past successes and current talent, that Surgery will factor prominently in the Network. In my opinion, the most strategic element for success will be a coordinated effort to break out of our silos and bring the richness of talent to the table. This includes our hospitals, our health science faculties, our industry partners, our Departments in the Faculty, and our educational institutes.

(1) Ericsson KA, Krampe RT, Tesch-Romer C. The Role of Deliberate Practice in the Acquisition of Expert Performance. *Psychological Review*: 100: 363-406: 1993

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

What are AFPs and why do we need them?

WHAT ARE AFPs?

"An AFP provides an alternate approach to funding physician services other than fee-for-service. An AHSC AFP is an agreement between physicians, affiliated hospitals, the university, the Ontario Medical Association and the Ministry of Health and Long-Term Care. The scope of services, deliverables, decision-making, reporting and accountability structure are defined within the agreement."

Ontario Ministry of Health and Long-Term Care

The Alternate Funding Plan (AFP) aims to stabilize human resources at Academic Health Sciences Centres (AHSC) in Ontario. 85% of physicians working in the province, the majority of them providing care in community hospitals, were trained in AHSCs in Ontario. Because of time spent teaching medical students, residents and fellows, there may be income discrepancies between specialists working at an AHSC and physicians in the same specialty working at a community hospital. Time spent doing research, which is poorly remunerated compared to clinical work, further accentuates the difference. The Government of Ontario, recognizing this discrepancy for the first time, has allocated \$225 million in new funding to promote the retention and recruitment of academic physicians. This funding includes \$40 million for teaching, \$20 million for research, \$10 million for recruitment of new academic physicians, and \$140 million to close the income gap between physicians working in academia and in the community. This latter funding is called "clinical repair" (of the gap). Recognizing also that many advances in health care commonly take place at AHSCs, especially in terms of basic research and innovations that affect health care on a large

scale, the MOHLTC will provide \$10 million to support the development of innovation in health care delivery. An additional \$5 million will be allocated to defray the administrative costs associated with implementing the province-wide academic AFP.

HOW SHOULD AFPS BE IMPLEMENTED?

The Ministry and the OMA endorsed the creation of governance at each AHSC site comprising representatives of a doctors' organization, the university and the hospitals. Each has veto power over what happens, but the board that provides day-to-day operation is heavily physician-based. Barry Rubin is Chair and CEO of the Mount Sinai Hospital - University Health Network Academic Medical Organization, which represents about 700 physicians at MSH and UHN. All save one specialty group are participating. This organization has distributed more than \$100 million to physicians at MSH and UHN over the last 4 years. When the next phase of the AFP agreement is signed in 2008 it will be responsible for allocating about \$125 million per year to physicians at MSH and UHN.

In total the MOHLTC has allocated \$225 million plus \$5 million for administrative infrastructure. Administrative costs for accounting and documentation are less than one percent of the total that has been distributed. The system at MSH - UHN is cost-effective because it is partnered with a level one bank to distribute funds and information electronically. The 700 physicians represented are organized into 57 billing groups within 24 practice plans. The governance organizations only have relationships

"I think Phase III of the AFP represents a significant step in the evolution of a physician funding system that will enable the retention and recruitment of physicians at Academic Health Science Centers in Ontario. No other jurisdiction in Canada has implemented such a comprehensive funding initiative, which recognizes the unique contributions made by academic physicians, and which adheres to the bedrock principles of transparency, accountability and strong local Governance."

*Barry Rubin
Division of Vascular Surgery*



Chelsea, Penny, Blake, Barry and Shelby Rubin (left to right)

with practice plans, not with individuals. Practice plans maintain complete, unambiguous and total autonomy with respect to allocation of funds received -- a bedrock principle of the governance organization.

When the organizing committee for MSH - UHN came together, all of the different groups of physicians recognized two things: first, it was beneficial to work in a collegial environment if every department got some "clinical repair income" out of the program; second, if every major group didn't agree, the whole deal might not go through. So one criterion was that all of the major groups -- medicine, surgery, anaesthesia, psychiatry, obstetrics, emergency, and family medicine -- had to participate to the extent that 80% of clinical activity in each department was represented. Every department would get some clinical repair. The result was that members of the organizing committee were able to come to a unanimous agreement on a methodology to allocate Phase III AFP funds. It is anticipated that every full-time equivalent participating in Phase III of the Provincial AFP at MSH and UHN will be allocated a minimum of \$45,000 per year when Phase III of the AFP is implemented - likely in March or April 2008. Practice plans will determine how these funds are allocated to individual physicians. In addition, some specialties will be allocated up to an additional \$75,000 per FTE per year.

To agree to supply this level of funding, the MOHLTC has imposed conditions, most importantly accountability. Participants must be able to tell the MOHLTC how the money was used on a per physician basis. Practice plans can do what they want, but they must tell the Ministry who received the funds. Both the MOHLTC

and the OMA want to ensure that Phase III AFP Funds are allocated to doctors, not infrastructure, debt-service or non-physician human resources. Under this agreement, a decrease of > 10% in the clinical service that a group of physicians has provided in a given year will trigger a dialogue between the MOHLTC and the AHSC governance organization about the reasons for the decrease. This can lead to financial penalties that are proportional to the clinical repair funds received by a given group, i.e. if clinical services decrease 20%, clinical repair funds could be decreased by 20%. It is important to emphasize that penalties can never affect OHIP billing. Furthermore, every physician is free to abstain from this agreement, or to withdraw from the agreement at any time.

One unforeseen challenge concerns the tension between universities and clinical practice plans. A significant amount of funding for teaching and research flows through the governance organization, but the university still maintains primary responsibility for providing teaching. The challenge is to align teaching funding with the people in practice plans who are doing the teaching. The same applies to research. The MSH - UNH organization is working with the University and the Clinical Chairs to try to implement mutually acceptable methodology for the internal redistribution of Phase III AFP teaching and research funds. [see box for an alternative principle espoused by Chairman Reznick]

Barry is a full time academic surgeon with a full time clinical referral practice and funding for basic research from CIHR. He does “50% research, 50% clinical and 50% administration”. The AFP job currently takes about two full days a week, sometimes more. He was a member of the provincial task force that developed the plan, chaired the committee that developed the definition of a full-time equivalent that is used to distribute the clinical repair funds, and was a member of the template-drafting group that wrote the actual contract. He is the provincial lead representing all the governance chairs in discussions with the MOHLTC and the OMA. He organizes a conference call among all the governance chairs in Ontario once a month to keep the group apprised of developments. This has become a very important body in dealing with the MOHLTC and the OMA. When the governance chairs speak with one voice, they represent more than 4000 academic physicians. Their highly developed

infrastructure is able to disseminate information quickly to physicians and respond to their needs in an efficient and effective manner.

Recognizing that there are administrative aspects of this job for which he had little experience, Barry has taken courses at the Rotman School of Management and at the Kellogg School of Management at Northwestern University. Courses on negotiation, leading high impact teams and accountability in the boardroom have taught him a great deal about cultural diversity and how institutional culture affects the way individuals work in a team environment. Some of the techniques he has learned and applied have proven helpful to the management committee.

Barry has been married for seventeen years to Penny, who enables his success in all his different jobs. Their three children are Chelsea, 16, Blake, 13 and Shelby, 10. Barry protects weekends to spend with his family. “We try to eat together always, even if it is late.” The family will vacation in Cuba this winter.

M.M.

Barry's letter about AFPs, written to Ontario's Minister of Health George Smitherman is available at www.surgicalspotlight.ca

“For the first time in its history, the Government of Ontario has acknowledged the importance of including monies dedicated to supporting teaching and research as part of its AFP process. The numbers are meaningful, \$60,000,000 across the province. It is imperative that academic leaders set into motion safeguards that will ensure that these monies are indeed spent to support our academic mission and that an accountability framework be established to assure that this money is well spent. In my opinion, simply spreading out this money on a per FTE basis is poor planning that will not serve our academic mission well in the long run.”

