

# The Surgical Spotlight

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

FALL 2010



## Transplanting the Human Face



Face transplant pioneer Maria Siemionow

*Should composite tissue grafts, such as face transplants be performed in children?*

Greg Borschel, recently recruited to the Hospital for Sick Children<sup>1</sup> reviewed the world experience with this dramatic and complex intervention.

Thirteen face transplants have been performed for problems such as facial burns, dog bite, bear attack, neurofibromatosis and gun shot wounds. He drew attention to the challenges: as a small donor pool, worse immunological challenges when skin is transplanted, and the surgical, psychological, rehabilitation, patient selection and ethical issues.

Jennifer Flynn, philosopher in residence at HSC and a recent fellow at the Joint Centre for Bioethics carefully laid out the ethical issues:

1. The risk benefit ratio is a challenge because of medical uncertainty, the finite life of the graft, and the probability that children may need a second graft as their body matures;
2. Informed consent is complexified in the paediatric population as parents or other substitute decision makers will be held responsible for the outcome as the child matures.

Consent of the donors also raises questions about potential morally dubious motivation. Parents of a deceased child might “want to look at my child’s face in the future”. Personal identity is closely linked to the face, and social adjustment, especially in the teen years, will be predictably difficult.

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Candidate selection must include careful evaluation of the psychological health of the child following facial trauma. She recommended that the surgical question be referred to the Research Ethics Board in view of the novelty and ethical complexity of the procedure. Finally, the question arises of how badly off the patient will be without a transplant, compared to the potential problems and the prospect of a lifetime on immunosuppression.



Greg Borschel

Maria Siemionow who performed the first successful face transplant in the United States was then introduced by Ron Zucker. Maria used the Mona Lisa to deconstruct the importance of the subunits of the face, the texture, function, the identity, the role of beauty, the range of expression and the impact of the face on social life.

The first challenge that her team faced was the technical challenge, performing face and scalp transplants in Lewis rats. These operations took approximately six and one half hours. She learned that transplanting bone as part of the composite graft brings in progenitor cells which help survival of the graft as the animal becomes a chimera. She added eye, ear and dental components to the graft over a period of ten years and 1000 grafts. The next phase was cadaver studies. She learned that 1192 square centimeters or 52x29 centimeters of skin is needed to cover the human face. She and her colleagues performed cadaver grafts six years before her first human transplant.

The second challenge is the identity issue, much beloved by the media. She worked with different models of a boy and a man's facial bony structure and showed how different the appearance of the same face becomes based on the infrastructure. She and her colleagues studied identity from various aspects. We are identified by our voice, our walk and other characteristics in addition to the face, though the face is the most prominent manifestation of identity.

Maria Siemionow, MD, PhD, was awarded her medical degree by the Poznan Medical Academy in 1974, after which she completed her residency in orthopedics, and then earned a PhD in microsurgery. In 1985, she completed a hand surgery fellowship at the Christine Kleinert Institute for Hand and Microsurgery in Louisville, Ky. Since 1995 she has been Director of Plastic Surgery Research, and Head of Microsurgery Training in the Plastic Surgery Department of Cleveland Clinic.

In 2005, she was awarded a faculty appointment as Professor of Surgery in the Department of Surgery at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University. Most recently, she received an honorary academic appointment as Professor of Surgery at the Medical University in Poznan, Poland.

Dr. Siemionow is the first U.S. physician to receive Institutional Review Board approval for facial transplantation surgery. [http://my.clevelandclinic.org/staff\\_directory/staff\\_display.aspx?doctorid=1735](http://my.clevelandclinic.org/staff_directory/staff_display.aspx?doctorid=1735)

Before carrying out the first human face transplant, she had done one thousand animal transplants, 40 cadaver studies and had 65 publications in top journals, including bioethics journals. She wanted to be sure that when she ventured into the experimental phase in human patients that she “would not be perceived as a Doctor Frankenstein.” Based on her research alone, she was twice voted by the Membership of the American Association of Plastic Surgeons the winner of its highest honour - The James Barrett Brown Award in 2004 and again in 2007. The first human face transplant was not performed until 2008.

Gaining approval from the Institutional Review Board/ Research Ethics Board was another challenge. The Cleveland Clinic board comprised 40 members including scientists, clinicians, lawyers and lay members. She met with them weekly over a period of one year to secure approval.

The next problem was gaining approval from organ procurement organizations such as the Center for Organ Recovery & Education (CORE), The Gift of Life Program in Michigan and LifeBanc in Cleveland. The required travel to the offices of these organizations and presentations to convince their members took 4 years.

Patient selection was the next challenge. The importance of this question is dramatically illustrated by the Chinese patient who had suffered a bear attack. After he was transplanted, he moved too far away from the transplant centre to be rescued. When he deliberately stopped his immunosuppression and switched to herbal medicine, he lost the graft and eventually died. There have been two deaths among the thirteen patients who have received face transplants.

Maria's patient was a formerly beautiful woman who suffered a gun shot wound to the face inflicted by her husband. She had been healthy and stable with a tracheostomy and feeding tube through 23 operations. The cosmetic result of these interventions was unsatisfactory. Other examples of the selection problems included a burn patient who had no available back-up sites for skin grafts if the transplant was rejected, and a cancer patient whose cancer free status would remain questionable, particularly on immunosuppression.

Complex theoretical issues of justification were explored. Should older patents be excluded? In the hand transplant experience of 50 patients, they proved to be poor adapters. The cortical reorganization required was far more successful in younger patients. Should blindness be a contraindication? Patients who are blind cannot see signs of rejection in the mirror. They need constant supervision by another to be sure their medications are correctly administered, and they cannot exercise their face while looking in the mirror, as required for rehabilitation.

The fifth challenge is the team - an enormous interactive group of psychologists, microsurgeons, ethicists, anesthesiologists and others. A total of 30 staff were required for the 22 hour transplant operation. The cost of the procedure, approximately \$500,000, was somewhat lower than the total cost of the 23 reconstructive procedures that preceded it. Following transplantation, Maria's patient

underwent a period of rejection which responded to increased immunosuppression. She now has normal two-point discrimination and thermal sensation at 22 months. She can eat, smile and phonate. The challenges from the media were substantial. Social reintegration of the patient into family and work is also a challenge. There have been only two women among the eleven facial transplantations. The social expectation of facial beauty in women is a biasing factor.



Christopher Forrest

Her work was published last year in *The Lancet*<sup>2</sup>. Overall this 20 year tour de force of scientific and clinical perseverance and humility was a thrilling experience to learn about. It was heard by a packed auditorium and given thunderous applause. She closed simply by saying "you need a face to face the world",

In answer to a question from Christopher Forrest, Maria told us that she is working in the laboratory to develop an antibody which selectively blocks alpha-beta T cells and spares gamma-delta T cells, which are tolerogenic. This approach is now being tested in kidney transplant patients. She is also fusing cells ex-vivo to make chimeric cells for induction of tolerance in rats, and is attempting to develop chimeric cells from human cord blood.