Richard Reznick

Surgical Judgement:

SUMMONING COGNITIVE RESOURCES



Carol-anne Moulton

Carol-anne Moulton's MEd research focused on how we teach technical skills to residents, comparing "massed practice" -- teaching skills all at once in an intensive course -- to "distributed practice" -- training a little bit each week. The distributed practice worked better. An interest in surgical judgement was fostered during the time she

spent in the Wilson Centre with frequent impromptu discussions with Glenn Regehr and Helen MacRae. Judgement has become the focus of her doctoral research. She feels that we can improve the way surgical judgement is taught. Because they make decisions at 600 mph, fighter pilots in training spend 15 hours in preparation and debriefing for every hour in flight. From both an operational and a teaching point-of-view, it would be valuable to both residents and faculty to spend more time on preoperative mental rehearsing, imaging and planning, and to debrief postoperatively.

To improve teaching surgical judgement, we must first understand it, so Carol-anne became interested in deconstructing what is actually meant by the term. Surgeons use many words -- decision-making, clinical reasoning, problem-solving, judgement, clinical acumen and intuition -- to describe what they are actually doing when they are making the right decisions for their patients. The surgeons she has interviewed find it difficult to describe what they mean by good surgical judgement, but they know it when they see it in a surgical resident.

In order to deconstruct what it is that surgeons "see", she observed hepatobiliary surgeons in the operating room. She concludes that it comes down to "the moment of slowing down when you should", a metaphor for focusing, for summoning additional cognitive resources. She is currently interviewing surgeons about what they experience in those "slowing down" moments when there is a transition from automatic to effortful mode.

Part of slowing down when you should is recognizing that there is an issue to be addressed, what Carol-anne calls "situation awareness". There are three levels of situation

awareness: one, perception of stimuli (radar blips); two, understanding the stimuli (enemy planes); and three, projection of what this will mean in the future (call for help). Decision-making follows this picturing of the environment. A bad decision is often the result of having a poor picture of the environment, rather than poor decision-making skills. Most errors in the aviation industry are not decision-making errors, but errors in situation awareness.

Carol-anne observes that we usually don't allow residents to reach that uncomfortable feeling when there is a problem, through their own situation awareness. Instead of allowing residents to slow down and work things through, faculty often override trainees' misreading of the environment to speed them up. Residents don't always see the same cues, but if faculty surgeons are more explicit about what cues they are reading, residents will have more of an opportunity to learn situation awareness. You are more likely to become aware of cues that you anticipate.

The capacity to slow down when you should is not necessarily something that comes with expertise. A resident may have the capacity while a faculty member does not. Carol-anne defines expertise as a process of engaging in your environment and effortful reflection, rather than achieving a certain status or level. By deconstructing what is meant by judgement, it might be possible to evaluate and remediate when judgement is lacking. She is working with cognitive psychologist Glenn Regehr, qualitative analyst Lorelei Lingard, and surgeon Helen MacRae.

Carol-anne was born in Canada, but moved to Australia with her parents in Grade 11. She joined the staff at Toronto General Hospital as a hepatobiliary surgeon in September 2006. She finds the system in Toronto quite different from her experience as a trainee in Australia where the emphasis was almost exclusively clinical. She completed her MD at Melbourne University and surgery residency at the Austin Hospital in Melbourne. Her academic work began in Toronto during a fellowship in 2003. From 2004-2005 she did a Masters in Education with Richard Reznick; she began work on her PhD in 2006. She has three children, Jackson, 5, Connor, 3 and Kennedy, 1. Her husband Daryl is currently a full-time dad, enabling her to be at work at 7am when needed. Carol-anne and her colleagues Sean Cleary, Alice Wei and Steve Gallinger have created a group practice with a "one in four" call system, in which each does intensive clinical work for one week and research for three.

M.M.

The Spine Program at UofT

Raj Rampersaud completed orthopaedic surgery residency and a spine fellowship at the University of Western Ontario. He studied neurosurgery (spine) in Memphis with Kevin Foley who mentored him in early techniques of minimal access spine surgery. This approach to spinal stenosis is growing in popularity, especially for aging patients. Stenosis surgery previously required a three to four day hospital stay; it is now performed as day surgery. The general perception, even among practitioners, is that outcomes of surgery for the aging spine are negative, so the barrier to adopting minimally invasive techniques, often resisted because of the learning curve, wasn't as high as it might have been. Now it is gaining momentum. There is a widespread misperception that patients treated by surgery for spine problems have no better outcomes than those who have no surgery. While this may be so for indiscriminate surgical treatment of back pain, it is not so for the majority



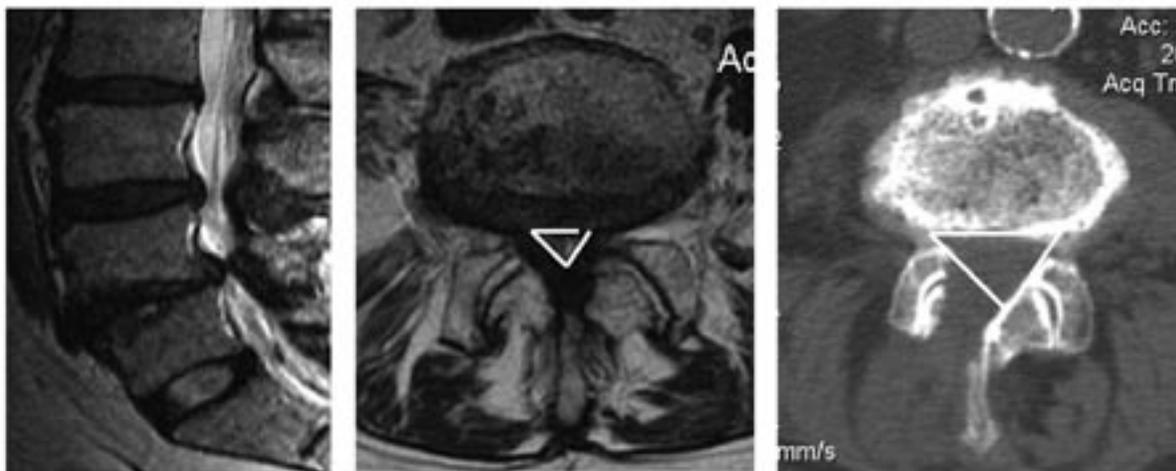
Raj Rampersaud

of degenerative disorders that undergo spinal surgery, such as radiculopathy or neurogenic claudication.

In addition this erroneous view derives from recent studies such as the intent-to-treat analysis of the large randomized SPORT trial (1), widely misinterpreted in the media. Patients with symptomatic lumbar disc herniation were randomly assigned to surgery or medical treatment. 30% of “non-surgical patients” could not adhere to their assigned treatment. Their crossover to surgical treatment accounts for the good outcomes they experienced and the apparent equivalence. While the media megaphone enjoyed implying excessive and unnecessary surgery, the under reported as-treated analysis showed that surgical patients enjoyed strong, statistically significant advantages at all follow-up times.

Raj's academic mission is to distinguish his work from the clouded record of disc surgery. “The key to good outcomes from spine surgery is patient selection.” We need to learn what we can and cannot fix; an abnormal MRI is not necessarily a reason to operate, nor is back pain. For patients with stenosis and back pain, but no neurogenic claudication, surgical intervention is not reliably effective; for those with neurogenic claudication, operations have a success rate of 80-90%, comparable to the success rate of hip and knee surgery. Raj's important academic paper published in *The Spine Journal* (2) showed that overall improvement in quality of life after two years following spinal decompression, measured by

Figure 1. Preoperative MRI (left and center images) demonstrating severe spinal stenosis at L4-5 in a patient with neurogenic claudication. The postoperative CT scan (right image) demonstrates restoration of the spinal canal (relative effective canal space shown by small to large triangle) following a minimal access decompression performed using a 18 mm kevhole technique.



SF 36, was similar to that attained following total hip or knee replacement.

Having developed minimally invasive techniques, Raj is now able to do spine surgery more quickly than before. He does about 200 spine cases a year, ranging from minimal access to maximal. 40% of his practice is now day surgery, up from about 10% when he started eight years ago.

Academically Raj's focus is on objective analysis of outcomes, using quality of life measures like SF 36. The importance of evaluating outcomes was impressed upon him during his residency in London where it was emphasized as the best way to improve practice. Hip and knee replacement surgeons see screened patients who are good candidates for surgery. The screening and prehabilitation program for those patients is described in the article "Hip and Knee Replacement" in the Spring 2006 issue of the Spotlight. Spine surgeons are still inundated with patients who are not good candidates (approximately 80%) for surgery -- not a good way to manage wait times.

The University of Toronto has a rich history of spine surgery, but it has been stored traditionally in separate specialty silos. Recently there have been more opportunities for cross training, with spine surgeons coming from both orthopaedic and neurosurgery. Raj is one of fourteen dedicated spine surgeons, a concentration unique to Toronto. He and his colleagues are developing a U of T Spine Program to enhance collaboration among specialties to focus on spine surgery. It will include scholars in biomechanics at Sunnybrook like Cari Whyne and surgeon-scientists in regenerative medicine like Michael Fehlings and Charles Tator. The group is searching internally for a director for the program. They will focus on education by creating combined rounds and fellowships, on collaborative research, and on interprofessional patient care. They are developing a model of care that will screen patients, directing those who are not good candidates for surgery to appropriate specialists.

Raj originally thought he would be an engineer -- his whole family is mechanically inclined. His father, who was a dentist in Guyana, is a hands-on person who could fix anything. The humanistic aspect and the flexibility of medicine made Raj choose this direction instead. He developed an interest in sports medicine while playing high school football, and was inspired by orthopaedic



Samina Rampersaud with daughter Amira

surgeons while in medical school. He chose spine surgery over sports medicine eventually because of the challenges, the academic potential and the need for spine surgeons. His mentors in London, orthopaedic surgeons Kevin Gurr and Stewart Bailey, piqued his interest in this field. Kevin Foley, his neurosurgery mentor in Memphis is a thoughtful practitioner of patient-centred care who taught Raj to look for the next step needed to improve surgical practice. A locum in Brantford gave him a valued community perspective.

Raj has been married to Samina for five years. Their 18-month-old daughter is named Amira, which means "princess". Raj and Samina take karate and home cooking classes. They live on the waterfront and enjoy biking there. They enjoy travelling in Europe and North America focussing on meeting and understanding local people and customs.

M.M.

(1) Weinstein JN, Tosteson TD, Lurie JD, et al. Surgical vs Nonoperative Treatment for Lumbar Disk Herniation: the Spine Patient Outcomes Research Trial (SPORT). *JAMA*. November 22/29, 2006;296(20):2441-2450.

(2) Rampersaud YR, et al. Assessment of health-related quality of life after surgical treatment of focal symptomatic spinal stenosis compared with osteoarthritis of the hip or knee. *The Spine Journal*. (in press.)

Spain Honours Andres Lozano



Alexander, Marie, Christopher and Andres Lozano (left to right)

Dr. Andres Lozano was awarded the Order of Spain for Meritorious Civil Service, one of Spain's highest civilian honours, in a ceremony at the Spanish Embassy in Ottawa on November 9, 2007. This Order was conferred by the Spanish Ambassador on behalf of His Majesty, Juan Carlos I of Spain, and recognizes Andres' work in developing surgical procedures for Parkinson's disease and depression and for educational and scientific collaborations between Spain and Canada.

Andres was born in Spain and immigrated to Canada with his family at the age of 2 ½. A graduate of the University of Ottawa Faculty of Medicine in 1983, Dr. Lozano underwent Neurosurgical Training at McGill University and became a Fellow of the Royal College of Physicians and Surgeons of Canada in 1990. During his residency in Montreal, Dr. Lozano earned his Ph.D. in Experimental Medicine. He joined the Neurosurgical Staff at the Toronto Western Hospital in 1991, and is currently Professor in the Department of Surgery and the inaugural Ron Tasker Chair in Stereotactic and Functional Neurosurgery.

A current Tier I Canada Research Chair in Neuroscience, Dr. Lozano's research pursuits are collectively aimed at identifying and characterizing neurons

and brain circuits involved in neurological disorders, along with developing new neurosurgical treatments to restore normal brain function. This work ranges from uncovering the molecular underpinnings of neurodegenerative disease in the wet lab to evaluating novel therapies in the operating room. Some of his most recent efforts are directed at identifying new targets for deep brain stimulation in medically-refractory major depression. Over the years his efforts have produced many fruitful collaborations both within the University of Toronto and on a global level, and have resulted in the supervision and guidance of numerous successful doctoral and post-doctoral students. Physicians and scientist from all over the world including Spanish neurosurgeons, have come to Toronto to train and collaborate in these projects.

As a recognized worldwide leader in the field of stereotactic and functional neurosurgery, Andres has held several prominent positions in organized neurosurgery including President of the World Society for Stereotactic and Functional Neurosurgery. He also holds editorial positions with multiple neurosurgical journals and serves in numerous advisory roles with governmental and non-governmental organizations, including the National Institutes of Health and the Michael J. Fox Foundation for Parkinson's Research. One of his most important achievements is the training of a new generation of functional neurosurgeons from across the globe who come to Toronto to learn from his insight and expertise and who have gone on to become leaders in this field.

During rare escapes from his hectic schedule, Andres and his wife Marie enjoy travelling the globe with their proudest achievements, sons Alexander and Christopher, ages 12 and 13.

The Meritorious Civil Service Order of Spain was instituted by royal decree in 1926. Its explicit purpose is to recognize extraordinary contributions of resident and foreign Spanish citizens towards the good of the Nation of Spain.

*Scellig Stone
Neurosurgery Resident
and graduate student with Dr. Lozano*

Emerging Therapies for Spinal Cord Injury



Michael Fehlings

Spinal cord injury (SCI) remains a daunting challenge for clinicians and scientists alike, but progress is being made. Dr. Michael Fehlings has made major contributions to this field, recognized with last year's Lister Prize, the highest award for academic achievement in the Department of Surgery. With hundreds of peer reviewed clinical and basic science contri-

butions, Dr. Fehlings has made significant contributions to the field over the course of his distinguished career. Over the last two decades, the prognosis for patients with spinal cord injury has improved appreciably: cervical SCI had a mortality rate of 40% in the early 1980s, but current critical care techniques have reduced this to approximately 5%. Progress in improving the neurological disability that these patients face has been much slower.

Years of research strongly suggest that SCI may be amenable to therapy. The MRI era has shown us clearly that even in the absence of spinal cord function, the spinal cord is very rarely transected. This raises the possibility of enhancing or restoring function in the remaining neural tissue. We have learned that a significant proportion of the damage that occurs following SCI occurs in delayed fashion. A complex series of inter-related "secondary injury" events occur on the cellular level leading to progressive loss of spinal cord cells and axons. Secondary injury results from processes such as ischemia, mitochondrial dysfunction, toxicity from excitatory amino acid release and dysregulation of electrolytes. The delayed nature of these events provides a window which may be therapeutically exploitable.

A number of pharmacological agents which specifically target these processes have entered human SCI clinical trials. Within the last decade, human trials demonstrated modest benefit from the administration of GM-1 ganglioside (also known as Sygen®), thyrotropin releasing hormone and methylprednisolone. Only methylprednisolone has come to clinical use, however its use has become controversial

because of concern that its side-effects may outweigh its benefits. We are currently without an effective, widely accepted therapy for SCI treatment.

Appreciable research in this field is beginning to bear fruit, however. A new generation of putative therapies are making their way to the clinical realm, leading to new-found optimism for SCI researchers and patients alike. One of the earliest therapies Dr. Fehlings studied in his research laboratory is the pharmacological agent riluzole, which antagonizes cellular sodium entry and release of the excitotoxic neurotransmitter glutamate. In work which earned him a gold medal from the Royal College of Physicians and Surgeons of Canada, Dr. Fehlings and his team demonstrated a reduction in spinal cord damage as well as improvement in functional outcome when experimental animals were treated with this agent. Phase I clinical trials will begin in 2008 and we hope that the same benefits will be seen in humans.

Recent years have seen the Fehlings laboratory explore a number of other promising therapeutic strategies. Gene therapy with VEGF, which stimulates angiogenesis, is showing benefit in pre-clinical studies. His laboratory has shown that their viral delivery technique leads to an increase in spinal cord vascularity with a reduction in apoptotic cell loss.