M.M.

1. See also *The Surgical Spotlight*, Spring, 2010, p. 18 or [http://www.surgicalspotlight.ca/Article.aspx?ver=Spring\\_2010&tf=NewStaff](http://www.surgicalspotlight.ca/Article.aspx?ver=Spring_2010&tf=NewStaff)
2. Maria Siemionow, Frank Papay, Daniel Alam, Steven Bernard, Risal Djohan, Chad Gordon, Mark Hendrickson, Robert Lohman, Bijan Eghtesad, Kathy Coffman, Eric Kodish, Carmen Paradis, Robin Avery, John Fung. *Near-total human face transplantation for a severely disfigured patient in the USA*. *The Lancet*, 2009, 374, 9685: 203 – 209

## Surgical Education and Resident Work Hours



David Latter

In 1984, Libby Zion, an 18-year-old college freshman, was admitted to a New York City hospital with fever and agitation. Seven hours later she was dead. Inquiry into the events of the case demonstrated that her treating physician was a sleep-deprived resident. This was felt to be an important causal factor in this

tragedy. The public response was immediate and intense - initiating the move to reform resident work hours.

The first jurisdiction to respond was naturally New York State, which implemented an 80-hour work limit in 1989. It wasn't until 2003 that the Accreditation Council for Graduate Medical Education (ACGME) issued its set of guidelines limiting resident work hours to 80 hours per week. In 2008 the Institute of Medicine issued a report on *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety* that recommended even more restrictions.<sup>1</sup> A subsequent set of ACGME 2010 requirements, which are to go into effect July 2011, have some new restrictions on work hours which will affect surgical education in the US. Some of these requirements include:

- duty hours limited to 80 hours per week, inclusive of moonlighting.
- duty hours of PGY-1s are not to exceed 16 continuous hours.
- PGY-2s and higher are limited to 24 hours of continuous duty.
- in hospital call not to exceed one in three with averaging.

The American College of Surgeons has issued a response to the new ACGME directives that accepts much of the new ACGME proposal but takes serious issue with the 80-hour minimum and the 16-hour shift for PGY-1s. Their argument is cogent and well worth reviewing.<sup>2</sup>

The forces affecting work hours and surgical education in Europe and the UK are even more significant. The 1998 EU Working Time Directive, which took full effect for UK

doctors in training in 2009, limits resident work hours to 48 hours per week! Professor John Temple wrote an extensive report called *Time for Training* that outlines many of the issues and challenges that the United Kingdom medical education enterprise is now dealing with.<sup>3</sup>

In Canada resident work hours are mandated by each provincial – resident association agreement. In Ontario we have never had defined total work hours regulations but we do have our own sets of work time provisions. These include:

- no resident to have 2 consecutive periods of call, unless agreed upon by the resident, the Program Director, and PAIRO.
- no more than 7 nights of in house call per 28 days.
- weekend call of no more than 2 days in 8.
- home call of no more than 1 night in 3.
- After an in-hospital night of call the resident is to sign over and be relieved of duties by 2 hours post call.

Similar to surgery departments around the world, our Department must address the important issues of how resident working hours relate to patient safety, resident well being, surgical resident education needs, supervision and progressive responsibilities, and workforce issues in teaching hospitals.

As you may recall the University of Toronto Department of Surgery applied for and was granted exemption from the “home by 2 hours post call” provision stipulated in the last PAIRO contract, and maintained the provision of “home by noon post call”. This exemption was requested because of our concerns of potential negative education effects if surgical residents are mandated to excuse themselves from the morning elective surgical lists.

There is a growing volume of literature regarding effects of sleep deprivation on cognitive function. It is a reality that cognitive function deteriorates with extended periods without sleep. Some have likened the effect of 24 hours without sleep to having a blood alcohol level of 0.05%.<sup>4</sup> Other studies have shown that interns working in the ICU environment made more errors when working frequent shifts of 24 hours than when they worked shorter shifts.<sup>5</sup>

Paradoxically, in the United States the predictions that the ACGME policy of 2003 reducing residents work hours would result in improved patient safety outcomes have been hard to validate. Studies have shown mixed results with the majority showing no effect.

Surgical education is significantly different from train-



ing in the medical specialties. Our trainees must not only gain the cognitive knowledge of their specialty but also the technical skills. As any sports coach or music teacher knows, technical/manual skills are only learned by repeated practice. Even with maximal use of simulation technologies and skills labs there is no suitable replacement for real life operating room experience. So, it is obvious that at some point if work hours are reduced too much, it will impact on the residents' ability to acquire the required technical skills. I personally believe we are at the tipping point of resident work hours and that any further reduction in work hours will jeopardize resident acquisition of operating room skills.

The Professional Association of Interns and Residents of Ontario (PAIRO) is about to negotiate a new contract, as the current contract ends June 30, 2011. Negotiations for the new contract are set to begin. Unfortunately, when this contract is negotiated there will be no representation from the university at the table to represent the third element of the *resident work – hospital service – resident education* trilogy.

In September the Royal College hosted a symposium on this subject at its annual International Conference on Residency Education. Following this conference Dr. Andrew Padmos, CEO of The Royal College of Physicians and Surgeons of Canada, signaled that the Royal College intends to look into the resident work hour issue in more depth with a pan Canadian forum.<sup>6</sup> As surgical educators, we will participate in this exercise to make sure that our opinion is heard. Our Department will insure that surgery residents' special educational needs are met as Canada moves forward in this discussion.

*David Latter*

1. <http://www.iom.edu/Reports/2008/Resident-Duty-Hours-Enhancing-Sleep-Supervision-and-Safety.aspx>
2. Bulletin of the American College of Surgeons Vol. 95, No 9, Pages 4-7.
3. <http://www.mee.nhs.uk/PDF/14274%20Bookmark%20Web%20Version.pdf>
4. Arndt JT et al. Neurobehavioral performance of residents after heavy night call vs. after alcohol ingestion. JAMA 2005; 294:1025-33.
5. Landrigan et al. Effects of reducing interns' work hours on serious medical errors in intensive care units. NEJM 2004; 351:1838-48.
6. [http://rcpsc.medical.org/news/newsletters/ceo\\_message\\_nov10-5\\_e.html](http://rcpsc.medical.org/news/newsletters/ceo_message_nov10-5_e.html)

## PROMOTIONS AND APPOINTMENTS

**Terrence Yau** (CardSurg) was promoted to full professor of Surgery

**Eric Massicotte** (NeurSurg) has been named Director of Undergraduate Education for the Division of Neurosurgery.

**Julian Spears** (NeurSurg) has been named the Associate Residency Program Director

**Todd Mainprize** (NeurSurg) has been named the Fellowship Director for the Division of Neurosurgery.

**Abhaya Kulkarni** (NeurSurg) together with Drs. Mainprize, Spears and Massicotte will provide a representation across the four hospitals and will be the core of the newly created Neurosurgical Education Cabinet. The Education Committee will be bolstered by resident representation which, as in the past, will continue to be elected amongst the residents themselves.