The Fas death receptor is a trigger of apoptotic cell loss. Work by the Fehlings group with an agent which blocks this receptor has demonstrated a 30% decrease in cell death following SCI as well as improved functional outcome. This may be a promising therapy in the future.

Dr. Fehlings' group has also has great success with so-called cell-replacement therapy in the subacute injury phase. Their protocol involves isolation of neural precursor cells from the mouse, and subsequent transplantation into peri-lesional rat spinal cord. Co-administration of a growth factor cocktail is then used to drive these cells to a predominant oligodendroglial differentiation. Many axons remain intact following SCI, but are dysfunctional because of oligodendroglial loss and demyelination. Remarkably these exogenous cells have demonstrated the capacity to remyelinate these demyelinated but viable axons leading to improved electrophysiology and functional recovery.

Another noteworthy SCI therapy which Dr. Fehlings has helped bring to clinical trials is Cethrin®, which is a promising pharmaceutical agent developed by Dr. Lisa McKerracher from McGill. While myelin is normally

essential for facilitating axonal conduction, it becomes inhibitory to axonal outgrowth following trauma when such sprouting might be beneficial. While a number of inhibitory molecules exist, they have all been demonstrated to signal via a common intracellular pathway, specifically the proteins Rho and Rho kinase. Cethrin® potently inhibits Rho activation and can be applied transdurally at the time of a decompressive surgery shortly after injury. This promising agent is currently being investigated in early-stage clinical trials.

All of these approaches are years away from widespread clinical use, in the best case scenario. It would be even better if we could alter existing management practices in SCI care to facilitate improved outcome with measures currently within our means. Many have postulated that early decompression of the spinal cord may be such a measure, which could lead to better outcomes; indeed, animal studies have shown definitively that early decompression is of benefit. The utility of early decompression is much less clear in the human polytrauma patient who is frequently medically unstable in the early hours and days following an SCI. Michael Fehlings has worked with his mentor Charles Tator to initiate the Surgical Trial in Acute Spinal Cord Injury Study (STASCIS) which aims to answer this important question. This trial, which has been changed to a prospective cohort study because of slow accrual under randomized methodology, uses the 24h post-injury mark to mark the boundary between early and late surgery. With over 240 patients enrolled, this trial will soon be complete. Early analysis suggests a treatment effect, and there is thus a strong chance that this study will alter the surgical management of this condition.

Any one of these contributions to SCI research would be remarkable; it is astounding that Dr. Fehlings has contributed so significantly to the development of so many of the emerging therapies for SCI. Though he started his career in General Surgery, Alan Hudson recognized his talent when he recruited him to a career in Neurosurgery... and one can't help but wonder how the SCI field would be different had this recruitment been unsuccessful. Michael Fehlings has become one of the world's foremost neurosurgeons and SCI researchers and we look forward to the advancements that he will bring in the years to come.

*Gregory Hawryluk,
Neurosurgery Resident*

The Bigelow Lecture

CEREBRAL COLLATERAL COMPLICATIONS ASSOCIATED WITH MYOCARDIAL REVASCULARIZATION

Dennis Mangano, a remarkably prolific and insightful critical care anaesthesiologist earned his PhD in mathematics at MIT before entering medical school. His understanding of complexity and extensive research on brain function after cardiopulmonary bypass made him an ideal candidate for the Bigelow Lecture. He has long been a



Dennis Mangano

collaborator with Richard Weisel, who introduced him to the audience. Dennis paid significant and respectful homage to Bill Bigelow, reviewing his studies of hibernation, his pursuit of hibernin and his significant contribution of the protective effects of hypothermia during cardiopulmonary bypass. He then reviewed the prevalence of cerebrovascular disease in patients over 65 -- 36% in those who undergo cardiovascular surgery. The cost of postoperative central nervous system complications is staggering -- 1.4 billion dollars per year.

Dennis has led a remarkable number of clinical trials through his network of cardiac colleagues throughout the world. He is the founding President of the Ischemia Research and Education Foundation. He reviewed the precipitating factors in central nervous system complications, demonstrating embolic ischemic changes in the retina and PET scans of the brain, showed us the vascular problems in the aorta and carotid arteries which should be scanned or evaluated prior to cardiopulmonary bypass. During perfusion, hypotension is a common complication based on worldwide studies conducted with his colleagues. The stroke rate is clearly reduced in patients who are maintained with higher mean blood pressure. Macroembolic injury occurs from disturbance of aortic plaques. Microemboli cause small capillary arterial dilations (SCAD). Hyperglycemia during bypass increases progression of ischemic injury and progression to hemorrhage. For each 0.5 degrees centigrade the stroke severity doubled. There is an inflammatory cellular response to bypass via selectins adhesion molecules and

inflammatory cytokines. In general there is an incidence of approximately 3.2% of clear cut strokes and an additional 3% who develop encephalopathy with transient global dysfunction. Cognitive dysfunction persists long-term in patients after cardiopulmonary bypass in 5%. Treatment options include retrograde cerebral perfusion, avoidance of aortic and carotid pathology through preoperative or precannulation imaging, intra-aortic filters, temperature management and various pharmacologic interventions. Prominent among these is the use of barbiturates and insulin (1), anti-inflammatories such as steroids, nsoids and protease inhibitors.

Adenosine augmentation is a special interest of Dennis Mangano's. There's clear evidence that adenosine increases in coronary venous blood in response to injury. Augmentation of the protective effects of adenosine decreases mortality, heart failure and stroke. Some novel approaches to the problem of central nervous system injury include the omission of anaesthesia (not a good idea) and exploration of the technology of off-pump cardiac surgery. There are fewer micro-emboli by doppler and meta-analyses of series of off-pump cases shows a decreased incidence of stroke with omission of the cardiopulmonary bypass. The vascular blood pressure temperature factors still influence postoperative cognitive outcomes. Antithrombotics such as tissue plasminogen activator and heparin have hemorrhagic side effects which limit their usefulness. Recent use of low molecular rate heparin has proven to be helpful in stroke patients.

Dennis left us with the message that the activated platelet which causes microvascular plugging should be a target of therapy. Remarkably low doses of aspirin inactive platelet cyclo-oxygenase and early administration of aspirin in the postoperative period has been proven to decrease strokes, encephalopathy and cerebral death. He concluded by saying we have now better insight into cognitive dysfunction and a very good understanding of what to avoid. The brain suffers from many of the drugs that we have tried, but hypothermia and aspirin work -- the best solution. The rest of the solution still evades us. He returned to Bigelow's legacy and ably illustrated and exemplified Bigelow's wide ranging intellectual curiosity and intellectual humility.

M.M.

(1) Rao V, et al. The Insulin Cardioplegia Trial: Myocardial protection for urgent coronary artery bypass grafting. *J Thorac Cardiovasc Surg.* 2002;123:928-35.

A Tribute to Quality Care

Rose Patten's generous gift honours the "unsung heroes" whose compassionate care changed her life.



Rose Patten

A fourteen-year veteran of university governance and former Chair of the Governing Council, Rose Patten confides that her time in office has been her "greatest milestone".

Quality leadership defines Ms. Patten's role in the community and in her professional life. As Senior Executive Vice-President, Head of Human Resources and Senior Leadership Advisor for BMO Financial Group, she is responsible for BMO's enterprise-wide human resource management. The St. John's, Newfoundland native, who has held executive positions in human resources throughout her career, is a champion of workplace diversity. Her pioneering and innovative strategies led her to be named "one of the 25 most powerful women in banking" by *U.S. Banker* magazine.

An indomitable spirit and unwavering confidence also characterize Ms. Patten's approach to her health. Following a 1983 car accident that badly damaged her hip and left her unable to walk, she underwent extensive physiotherapy and eventual hip replacement surgery at Mount Sinai Hospital. Despite that injury, she is now an accomplished marathon runner. Her physicians, Drs. Allan Gross and Ron Taylor, commend her resolve and motivation subsequent to surgery: "She took a minimal amount of time off work and worked extremely hard with respect to her rehabilitation and made the most dramatic recovery," notes Dr. Gross.

Her dedication to the community and to the university has been further strengthened through the establishment of the Drs. Gross and Taylor Award in the Faculty of Medicine, a gift of \$20,000. This award will be directed to second-entry students in the MD program who demonstrate an interest in orthopaedic surgery. Ms. Patten describes the endowment as an "expression of gratitude" to honour Drs. Gross and Taylor for their care, and to encourage young doctors to pursue surgical careers.

“These doctors are unsung heroes,” says Ms. Patten. “They gave me confidence, they were very responsive to my needs, and their care was amazing. It’s common for scientific breakthroughs to be acknowledged, but I wanted to recognize regular physicians and their achievements. Make them heroes, because such people have an enormous impact on health care in Canada.”

For Dr. Gross, this is an opportunity to see a patient make a complete recovery from a traumatic injury with grace, warmth, and inspiring generosity: “The gift is extremely appreciated, but at the same time Ms. Patten was so wonderful to treat, requiring minimal care. To see the final result and what kind of patient she was, is just incredible.”

*Nancy Collett
Senior Development Officer*

Extending Trauma Training Internationally

Dr. Jameel Ali, Professor of Surgery and Director of the University of Toronto Advanced Trauma Life Support Training Program for residents is a member of the Division of General Surgery at St. Michael’s Hospital and part of the International Trauma Education Faculty of the American College of Surgeons.



Jameel Ali

On October 19th – 20th, 2007, Dr. Ali conducted an Advanced Trauma Life Support Instructor Course for physicians in Costa Rica under the auspices of the College of Physicians and Surgeons of Costa Rica. This program is an extension of the Trauma Outreach Program which originated at St. Michael’s Hospital last year when physicians from Costa Rica were trained in Advanced Trauma Life Support.



Faculty and Coordinators of the ATLS Course

Following this program, Dr. Ali conducted Trauma Evaluation and Management (TEAM) Programs for 400 medical students at St. George’s University in Grenada.

Dr. Ali was part of the American College of Surgeons international ATLS promulgation faculty at their annual meeting and the Advanced Trauma Life Support Instructor Course in Karachi, Pakistan. These were the inaugural courses sponsored by the College of Physicians and Surgeons of Pakistan. Dr. Ali will train other educators together with ATLS instructors so that Pakistan will have a self sustaining Training Program in Trauma Care similar to those in 46 other countries where the program



Participants of the Costa Rica Course

has previously been introduced. Since its inception, over 750,000 physicians have been trained internationally through the Advanced Trauma Life Support Program in the concepts of care of severely injured victims.

ANNOUNCEMENTS

PROFESSOR RICHARD REZNICK REAPPOINTED AS THE R.S. MCLAUGHLIN CHAIR, DEPARTMENT OF SURGERY, UNIVERSITY OF TORONTO

It is with great pleasure that I announce the Provost's approval of the re-appointment of Professor Richard Reznick as the R.S. McLaughlin Chair of the Department of Surgery at the University of Toronto, commencing January 1, 2008 for a second 5-year term. Following an outstanding 5-year academic review of the Department of Surgery, Professor Reznick will resume his leadership of the Department of Surgery that has been ranked in the top 10 globally by the external reviewers. Under his leadership, the Department has continued to increase its annual research funding, attract outstanding residents and fellows, and remains the "go-to" department for surgical scientist training in Canada. During his term as Chair, Professor Reznick has very successfully advanced his scholarly pursuits in education research. He has been recognized with numerous international awards and honours including the John P. Hubbard Award from the National Board of Medical Examiners, the Daniel C. Tosteson Award for Leadership in Medical Education from Harvard's Carl J. Shapiro Institute for Education and Research, and the inaugural President's Teaching Award from the University of Toronto. Professor Reznick also holds the position of Vice President Education at University Health Network and continues to promote major innovative initiatives in surgical skills training and simulation. Please join me in warmly congratulating Professor Reznick on his remarkable accomplishments and wishing him every success in his second term as Chair of the Department of Surgery.

Catharine Whiteside
Dean, Faculty of Medicine

DOUG WOOSTER WINS WOOLF AWARD AND FEAR FELLOWSHIP

Doug Wooster has received the 2007 Colin R. Woolf Award for Long Term Contributions in Continuing Education. This award is the most prestigious continuing education



Douglas Wooster

award offered by the Faculty of Medicine. It recognizes Doug's sustained commitment to excellence in continuing education locally, nationally and internationally. Doug has also received the David Fear Fellowship. This fellowship allows the recipient to travel to gain new insight into education issues. Doug will travel to Washington, DC early this year. He will visit the Association of American Medical Colleges and the American College of Cardiology to explore guideline implementation, self-assessment and educational scholarship in continuing education. The fellowship is named for David Fear who exemplified the role that may be played by active clinicians and educators in the development, coordination and promotion of continuing education (CE) at the level of departments, hospitals, communities and across the Faculty of Medicine. David was an anaesthetist at the Hospital for Sick Children, active in the University's Department of Anaesthesia, where he served as Director of Continuing Education, and the Chair of the Faculty Council Committee on Continuing Education. Until his untimely death in June 1997, his leadership in clinical, educational and administrative roles was instrumental in raising awareness of, and competence in, continuing education.

RONALD LEVINE APPOINTED DIRECTOR, POSTGRADUATE SURGICAL EDUCATION

I am pleased to announce that Ron Levine will succeed me as Director, Surgical Education. In collaboration with our Program Directors, Ron will oversee our 11 residency training programs and take charge of the parallel Core Surgery Program.

Ron has served as Plastic Surgery Program Director for 13 years. In that time he received strong support from his residents and surgeon colleagues, raised the standard of education, and has



Ronald Levine

been praised widely by trainees, surgeons, administrative staff, accreditors and other program directors. Ron is a superb teacher and role model. He has won many teaching awards, including the Arnie Freiberg Award in Plastic Surgery, PAIRO Excellence in Clinical Teaching Award, and our department's highest honour for resident teaching, the Bruce Tovee Award, in 2007. Ron has authored 24 peer reviewed publications, served as the leader of the OMA section of Plastic Surgery, and has led the Division of Plastic Surgery at St. Joseph's Health Centre for over a decade.

Ron is a devoted surgeon, teacher, educator, husband and father -- we are grateful he will continue to share his leadership talents. Please join us in welcoming him to his new role!

John M.A. Bohnen
Vice-Chair, Education

SIDNEY RADOMSKI APPOINTED SPECIAL ADVISOR TO THE CHAIR ON EDUCATION

We are pleased to announce that Dr. Sid Radomski from the Division of Urology has been appointed as the Department of Surgery's Special Advisor to the Chair on Education. Sid will assume Bill Tucker's roles as Chair of the Awards Committee as well as Chair of the Internal Evaluation Committee. Sid has been a member of our Department since 1991 and we look forward to working with him in his new role!



Sidney Radomski

Richard K. Reznick, Chair
John M.A. Bohnen, Vice-Chair, Education

MARTIN BARKIN TO LEAD ALUMNI ADVANCEMENT IN SURGERY

I am pleased to announce that Professor Martin Barkin has agreed to lead our efforts in alumni advancement in Surgery. Martin will take over the helm from Professor



Martin Barkin

Charles Tator who has served this Department in that role for the last five years. Let me begin by thanking Charles for his dedicated efforts. Charles has contributed to this Department in so many magnificent ways, and his efforts in alumni advancement have helped this Department grow financially. Martin Barkin is an icon in urologic surgery, at Sunnybrook, and in health care in Ontario. At Sunnybrook he has held many positions, including Chief of Urology, President and CEO, and Chair of the Board. In Government, he has also served in many capacities, including Deputy Minister from 1987-1991 and as Secretary of Premier's Council on Health Strategy. We recently celebrated the instantiation of the Dr. Martin Barkin Chair in Urologic Research at the University of Toronto, a position held by the Division Chair, Sender Herschorn. Please join me in welcoming Martin to his new role and thanking him for a lifetime of contributions to this Department.