**Moji Hodaie** (NeurSurg) will be the Division of Neurosurgery Web Editor. She will be assisted by DJ Cook, the resident representative, and Stephanie Neilson.

**Peter Dirks** (NeurSurg) will be the Division of Neurosurgery Research Director.

**Leo Dacosta** (NeurSurg) will be our university representative and director of Continuing Medical Education. This position entails serving the educational needs of both our own neurosurgical faculty and those outside our faculty including non-neurosurgeons and non - physician allied health personnel.

# FORTY THREE NEW RESIDENTS ENTER SURGICAL TRAINING

An outstanding cohort of new residents has beaten the competition to enter the Gallie Program in July, 2010. They have diverse and interesting backgrounds.

The Department of Surgery continues to grow with expansion of the number of trainees in many of the surgical specialties. The expertise and enthusiasm of their teachers and resident colleagues promises that our residents will be the best taught ever.

Forty-three residents have entered the department. Thirty-four have come through the CaRMS match and are Canadian Medical School graduates. Eight have

come through the IMG match and include Canadians who have studied abroad and are returning to Canada for their surgical training as well as Permanent Residents who have obtained their MD in foreign countries and will be practicing in Ontario. One is a visa trainee, who will return to his home country following training. What a great gift this diverse group of bright young minds brings to our department. Welcome new residents!

*Ronald H. Levine, MD*

Director, Postgraduate Surgical Education  
Department of Surgery



Khambati Azizi – US



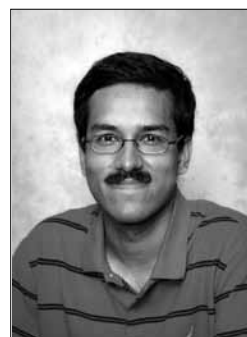
Solomon Azouz- GS



Bellisi Bakinis- GS



Nick Bayley- OS



Vivek Bodani – NS



Hunter Cape – GS



HoMan Cheng – PS



Emily Claydon – GS



Andrew Dold – NS



Brian Drake – NS



Andrew Fagan PS



Laurie Fasola – GS



Eleanor Fung – GS



AnickNater Goulet – NS



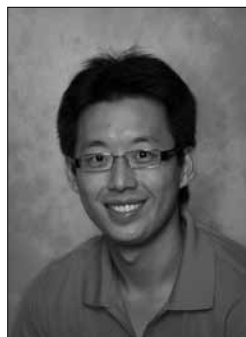
Tyler Gray – US



James Michael Hendry – PS



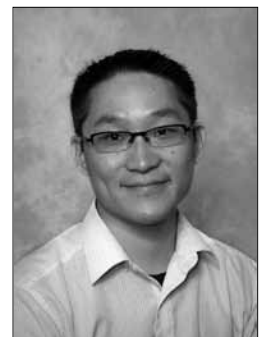
Adam Katchky – OS



Kevin Koo – OS



Pawan Kumar – GS



Anthony Lau – NS



Debbie Li – GS



Marisa Louridas – GS



Giancarlo McEvenue – PS



Ian Mayne – OS



Brent Mollon – OS



Jennifer Muir – GS



Blake Murphy – PS



Ashlie Nadler – GS



Armen Paraghamian – GS



Kashif Parvez – NS



Schethan Sathya – GS



Brian Seeto – OS



Sean Skeldon – US



Matt Strickland – GS



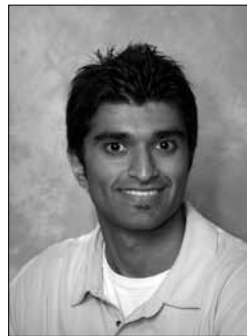
Dimitrios Tsirigotis – CS



Matthew Tsuji – OS



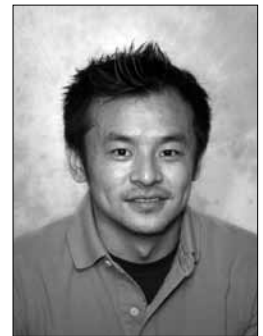
Dmitry Tsvetkov – OS



Raaj Vora – OS



Elliot Wakeam – GS



Jerry Xing – OS



Michael Zywell – OS



*"You smell like a chimney."*

© Danny Shanahan/The New Yorker Collection/www.cartoonbank.com



# Deep Brain Stimulation to Improve the Mind

Andres Lozano's interest in how the brain works led him to functional neurosurgery - studying interventions that can improve function. Well defined areas of the brain control sadness, hunger, memory, motor and sensory processing. It is possible to intervene in the circuits involving these centres, using electricity – “the currency of the brain” to turn off or suppress electrical function. For example, it is possible to interrupt the epilepsy circuit, stopping the disorder. Similarly, the discharge of pain neurons or the 10,000



Andres Lozano

neurons firing four-five times per second synchronously to cause Parkinson's tremor can be interrupted.

Andres studied under Ron Tasker, the world authority on intervention for Parkinson's disease. Following on the success of deep brain stimulation (DBS) in Parkinson's disease, depression has become the next frontier. Area 25 is the sadness centre. When it is in overdrive, evidenced by uptake of radioactive water on a PET scan, the patient is depressed. DBS turns this area down, improving mood. Of 45 patients studied so far, 2/3 were improved.

Tom Insel, who as director of the National Institute of Mental Health enjoys an unparalleled view of the discipline, says “People often ask me about the significance of small first studies like this. I usually tell them: ‘Don't bother. We don't know enough.’ But this is different. Here we know enough to say this is something significant. I really do believe this is the beginning of a new way of understanding depression.”

The study has now moved on to phase III, with 200 patients to be enrolled. All are patients who have failed to improve on drug or electroconvulsive therapy. The study will be carried out in 18 centers throughout North America. The design includes insertion of the electrodes in all patients. Half will be turned on immediately and half will be delayed for six months.

There have been over 80,000 patients treated by DBS for Parkinson's disease. Every major neurological centre

can carry it out, so it would be easy to adapt their systems to intervene in area 25. Unlike the relatively rare diseases treated by neurosurgeons in the past, such as subarachnoid hemorrhage or brain tumours, depression is a common disease. 9% of females and 6% of males are depressed. Of this number, 10-15% are treatment resistant.

These studies led Andres and his colleagues to feel that they are “like space explorers, entering uncharted areas of the brain. Interestingly, there is the same number of neurons in the brain as there are stars in our galaxy. The human brain is the greatest mystery on earth.”