Charles Tator

Richard K. Reznick, Chair

MESSAGE FROM CATHARINE WHITESIDE AND DAVID NAYLOR

(read full message at <http://www.facmed.utoronto.ca/Assets/about/medemail/v16n7.pdf>)

Early last month, University of Toronto President David Naylor addressed the Royal Society of Canada, and an adapted version of that address was published in *The Toronto Star*. His message was that in this country, investment in preparing our citizens for the knowledge economy is insufficient and too limited in its reach. To use his phrase, "our investment starts thin and gets thinner". The full article can be viewed here: <http://www.news.utoronto.ca/bin6/thoughts/071113-3504.asp>

Among the evidence he cited:

- Twenty years ago Canadian universities received \$2,000 per student more from governments than their U.S. peers. Today they receive on average \$5,000 less.
- Compared with other OECD nations, our participation rates are very high for community colleges, average for undergraduate university degrees, and low for graduate degrees.

Although our universities and scholars continue to achieve great things, we do so in spite of some policy issues that must be addressed if we are to recognize our potential. As President Naylor outlined in his address, governments need to increase funding for basic research and researchers; funding agencies should keep their focus on research, rather than being diluted by applied research mandates, promoting commercialization or oversight of matching programs and networks with industry; the job of commercialization is better left to dedicated commercialization organizations and infrastructure; we must increase our output of Master's and PhD graduates to catalyze the growth of our knowledge-based industries.

Most vitally, President Naylor pointed out that every time a Canadian research university receives a grant, they take on new costs for supporting that research, be it through heating and lighting labs and through necessary support services. In Britain and the U.S., those services are acknowledged with, respectively, 48 and 60% recovery of what are typically referred to as indirect costs, but what we might well describe as part of the full cost of research.

We need funding that reflects the true, full cost of health and biomedical research. Last year, Research Canada commissioned a survey which affirmed 91% of Canadians desire more government investment in health and medical research and that 86% want Canada to be a global leader in health and medical research. We are committed to help Canada realize its full potential as a centre of discovery.

Catharine Whiteside



Scientists in Surgery

Approximately 15% of our surgical faculty are individuals who are non-MDs and work as full time scientists. These individuals are significant contributors to the research effort of our Department. This section will endeavour to profile excellence in research among the scientists in our Department.

Dr. Manuel Gomez is the unsung hero of our Burn Unit. It is difficult to put in words all of the duties, responsibilities, and positions held by Manuel. His involvement in our Burn Centre has allowed us to attain National and International recognition. A general surgeon who trained in Columbia, he left his home to travel to Toronto to make a



Manuel Gomez

better life for his family. In addition to holding specialty training in General Surgery, Manuel obtained a Master of Science Degree at the University of Toronto, a Certificate in Community Health, and he is an accredited Tissue Bank Specialist. He is involved at many levels with the various professional burn associations including the Canadian Special Interest Group, the American Burn Association as well as the International Society for Burn Injuries.

Dr. Gomez worked as a Clinical Fellow in the Ross Tilley Burn Centre when the clinical care was provided at the Wellesley Hospital. He switched his career to become a fulltime Research Associate at the Burn Unit following his clinical fellowship. Since then he has spent all his time completing studies and publishing manuscripts so that our burn centre is recognized internationally. His appointment to the Department of Surgery as an Assistant Professor in 2004 represented an achievement which resulted from all the work that Dr. Gomez has been involved in for the burn centre. There are multiple areas within the Critical Care/Trauma Program that Dr. Gomez interfaces with currently. He has more than 60 peer reviewed publications and hundreds of abstracts presented at international meetings. As part of his work and his role in the Division of Plastic Surgery and the Department of Surgery he is always the person to 'show up' and support other members of the Department. When Manuel was first introduced to the

world of burn care, we would travel to meetings together and I would introduce him to others. The tables have now turned – when I attend meetings with Manuel, he is now introducing me to many of the people he works with. The dedication and commitment that Dr. Gomez brings to his job has led to his becoming a mentor and role model for many that have traveled through the Burn Unit.

It is a pleasure to highlight some of the accomplishments of one of the outstanding members of our Department in our newsletter.

Joel Fish

Division of Plastic Surgery

Medical Director, Ross Tilley Burn Centre

NEW STAFF

The Department of Surgery warmly welcomes the following individuals who have joined our Department.

BENJAMIN DEHESHI



We are delighted to welcome Benjamin Dehesi to the Orthopaedic Division at Mount Sinai Hospital (MSH). Dr. Dehesi graduated from the University of Saskatchewan College of Medicine in 2000 and went on to complete his orthopaedic surgery training at the University of Ottawa, where

he successfully completed his residency in 2005. Ben will be specializing in Musculoskeletal Oncology, joining the University's Musculoskeletal Oncology Unit. In addition, he will be pursuing research into the underlying molecular mechanisms causing sarcomas as part of the Interdisciplinary Health Research Team in Musculoskeletal Neoplasia at the University. Dr. Dehesi is currently enrolled in graduate training at the Institute of Medical Science, under the supervision of Drs. Jeff Wrana and Jay Wunder. His graduate research focus is on transforming growth factor beta signaling in metastatic osteosarcoma. Dr. Dehesi's future goals are to integrate his basic science research experience into his clinical practice in an attempt to develop optimal

treatment strategies for sarcoma patients. Ben's exceptional clinical skills, and strong start to his research, and innovative nature will position him to easily achieve his goal.

In addition to his new academic position in Toronto, Ben recently married Shabana and we welcome both Ben and Shabana to our Toronto community.

Benjamin Alman

University Division Chair, Orthopaedic Surgery

OLEG SAFIR

The Division of Orthopaedic Surgery is pleased to welcome Oleg Safir to our faculty. Oleg will be joining the department as an orthopaedic surgeon at Mount Sinai Hospital (MSH). He graduated from the Medical Academy in Dnepropetrovsk, Ukraine and in 2002, Oleg completed his training in orthopaedic surgery at the University of Tel Aviv in Israel. In 2006, he completed a clinical and a research fellowship in Adult Lower Extremity Reconstruction at MSH. He demonstrated exceptional clinical and academic skills during this time. As such, he was recruited to our faculty. Currently, Oleg is running a part time clinical practice in orthopaedic surgery at Mount Sinai, and is concurrently pursuing a Masters Degree at the Ontario Institute for Studies in Education (OISE), at the University of Toronto and a fellowship at the Wilson Centre for Research in Education. Dr. Safir's clinical academic interest is lower extremity reconstruction with focusing on the revision arthroplasty of the hip, and the use of osteotomies and osteochondral allograft transplantation around the knee. In his education studies his main interest is self directed learning in the acquisition of surgical skills.



Oleg and his wife, Maria, recently welcomed a new son, Maximilian, into their family.

Dr. Safir has proven himself to be a top notch clinician, a great teacher, and enthusiastic academician, and a collegial colleague. We are looking forward to great accomplishments from Oleg.

Benjamin Alman

University Division Chair, Orthopaedic Surgery



Martin McKneally

Developing Surgical Judgement

Judgement is defined in Webster's College Dictionary as "the ability to make a decision or form an opinion objectively (and) wisely, especially in matters affecting action." Good surgical judgement is highly prized by surgeons, colleagues, patients and their families.

In this issue of the Spotlight we learn about hepatobiliary surgeon Carol-anne Moulton's exploration of surgical judgement as a topic of research with our colleague, cognitive psychologist Glenn Regehr. Her initial scan of surgical opinion revealed that surgeons find good judgement hard to define, though they can readily recognize it or its absence. In this column I will try to propose an approach to understanding and teaching surgical judgement in the hope that practicing surgeons will critique and illuminate this "zero draft" in a blog on the website. (www.surgicalspotlight.ca/) This discourse should prove at least interesting and possibly helpful as Carol-anne develops her more formal analysis.

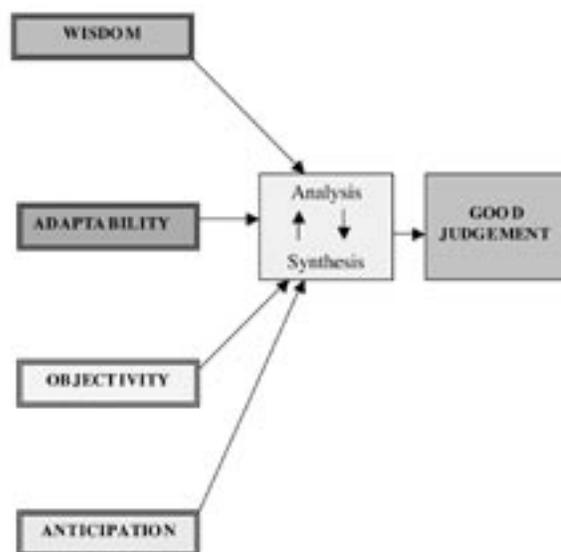
Good judgement might be described as an integrated sum of **wisdom, adaptability, objectivity** and **anticipation**. (Figure 1) **Wisdom** derives from knowledge and experience, both the direct experience of the surgeon and the indirect experience derived from reading and observation of the experience of others. Thoughtful discourse, reflection and analysis of experience (for example in morbidity and mortality conference) contributes to the sum of a surgeon's wisdom. **Adaptability** depends on the surgeon's observational skills, particularly the ability to detect and interpret faint signals below the threshold of novices. This leads to what Carol-anne describes as situation awareness. Flexibility enables the surgeon to adapt to unusual or unanticipated circumstances. **Objectivity** is strengthened by training to minimize fear, emotion or bias that might impair our response to the remarkable challenges of surgical practice.

Anticipation and preventive thinking are a defining element of surgery exemplified by the application of

hemostats before transecting a vessel. Ralph Manktelow's memorable University Rounds lecture described the mental preparation of elite athletes anticipating winning performance, and its potential application in surgery. (www.surg.med.utoronto.ca/newsletter/newsletterSpring05.pdf) The surgical checklist, a formal summation of required actions based on the wisdom, experience and judgement of others strengthens anticipation and reduces the need to expend cognitive resources on routine preventive measures. The element of anticipation is probably more important in pre-operative and post-operative care. Objectivity, adaptability and wisdom are more critically engaged during intraoperative decision-making, especially when unexpected findings or problems arise.

Checklists comprise a unique component of anticipation. Surgeon-essayist Atul Gawande describes their impact on critical care in the December 10, 2007 issue of the New Yorker. (www.newyorker.com) In his usual riveting style, Atul recounts the evolution of the checklist from its origin in aviation. On its first test flight, the B-17 flying fortress stalled at 300 feet, spun and crashed due to "pilot error". An expert test pilot had found in its ingenious complexity "too much airplane for one man to fly". The pre-flight checklist that resulted from analysis of that failure became standard practice in aviation, and the B-17 became the icon of U.S. air superiority in World War II. "Medicine today is in its B-17 phase: too much for one person to fly."

Figure 1



The remarkable campaign of Johns Hopkins intensivist Peter Pronovost to prove the value of checklists in the critical care unit, “the flying fortress of medicine”, is the next story in Gawande’s narrative. Dramatic reductions in line infections, ventilator related pneumonia, medication errors, costs and deaths were demonstrated at Hopkins, then in Michigan. (1) Many states and the entire country of Spain have adopted this commonsense but still uncommon approach. Resisters, and there are many, don’t want to be “slowed-down” by a checklist or monitored by a nurse for compliance with practices of indisputably superior safety.

“Slowing down” is exactly what Carol-anne and Glenn call the phenomenon they’re studying. They are analyzing the moment when we switch from reliance on automatic freewheeling performance of complex tasks -- such as driving or suturing, to mindful, reflective summoning of additional cognitive resources. We slow down literally or metaphorically when a crisis requiring our full attention and best judgement arises in traffic or in surgery.

How should surgeons be taught to develop good judgement? Given the record of our surgical education program we can be confident that excellent techniques will be developed from this research project. In the interim we can certainly strengthen decision-making by requiring resident surgeons to make decisions, commit to expressing their judgements and recommendations, and give their reasons in precise language that exemplifies clear thinking, thoughtful analysis and synthesis. Similarly, they can be required to make and defend intraoperative judgements before they are pre-emptively guided to the best decision as specified by their seniors or teachers. Exercise of decision-making rather than rote memorization of routines can help us move from “knowing good judgement when we see it” to teaching good judgement as effectively as we teach good surgical technique.

Martin McKneally
Editor

(1) Pronovost P, et al. An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU. *N Engl J Med* 2006;355(26):2725-32.

CORRESPONDENCE

Letters to the Editor are welcomed to keep the community informed of opinions, events and the activities of our surgeons, friends and alumni.

FAMILY NEWS

In future issues of The Surgical Spotlight we would like to include a section on our families. Please send us birth and marriage announcements with photographs, as well as any other family news you would like to share with the Department of Surgery community.

HONOURS/AWARDS/ ACCOMPLISHMENTS

Michael Cusimano (NeurSurg) has been awarded the 2007 John Provan Outstanding Canadian Surgical Educator Award. This award is sponsored by the Canadian Association of Surgical Chairmen in recognition of outstanding contributions to Undergraduate Education in Canada.

Peter Dirks (NeurSurg) received an NCIC Award of Excellence in Cancer Research, The Terry Fox Young Investigator Award.

Michael Fehlings (NeurSurg) has been successful in winning:

- First Place - Basic Science Research Award from the Cervical Spine Research Society for his paper titled: “Development of a Novel Strategy, Based on Inhibition of Fas Signaling, to Reduce Cell Death and Promote Functional Recovery in a Mouse Model of Cervical Spondylotic Myelopathy”.
- Second Place - Clinical Research Award from the Cervical Spine Research Society for his paper titled: “The Impact of Age at the Timing of Injury on the Mortality and Neurological Outcome After Acute

Traumatic Spinal Cord Injury: Examination of the NASCIS-2 Database”.

- First Place - Research Award in the 15th Interurban Spinal Cord Injury Conference, Hamilton, ON, October 2007 for his project titled: “Mortality and Neurological Outcome in the Geriatric Population following Spinal Cord Injury: A Retrospective Cohort Study of 485 Patients”.

Raja Rampersaud (OrthSurg) and his team (including Steve Lewis) won the Best Paper Award at the recent North American Spine Society (NASS) meeting for work which demonstrates that the outcomes of spinal stenosis surgery are comparable to total joint arthroplasty.

Joseph Schatzker (OrthSurg) was appointed as a Member of the Order of Canada, this country’s highest honour for lifetime achievement; it was announced by Her Excellency the Right Honourable Michaëlle Jean, Governor General of Canada on December 28, 2007. The citation recognizes Joe for his contributions to orthopaedic surgery, particularly for introducing surgical procedures for the internal fixation of fractures to North American surgeons.

Subodh Verma (CardSurg) has received a Canada Research Chair in Atherosclerosis (Tier 2) Award (\$500,000).

Farshid Tabloie (OrthSurg Resident, Supervisor: D. Backstein) has been awarded the 2007 Physicians’ Services Incorporated Foundation (PSI) Resident Research Award (\$2,000) for his paper entitled: “The Effect of Computer Navigation on the Learning of Surgical Skills”.

Jensen Tan (GenSurg Resident, Supervisor: C. Law) has been awarded the 2007 Physicians’ Services Incorporated Foundation (PSI) Resident Research Award (\$2,000) for his paper entitled: “Surgical Management of Cholangiocarcinoma – A Population-based Analysis”.

Robin Humphreys (NeurSurg Alumni) was the Lifetime Achievement Award Winner at the 36th Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. November 26 – December 1, 2007, South Beach Miami, Florida.

GRANTS / FELLOWSHIPS

Darius Bagli (UrolSurg) along with his Co-PIs: Norm Rosenblum, Dat Tran (SickKids/UofT), Arturas Petronas (Centre for Addiction and Mental Health), Anne Stapleton (University of Washington) were awarded a SickKids Research Institute New Ideas Grant in April 2007 for their study titled: “Epigenetic Changes in Uroepithelium Following E. Coli Infection: New Keys to Understanding Urinary Tract Infection Susceptibility”.

Peter Dirks (NeurSurg) received a 5 year operating grant from CIHR for his work on: “Asymmetrical Self Renewal in Normal and Cancer Stem Cells of the Human Brain”.

Hai-Ling Margaret Cheng (SickKids MR Physicist), **Walid Farhat** (UrolSurg) and Greg J. Stanisz (Sunnybrook Physicist) co-applicants have been awarded the SickKids New Investigator Grant (SickKids Foundation) in coordination with the CIHR for a study entitled: “Quantitative MRI of Angiogenesis and Cellularization in Tissue Regeneration”. They were awarded a total of \$129,223.00 for two years beginning January 2008.