Andres has 100% congruence between his clinical and laboratory interests. In his very active lab, PhD students are studying the effects of DBS at the cellular and molecular level. Since there are known appetite centers in the hypothalamus that have been surgically ablated to destroy hunger, he was asked to try electrical stimulation in treatment resistant morbidly obese patients. During DBS, an obese 53 year old man was asked: “Are you hungry?” An electrode had been advanced into his brain to identify a target where stimulation has an effect in suppressing appetite. However, he experienced a ‘deja vue’ sensation. He said: “I feel like I am 25 years old. I am with my girlfriend, hearing the sounds I heard 33 years ago”. Now, 3 or 4 months later, the same patient has had a dramatic improvement in his verbal memory. This serendipitous finding precipitated an attempt to improve the memory of 6 Alzheimer's disease patients - by stimulating the memory circuit. In this Phase 1 study, the PhD project of neurosurgery resident Adrian Laxton, there was some improvement of memory and it was clear that the intervention could be done safely. The study is now moving on to Phase II. Neurosurgery resident and PhD candidate Scellig Stone has extended these observations and has shown in the laboratory that this stimulation creates more neurons in the hippocampus in animals. The mice become smarter i.e. better at running mazes. Despite years of study, it appears that the characteristic amyloid deposits in Alzheimer's disease (AD) patients' brains are not the entire story. So far clearance of amyloid doesn't improve memory in AD patients and normal people can have amyloid without impairment. In Parkinson's disease there is no increase in cells (neurogenesis) by deep brain electro stimulation, but the performance of the circuit is improved. There

are apparently areas of the brain that are shut down, but can be recovered as evidenced by reestablishment of glucose utilization in the silent areas. “The lights are out, but someone’s at home”. In Parkinson’s disease, there is no increase in neurons. New neurons are generally not generated except in the olfactory system and in the hippocampus.

“The biggest advances in science are made by questioning dogma. The fundamental belief of science is that facts change. Neurosurgeons have access to the human brain, they are uniquely privileged to be able to study and improve its function.”

#### Q:What is your typical day like?

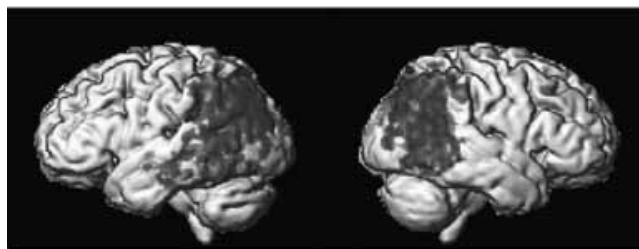
A: “I operate in 2 week blocks, alternating with Dr. Mojgan Hodaie - two weeks in the lab, followed by two weeks of clinical responsibility. There are 3 days of operating in each clinical week. I write and do experiments during the laboratory week. This works out well 90% of the time. I write everyday and everywhere, but finish papers in uninterrupted time.” Dr. Hodaie, who was his resident and fellow, is now his colleague with her own very active research program.

#### Q:What is Neuroethics?

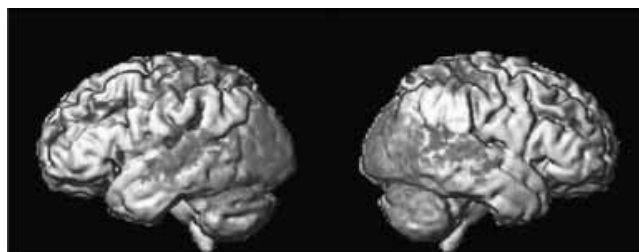
A: This work introduces a new set of ethical challenges, for example: 1. The competence of subjects to consent despite psychological or cognitive illness. 2. The question of change in personality. Certainly there could be a dark side to this, but change in personality is unequivocally accomplishable. 3. Enhancement. Since obese patients’ memory is definitely enhanced as an unintended side effect, the question now is should DBS be offered to improve normal memory? Patients are now requesting this intervention.

There is an international society of stereotactic and functional neurosurgeons. Andres has served as president. There are 500 neurosurgeons in the world doing this work which is not strictly limited to neurosurgeons. It is a multidisciplinary field involving engineers, psychologists, neurologists and others.

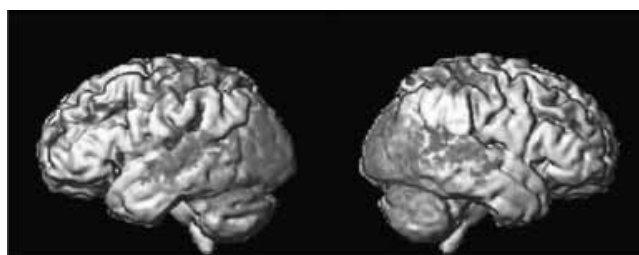
Andres’ wife Marie is a neurologist. They have two boys, Christopher in the 10th grade and Alexander in the 12th grade. Alexander has become fascinated with



Decreased metabolism in AD compared to controls



One month of DBS compared to baseline



One year of DBS compared to baseline

Positron emission tomography scans of 6 patients with Alzheimers disease showing areas of decreased glucose utilization before surgery in blue which are reversed with DBS after 1 month or 12 months of DBS. Restoring glucose utilization suggests that these brain areas that were shut down are once again active.

scientific discovery. He had an epiphany on a Take Your Child to Work Day when he learned in the lab that science is not simply learning what is already known, but more importantly generating knowledge about the things we don’t know. Quoting Yeats, Andres says education should light a fire, not fill a bucket. He is happiest when he is discovering and helping patients. When asked about assuming the role of the Chair of the Neurosurgery Division, he stated that it is an honor to lead what has arguably become the leading neurosurgery division in the world. The challenge is to take it upward from its current exceptional status. “You can’t find a better group of residents and faculty”.

*M.M.*

# Heart Failure, Prostaglandins, and DNA Repair

## THE LISTER AND PETERS PRIZES IN RESEARCH

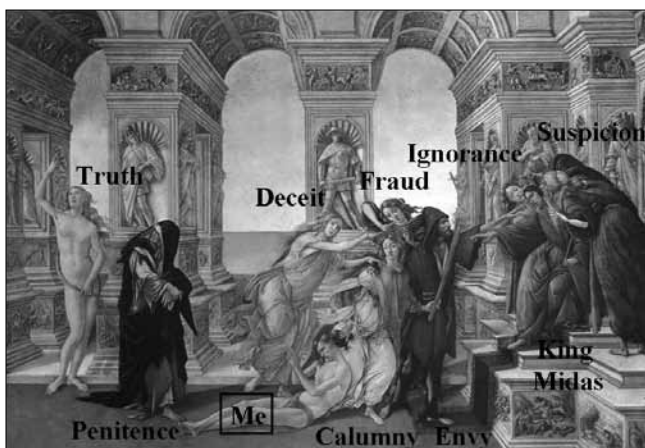


Barry Rubin

**Barry Rubin**, Medical Director of the Peter Munk Cardiac Centre, is also Head of the Division of Vascular Surgery at University Health Network. He received his MD degree from McGill University and his General and Vascular training at the University of Toronto, completing a PhD in experimental medicine in the Surgeon

Scientist Program. The only Wylie Scholar in Academic Vascular Surgery from outside the United States, he has been funded continuously by CIHR for 14 years. He and his wife, Penny have 3 children ([http://www.surgicalspotlight.ca/Article.aspx?ver=winter\\_2008&f=WhatAreAFPs](http://www.surgicalspotlight.ca/Article.aspx?ver=winter_2008&f=WhatAreAFPs)).