Michael Fehlings (NeurSurg) and his international colleagues have received a 21st Century Grant from the Cervical Spine Research Society for their study: “The Delphi Trial_I(RCT)2: International randomized clinical trials of rheumatoid craniocervical treatment intervention prognostic (cost-) effectiveness trial comparing ‘early’ surgery with prolonged conservative treatment”.

Michael has also received a 2-year grant from Sangamo BioSciences Inc to study: “VEGF Zinc Finger Transcription Gene Factor Therapy for the Treatment of Stroke”.

Michael Fehlings (NeurSurg) and **Charles Tator** (NeurSurg) received a grant renewal from the Christopher Reeve Foundation to continue their participation in the North American Clinical Trials Network, 2008.

Michael and **Charles** have also received a 1-year grant from the McLaughlin Centre for Molecular Medicine to continue their studies on: “Spinal Cord Injury Repair”.

Ab Guha (NeurSurg) has received a RTOG Translational Research Seed Grant for his project entitled: “GATA4 and GATA6 as Prognostic Indicators of Glioblastoma Multiforme Patients”.

Ab is also the recipient of a Schering-Plough Canada Unrestricted Educational Grant for his work with the Canadian Virtual Brain Tumor Bank.

Eric Massicotte (NeurSurg) was the recipient of a 3 year CIHR Operating Grant for his work: “Study of Annulus Fibrosus Cells on Polyurethane Scaffolds and the Regulation of Matrix Orientation: Towards Tissue Engineering a Functional Intervertebral Disc”.

Robin McLeod (GenSurg) has received a Physician’s Services Incorporated Foundation (PSI) Operating Grant (\$93,000) for a study titled: “Randomized Controlled Trial Comparing the Effectiveness of a Web Based Journal Club to a Standard Journal Club Format to Teach Critical Appraisal Skills”.

Robert Richards (OrthSurg) has received a Physician’s Services Incorporated Foundation (PSI) Operating Grant (\$80,000) for his study: “A Novel Delivery System for BMP-2 to Enhance ACL Graft Integration”.

Sandro Rizoli (GenSurg) has received a Physician’s Services Incorporated Foundation (PSI) Operating Grant (\$20,000) for a study titled: “Management of Occult Pneumothoraces in Mechanically Ventilated Patients” - Pilot Study.

Michael Taylor (NeurSurg) is the first Canadian to be awarded a 3-year grant from the Sontag Foundation for his project entitled “Multiple Genetic Events Converge to Target Histone 3 Lysine 9 Methylation in Pediatric Medulloblastoma”.

Subodh Verma (CardSurg) has received a CFI Grant (\$336,062) for his study on: “Vascular Biology and Atherosclerosis Infrastructure Support” at St. Michael’s Hospital.

Betty Kim (NeurSurg Resident) received a Restracom Fellowship Award from The Hospital for Sick Children.

Won Kim (OrthSurg Resident) has been awarded a 2007-2008 JBJS Resident Journal Club Grant (\$2,500) on behalf of the *Journal of Bone and Joint Surgery*, and the Orthopaedic Research and Education Foundation.

ANNOUNCEMENTS

Dr. Catharine Whiteside, Dean, Faculty of Medicine and Vice-Provost Relations with Health Care Institutions, University of Toronto Invites surgical alumni, faculty and trainees to a special reception at the 2008 Association of Faculties of Medicine of Canada Conference in Montreal Saturday, May 3, 2008, 5:00 p.m. 7:30 p.m. at the Centre Sheraton Montréal, 1201 Boulevard Rene-Levesque West, Montreal. For more information, contact: jennifer.peng@utoronto.ca

SURGERY LEADERSHIP DAY

Leadership Day will take place Friday, April 4, 2008 at the MaRS Collaboration Centre. Please contact your University Division Chair or Surgeon-in-Chief to apply. For a description of the program, visit www.surgicalspotlight.ca

SURGICAL SPOTLIGHT ONLINE

The Surgical Spotlight is now available online in a new and expanded format with links to additional content. Please take a look and subscribe at www.surgicalspotlight.ca. We welcome your comments and suggestions as we explore this new format.

**DR. K. KRINGLE, ADJUNCT PROFESSOR OF
CHILD PSYCHOLOGY
FAR NORTHERN UNIVERSITY**

Dear Dr. Kringle:

At the regularly scheduled December 24 meeting, the IRB reviewed your protocol, “A Global Observational Study of Behaviour in Children”. While we believe it has many good features, it could not be approved as submitted. If you choose to revise your study, please address the following concerns:

1. You propose to study “children of all ages”. Please provide an exact lower and upper age limit, as well as the precise number of subjects. Provide a statistically valid power calculation to justify this large a study.
2. Your only inclusion criterion is “belief in Santa Claus”. Please provide a copy of the screening questionnaire that determines such a belief. Provide a Waiver of Authorization under HIPAA in order to record these beliefs prior to enrollment in the study. The Board recommends that you obtain a Certificate of Confidentiality as beliefs are sensitive and personal information.
3. You propose to “know when they are sleeping and know when they are awake”. How will this be done? Will children undergo video monitoring in their beds? Will they have sleep EEGs? You list 100 elves as research assistants. Are any of them sleep physiologists?
4. Your primary outcome measure is to “know when they’ve been bad or good”. What standard is being used to determine “goodness”? Do children have to be good all year or just most of the time? What if they have been really, really, good except one time when they hit their little brother?
5. You propose to conduct your research by entering the subjects’ homes through the chimney. Have you considered the damage to the roof, carpeting, etc., that this will cause? Moreover, children are likely startled by your appearance late at night. Please revise your protocol to conduct your home visits between 9 am

and 5pm Monday through Friday with at least one parent being present.

6. You state that compensation for participation will be “sugarplums, candy and toys” for the good little girls and boys. This may not be appropriate for the children with obesity, dental caries, and hyperactivity. Also, your proposal to leave a lump of coal in the stockings of bad children will be unfairly stigmatizing to them individually and as a group. In general, the Board suggests a small token of appreciation for all participants. Perhaps a \$5 Toys-R-Us gift card would be better.
7. The database of good and bad children will be kept “on a scroll at the North Pole”. Please describe the security provisions you have in place to protect the research data. Is the scroll kept in a locked cabinet in a locked room? Who has access to the scroll? Are there backup copies of the scroll and how often are they compared to the original?
8. You mention the participation of “eight tiny reindeer” in your protocol. Please provide the Board with documentation of Institutional Animal Care and Use Committee Approval.
9. Please provide the Human Subjects Protection training dates for Mrs. Claus and the elves.
10. As this study involves prospective data collection and more than minimal risk without prospect of direct benefit to the subjects, informed consent signed by both parents will be required. Please have the consent form translated into every language spoken by the children.

Please submit 25 copies of your revised protocol to the IRB. The IRB will be on Holiday Season schedule for the next 2 weeks. If approved, you will be able to conduct your study sometime in January.

Sincerely,

E. Scrooge, MD – Chair, Institutional Review Board.

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The deadline for the Spring 2008 Surgery Newsletter is March 15, 2008. All members of the Department are invited to submit news items, articles, pictures, ideas or announcements. You may reach us by:

**voice mail: 416-978-8177, fax: 416-978-3928 or
e-mail: jean.defazio@utoronto.ca.**

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

The Department of Surgery

Banting Institute
100 College Street
Room 311
Toronto, Ontario, Canada
M5G 1L5

Editor: Martin McKneally
Phone: 416-946-8084
Pager: 416-790-8372
Fax: 416-978-1911
E-Mail: martin.mckneally@utoronto.ca

Managing Editor: Jean DeFazio
Phone: 416-978-8177
Fax: 416-978-3928
E-Mail: jean.defazio@utoronto.ca

Assistant Editor: Julie Roorda
Phone: 416-946-8084
Fax: 416-978-1911
E-Mail: julie.roorda@utoronto.ca

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A. Defazio
"Miss Eisenhart, considering the weather, I've decided to take the afternoon and February off."

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