He opened with a fascinating discussion of the Calumny of Appelles, a satirical painting by Sandro Boticelli, painted in 1494. The painting shows King Midas surrounded by advisors, Suspicion and Ignorance. Calumny (or slander), dragging an unidentified man by the hair



is approaching the King, led by Envy, and attended by Deceit and Fraud. In the distance is Truth, being gazed at menacingly by Penitence. Barry told us that at the beginning of his research career, he felt like the young man being dragged by the hair, in pursuit of truth but surrounded by uncertainty.

He then noted that his success in research was attributable in large part to his mentors, Paul Walker and Wayne Johnston, and his longtime colleague, Tom Lindsay. He then presented a challenging narrative about the molecular regulation of cardiac myocyte growth by prostaglandins. Prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) is critical in the evolution of cardiac injury following myocardial infarction. The final step in PGE<sub>2</sub> biosynthesis is catalyzed by an enzyme called mPGES-1. Barry showed that mice which lack mPGES-1 have lower levels of PGE<sub>2</sub> and worse left ventricular function after coronary artery ligation. Selectively deleting mPGES-1 in white blood cell, through the use of chimeric mice, also led to worse left systolic and diastolic function after myocardial infarction. This is the first demonstration that an enzyme that controls prostaglandin biosynthesis by white blood cells can modulate the way the heart repairs itself after a heart attack. This body of work has direct clinical implications, as the millions of patients that take an inhibitor of cyclo-oxygenase-2 will be candidates to take inhibitors of mPGES-1, which are currently in clinical trials. Barry closed by acknowledging his network of collaborators in Stockholm, Frankfurt, Boston, Seattle and Toronto, and dedicated his presentation to Drs. Helmut Schmidt (Frankfurt) and Shafie Fazel (Toronto).







Subodh Verma with his son, Raj Subhash and his daughter, Meena

The George Armstrong Peter prize for 2010 was awarded to **Subodh Verma**. Previous winners include William Gallie, Frederick Banting and Charles Tator among others. Subodh received his MSc and PhD from the University of British Columbia and his MD from Calgary. He trained in Cardiac Surgery at the University of Toronto while maintaining an extremely prolific research program. His research has produced over 190 peer-reviewed articles and he is the Canada Research Chair in Atherosclerosis. This year, Subodh was presented with the Howard Morgan Award from the International Academy of Cardiovascular Sciences, listed as one of Canada's Top 40 under 40 (<http://www.theglobeandmail.com/report-on-business/managing/top-40-under-40-2009/subodh-verma-39-ontario/article1591369/>) and simultaneously placed on the India Abroad Power List. His commitment to nurturing the next generation is evidenced by the 2010 Silver Shovel Award (excellence in overall clinical teaching as voted by the University of Toronto medical students), his fervent efforts to bring to life the St Michael's Li Ka Shing Knowledge Institute-King Saud University collaborative partnership and the recent achievements of his trainees at the annual conferences of the American Association for Thoracic Surgery (2010 C. Walton Lillehei Resident Forum winner – Bobby Yanagawa (Cardiac Surgery resi-

dent)), the American Heart Association (2010 Best Basic Cardiovascular Sciences Presentation winner - Young Kim (Cardiology resident), 2009 Vivien Thomas Young Investigator Award winner – Krishna Singh (Postdoctoral Fellow)) and the American College of Cardiology 2009 Young Investigator Award finalist – Praphulla Shukla (Postdoctoral Fellow)).

Subodh thanked Richard Wiesel, Ren-Ke Li, Tirone David, and David Latter for affording him the opportunity to pursue his academic interests throughout his Cardiac Surgery residency. He also expressed his gratitude to his surgeon partners at St Michael's and Surgeon-in-Chief, Ori Rotstein, who collectively made it possible for him to balance a productive research program with the demands of an active clinical practice.

Subodh presented recent findings from his laboratory linking the breast cancer gene *BRCA1* to cardiovascular disease which has culminated in the successful filing of a U.S. provisional patent. In brief, *BRCA1* is a genome-wide gatekeeper of DNA repair that has been widely associated with breast, ovarian, and pancreatic cancer. Subodh's "outside-the-box" line of investigation was conceived after Bill Stanford (IBBME) described to him the high incidence of premature heart failure-associated deaths in a colony of Nbr1 (neighbor of *BRCA1* gene) mouse mutants.

Measurements of *BRCA1* in the heart were initiated and found to be very low in the naïve state, but there were dramatic increases after induction of myocardial infarction (MI). To definitively identify a potential role for *BRCA1* in cardiac physiology/pathology, Subodh generated mice that had one or both copies of the *BRCA1* allele specifically deleted in cardiomyocytes. Compared to the control mice, these animals exhibited a higher incidence of ventricular rupture, impaired ventricular function, extensive wall thinning and greater mortality post-MI. Noteworthy, these are features reminiscent of a human ischemic cardiomyopathic phenotype. From a mechanistic standpoint, Subodh's team went on to discover that the adverse cardiac phenotype observed is *p53*-dependent and involves in part elevated apoptosis and reduced repair of DNA double-strand breaks. That the same unfavourable



cardiac pathology was documented in cardiomyocyte - specific *BRCA1* knockout mice following treatment with the cardiotoxic anthracycline doxorubicin lends credence to the robustness of the notion that *BRCA1* is cardioprotective. Work on three models of human cardiac ischemia – atrial biopsies obtained before and after initiation of cardiopulmonary bypass and aortic cross clamping, ventricular samples from patients with normal coronary arteries undergoing valvular surgery and from those having coronary artery bypass graft surgeries, and human fetal cardiomyocytes subjected to (non-)ischemic conditions – has revealed that *BRCA1* levels are significantly higher in the ischemic group; thereby cementing the clinical relevance and translational potential of this work. Further support stems from recently collected results indicating that derangements in *BRCA1* expression and/or bioavailability may resultantly alter substrate metabolism ensuing in an energy starved heart and predisposition to ischemic and non-ischemic heart failure.

The developing picture of the role of *BRCA1* in the heart is in brief: acute coronary syndrome causes cardiac ischemia which leads to impaired repair of DNA double-strand breaks and increased apoptosis which can result in late heart failure and potentially cardiac death. Accordingly, the clinical implications are that *BRCA1* mutation carriers and their families may be at a previously unrecognized risk of heart failure. This is especially thought-provoking since *BRCA1* deficiency has recently been associated with a significantly increased risk of non-cancer related death via unidentified mechanisms.

Three arms of research within Subodh's team have subsequently sprouted the idea that *BRCA1* and *BRCA2* play an important role in other chronic diseases. With regard to endothelial health, *in vitro* findings support a role for *BRCA1* in inhibiting endothelial apoptosis and in improving endothelial function. Evidence from human atherosclerotic samples show markedly attenuated *BRCA1* levels in plaque areas and gain-of-function studies suggest that *BRCA1*-based cell or gene therapy may represent a novel treatment approach for diseases characterized by endothelial dysfunction, such as atherosclerosis. Led by Hwee Teoh, PhD, an Associate

Research Scientist, the group has also accumulated extensive data demonstrating that *BRCA1* gene therapy not only retards experimental sepsis-associated multi-organ dysfunction but importantly also limits post-sepsis mortality. Preliminary results pivoting around *BRCA2* have started to surface and promise to open yet another avenue of investigation into the relevance of oncogenes in cardiovascular medicine.

Subodh has recently initiated discussions with oncologists at the H. Lee Moffitt Cancer Center in Florida to spearhead a clinical study aimed at prospectively evaluating cardiovascular risks in patients with *BRCA1/2* mutations. This dynamic team together with Steven Narod, the Canada Research Chair in Breast Cancer, is also looking into the potential of retrospectively assessing cardiovascular risks and incidents in existing and ongoing *BRCA1/2* patient registries.

When not focusing on his patients and research, Subodh enjoys and guards his down time shared with his two children and who cannot wait for dog sledding season to arrive.

*M.M. with notes from Barry Rubin and Subodh Verma*



# Surgical Trials and Tribulations

Mohit Bhandari, Associate Professor of Surgery at McMaster University and Canada Research Chair in Musculoskeletal Outcomes presented “Surgical Trials (and Tribulations)” at the Hospital for Sick Children. He opened with a quote from Donald Gannon “where facts are few, experts are many”.

He paid homage to Alvin Feinstein, David Sackett, Jim Wright and Ben Alman, and to the McMaster clinical epidemiology group Clarity, headed by Gordon Guyatt. The Clarity Group fosters evidence based medicine – “the conscientious use of current best evidence for making clinical decisions.” The pillars of EBM are conscientiousness, current best evidence and decision making. EBM has been described as the best advance in medicine in the past 166 years and forms the basis for president Obama’s Current Effectives Research program (CER), intended to guide the health care reforms currently underway in United States.

David Sackett devised the five levels of evidence. The highest level -1 -randomized control trials, 2- prospective trials, 3 -case control trials, 4- retrospective case studies and 5 - opinion. Only 10% of surgical trials are randomized trials and 56% of reports in the surgical literature are level 4 retrospective case studies. Drugs have a very organized pathway into practice, characterized by three phases and generally requiring thousands of patients in phase 3 before they are approved for general use. In sharp contrast devices can enter into the market under the 5-10K requirement of the US Food and Drug Administration. “If the device is deemed substantially equivalent to a currently approved device, it may be marketed immediately in the same regulatory category”. So, acceptable experimental biomechanics gives direct access to the market for new devices. Not surprisingly, many of devices are subsequently pulled from the market as problems or failures are encountered. A recent example is the metal on metal hip replacement.

Randomized trials and metanalysis of randomized trials are increasing in the orthopaedic literature. However, there are a number of problems. Many randomized trials do not report whether the randomization was concealed from the operating surgeons to prevent biased entry of patients to secure a particular treatment assignment. There is a sub-

stantial and important difference in providers’ skills. For example, in the randomized trial of hip fractures, residents did most of the non-replacement operations and consultants performed most of the replacements, resulting in a differential expertise bias. Blinding and loss to follow-up - which can be substantial, are rarely reported.



Mohit Bhandari

Nine of ten orthopaedic randomized trials are underpowered to detect significant effects. This is a sample size problem. Devereaux<sup>1</sup> has developed a thoughtful discussion of “p value fragility” related to minor changes in the incidence of measured events in small trials. The bone morphogenic protein study which showed a very significant 59 percent risk reduction would lose its significance if only three events were switched from the test group to the control group. To eliminate “this implausibility factor”, large trials are required where two or three switches would not affect the p value. To reduce p value fragility, Mo recommends networks with a large number of hospitals in a large number of countries, for example the tibial fracture study conducted by 205 surgeons in 29 countries<sup>2</sup>.

Funders are now stating that “we only want trials that will change practice” This puts an unmanageable burden on investigators to have the preliminary data from a large trial in order to qualify for funding to begin a large trial.

Industry drives innovation. 80% of orthopaedic surgeons have industry ties. The bulk of the money for research is currently going to clinical research organization- globally \$18 billion, an amount that is increasing by 14% annually. It is important that these funds be captured by academic centers as Muhammad Mamdani is trying to do at the Li Ka Shing Knowledge Centre for the University of Toronto.

In order to conduct trials with large numbers of participants it is important for investigators to include China and India where there are large populations (40 % of the world population) and frequent events. In India there are road accidents every three minutes and highway deaths every ten minutes. The challenge is that infrastructure is lacking in these countries. It is difficult to conduct a trauma trial if there is no 911, and no trauma network or registry.

There are ethical issues associated with carrying out trials in developing or lower income countries. For example bone morphogenic protein, studied extensively in South Africa, was simply too expensive and essentially unavailable to South African patients following the FDA approval of the biologic for fracture use. One of the criteria for an ethical trial is the requirement that the agent proven clinically effective by the trial should be available to participants following the trial. For example, Dr. Bhandari discussed an ongoing multinational RCT evaluating the use of high pressure irrigation and soap in open fractures—two simple and inexpensive therapies that could be applied globally if proven efficacious. He concluded with a recommendation that we “think big”, not limit our trials to North America or Europe and emphasize China and India as we expand the use of randomized trials. During the discussion period the problem of surgeons reluctant to admit personal equipoise was raised. “I can’t tell my patients that I don’t know what I am doing”. The solution recommended is discussion of clinical equipoise, the lack of a settled opinion in the informed medical community as to the best available treatment - despite an individual surgeon’s personal preference.

The problem of academic credit was raised by Jack Langer. It is difficult to convince 205 surgeons that they will advance their careers by participating in a trial. This is an issue that universities must confront. Promotions committees have insufficient understanding and appreciation of the role of collaboration. PubMed now uses electronic listing of collaborators, and group authorship is very slowly gaining acceptance. Participation in committees other than the writing committee should be given more weight in the academic setting.

1. Devereaux, P J; Bhandari, Mohit; Clarke, Mike; Montori, Victor M; Cook, Deborah J; Yusuf, Salim; Sackett, David L; Cina, Claudio S ; Walter, S D; Haynes, Brian; Schunemann, Holger J; Norman, Geoffrey R.; Guyatt, Gordon H. Need for expertise based randomised controlled trials, BMJ 2005, 330(2):88
2. Bhandari M, Guyatt G, Tornetta P, Schemitsch EH, Swiontkowski M, Sanders D, Walter SD., Randomized trial of reamed and unreamed intramedullary nailing of tibial shaft fractures. Study to Prospectively Evaluate Reamed Intramedullary Nails in Patients with Tibial Fractures; J Bone Joint Surg Am. 2008 Dec; 90(12):2567-78.

## “Renovating Undergraduate Education”



David Backstein

The Undergraduate Education Program in the Surgery Department is managed by David Backstein, Yaron Shargall and Carmela Calorendi with assistance from the coordinators in each of the three undergraduate academies.

The time available for undergraduate surgical training has been reduced in order to accommodate expanded time for disciplines such as Family and Emergency Medicine and allow for new longitudinal experiences such as the “Clerkship Portfolio”. Nevertheless, the surgery rotation accomplishes a great deal in the 8 weeks allotted over the course of the third year.

David Backstein completed his undergraduate and residency training in Surgery at the University of Toronto, an Orthopaedic Fellowship with Allan Gross and then a John Insall Travelling Fellowship in Knee Surgery, visiting centers throughout the United States. He completed a Masters Degree in Medical Education with Richard Reznick, Michael Cusimano and Carol Hutchinson. David and his wife Marcie have two children Nicholas, 10 and Lauren, 8.

The undergraduate surgery rotation begins with a five day “Crash Course in Surgery” consisting of intensive training using lectures, skills lab simulators and models. An Advanced Trauma Life Support module is conducted at St. Michael’s Hospital organized by Jameel Ali, using the Sim - man trauma simulator. During the Crash Course, students learn to tie, suture, cast fractures, catheterize, perform lumbar punctures, drape and place chest tubes in this intensive and well - coordinated training

program. For example, after a one hour chest trauma lecture, they place chest tubes in a simulator; after the orthopaedics lecture, they are taught how to apply a cast. Following the highly concentrated crash course at the beginning of each rotation, students spend 7 weeks on the surgical wards and in the operating room. Students report that they are more comfortable on the wards after the Crash Course and the evaluations of the program support this. The advantage of this format is that students are not pulled away from the clinical setting to attend lectures intermittently throughout their clerkship. The disadvantage is the intensity of the experience, an overload of information in a short period of time.

While Surgery no longer has rotations in both 3<sup>rd</sup> and 4<sup>th</sup> year, it may take place for an individual student anywhere between September of the third year and December of the fourth chronological year. In this way, all students have been exposed to surgery before the residency match. An additional one month selective in either Surgery or Medicine is mandatory for all students at the end of their final year. In addition to rotations in any of the Surgical subspecialties, surgical selectives will include options in ambulatory surgery, surgical research and rural surgery.



Yaron Shargall

In the new curriculum, students are now evaluated with two centralized objective structured clinical examinations during the clerkship. Within the Surgery rotation they are assessed using the surgical component of the National Board of Medical Examiners (NBME) Shelf exam and a structured oral examination. The NBME

is an excellent exam on which our students do very well. Students get a mid - term evaluation in addition to their examinations. Teacher effectiveness scores are quite high in the Surgery Department with an average of 15 on a scale of 20.

Yaron Shargall has developed a program to integrate undergraduate surgical education into the community hospitals. This program has been very well received by

students and faculty. Carmela Calorendi has been managing the Undergraduate Program for 23 years. She coordinates with Liz Doherty, Michelle Dominey and Renita Yap who manage surgical offices at each of the academies. These coordinators have been very effective in balancing the number of students on electives to control overcrowding.



Carmela Calorendi

The success of the undergraduate surgery program is clearly evident. Historically, about 24% of the U of T graduating class apply to surgical programs.

*M. M.*

## “How Should We Treat Gastric Cancer?”

Surgical oncologist Natalie Coburn from the Division of General Surgery and Sunnybrook Health Sciences Centre hosted an expert panel on Processes of Care of Gastric Cancer on Oct. 21-23<sup>rd</sup> at the Four Seasons Hotel in Toronto. Sixteen experts from six countries specializing in Medical, Radiation and Surgical Oncology, Minimal Access and



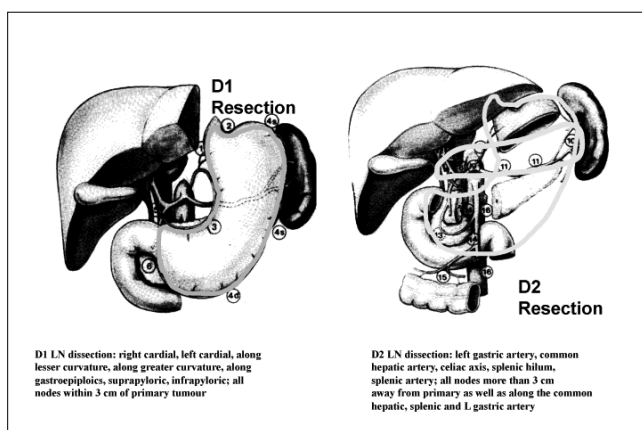
Natalie Coburn

General Surgery, and Gastroenterology participated. A Rand UCLA appropriateness method was used to organize the meeting. The panelists had scored 2000 scenarios and formulated optimal management strategies for the surgical treatment of gastric cancer.

As background, Natalie first completed a literature review on the outcome of treatment of gastric cancer. The results of surgery are highly variable, and remark-



ably better in the Eastern hemisphere than in the West. Asian surgeons tend to overwhelmingly favour D2 resections, illustrated in a nearby figure, whereas Western surgeons, influenced by the high mortality reported in earlier randomized trials, tend to treat the disease less radically. The evidence base for more limited surgery comes from earlier randomized trials in which the post-operative mortality was 10% or more for D2 resections. Proponents of the D2 operation point out that the randomized trials included low volume surgeons with a higher than average mortality.



Slide d1 vs. d2

In the convened expert panel discussion, Dr. Sung Hoon Hoh, a senior surgeon from South Korea, stated that he personally performs 500 gastric cancer resections per year, approximately the same numbers that are performed annually in all of Ontario. The panel agreed that technically challenging minimally invasive resections should not be endorsed unless performed by surgeons with advanced laparoscopic skills and extensive experience in the treatment of gastric cancer. The panel did not endorse resection of the stomach in the presence of metastatic disease unless necessary for palliative reasons.

Gastroenterologist Norman Marcon from St. Michael's Hospital discussed mucosal resections for the earliest lesions, and this was endorsed by the panel. In general, treatment of other gastric cancers by surgery alone was judged to be insufficient. Perioperative chemotherapy or postoperative chemo-radiation treatment were endorsed for all gastric cancers more extensive than T1 N0 lesions. The application of known effective adjuvant treatment

is very much dependent on choices made by the various treatment teams. The addition of perioperative chemotherapy raises the five-year survival from 23% to 36%, and adjuvant chemoradiation increased median survival from 27 to 26 months.

The next step in this important translational research is development of an education program based on outcomes, followed by a study of the program's impact on patients treated for gastric cancer in Ontario. This is the next iteration of the outstanding translational research and education program championed by the Sunnybrook group for treatment of colon cancer patients.

Natalie took her surgical training at Brown University, completed a fellowship in Surgical Oncology at the University of Toronto, and has joined Andy Smith and his colleagues at SHSC and the Odette Cancer Centre, where she specializes in hepatobiliary and upper GI cancer. She conducted her studies under a grant from the Canadian Cancer Society Research Institute and a Ministry of Health Career Scientist Award.

*M.M.*

## Book Review: “Effective Medical Leadership” by Bryce Taylor

Many members of the Department have written or plan to write books, but few will be able to achieve the broad relevance and interest that Bryce Taylor's “Effective Medical Leadership” will generate. In the introduction Bryce tells us that the book is written “for you, the aspiring medical leader” and that he seeks to “get at the essence of effective leadership by medical and surgical professionals”. This he accomplishes with grace and humour. The book is divided into ten chapters which range from a general discussion of leadership to teamwork, personnel, a typical day, quality of care and

risk, planning and execution, data and money, and the individual character of leaders. The book is written in an engaging personal style and includes a list of ninety references.

The content of the chapters is highly relevant to anyone holding or aspiring to a medical leadership position. For instance the chapter “A Typical Day” discusses values, the role of the executive assistant, communication, meetings and committees, unscheduled and one on one meetings, the role of managers, and time management. The chapter on “Other Important Issues” discusses hot button topics such as privacy, media relations, fund raising, the addicted physician, and relationships with industry. The wide range of subjects covered make the book a useful reference for any medical leader - I have already benefitted from using a section of the book to deal with a local issue in my current leadership role.

Anonymized real-life examples are interspersed throughout the book. These vignettes add spice to the text and act as case-studies that amplify the lessons in the body of the chapters. Some of the situations, such as “Cito Gaston, An Effective Leader: Let the Players Play” and “Carl Yastrzemski at Massachusetts General Hospital: A Hero Receives a Hero’s Care” draw on Bryce’s abiding interest in baseball and add engaging readability. Situations such as “The Medical Leader and Fiscal Responsibility: Everyone Supports a Tough Decision” drawn from a difficult personal experience, hits home with those who have been in similar situations. The next generation of medical leaders will benefit from reflecting on how they would handle such challenges in advance of experiencing them first hand. “Doctor J. An Irremediable Situation: Sometimes Surgery is the Only Solution” provides an example of how monumentally challenging some leadership issues can be, and how elusive the solutions are.

Bryce has placed pearls of advice throughout the chapters. Some of my favorites are:

- To apply for something important you have to know what you are applying for
- This is the era of accountability; it is also the era of collaboration and cooperation
- As death is part of life so too is retirement part of a surgical career
- You’ll never have enough hospital resources to do the things you want to do
- When respect is lost, effectiveness is lost

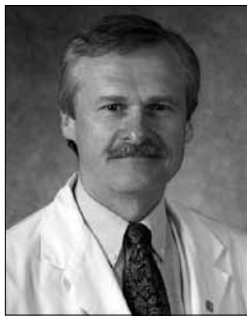
These pithy one-liners provide easily remembered sage advice from an expert. The final two chapters “The Character of a Leader” and “Epilogue: Some Final Thoughts About the Success of Your Leadership” contain a wealth of wisdom learned on the job. Bryce’s advice to be positive, consistent, truthful, honest, appreciative, human, impartial and visible describe a road map for success from a proven medical leader.

I recommend this book to anyone interested in hospital-based leadership. While the context of Bryce’s experience and most of the situations relate to our Canadian health-care system, health care leaders in other jurisdictions will be able to benefit from its depth and universality. Aspiring students of leadership and experienced medical leaders can learn from the book, but I hope that non-hospital and government administrators will also read it to gain insight into the challenges faced by effective medical leaders. Both the content of the book and the style in which it is written are outstanding. Bryce is to be congratulated on an important job well-done.

*Robin Richards*  
*November 2010*

# “Effective Medical Leadership:” Excerpts from Bryce Taylor’s Book

University of Toronto Press 2010  
ISBN 978-1-4426-4200-3; 240 pp



Bryce Taylor

## DECISION MAKING

Of all the professionals in the world today, medical practitioners must be regarded as decision makers above all. Decisions must be made about the differential diagnosis of a patient’s problem, the choice of appropriate investigations, the selection of a number of treatment options, and the continued follow-up of a patient’s progress, including possible additional deviations in a planned course of action. In preparation for those responsibilities, medical faculties educate the future doctor by teaching the fundamentals of basic science; anatomic, physiologic, clinical, and pathologic states; and the advanced therapeutics of a vast array of clinical presentations. Some schools have even addressed the issue by using a problem-based learning approach. This methodology offers frequent practice in the assessment and solution of clinical problems from an early stage in medical education, but does it really promote understanding of the decision-making process that we will use every day? How does the human brain gather information in a standard history from a patient with type 2 diabetes, process that information (along with banks of remote and recently published evidence) in real time, recall years of personal experience with similar but not identical patients with the same affliction, draw conclusions about possible diagnostic possibilities, and then formulate a plan of action for the next steps? All of this may seem like a kind of medical kindergarten, but surprisingly few, including myself, have grappled with the understanding of our actual decisionmaking process.

Conventional teaching may imply that decision making is a mathematical process – information in, information processed along with other information, and then decision out – and some effective leaders may well succeed by

using that approach consistently. But is that really the key to success? I guarantee you that most of the issues you will face as a medical leader will be like reading a new book: the players will be unique, the plot line will be interesting and convoluted, and the conclusion may well be in doubt until the very end. The only problem is that you may be faced with helping to create that end with your decisionmaking ability, and you have neither read that book before nor even heard of such a problem.

A must-read is a book by Jonah Lehrer entitled “How We Decide.” In great detail, Lehrer describes what neuroscientists know about the chemistry of brain function, where decisions seem to be made in the brain, and which of the many factors appear to be important in the process. He describes the fact that our thinking requires emotional input, that our otherwise mathematical approach to solving complex problems requires feeling; he also reminds us that as humans we inherently practice a ‘negativity bias,’ that is, our fear of failure is a powerful motivator when we are making the tough decisions. If this is true, it places the medical leader in a most unenviable position. Taking the safe route to avoid the possible mistake or misguided approach to a problem may well not be in the interests of progress; bold, while potentially risky, may be beautiful!

Just as in morbidity and mortality rounds (see chapter 6), mistakes in management and leadership must be regarded as opportunities for learning. I have often said to my residents that the main reason I am a reasonably good surgeon with acceptable outcomes is that over the last three decades I have made every mistake in the book and tried to learn from each one of them. So too in leadership.

The *feeling* issue described by Lehrer takes me back to the issue of emotional intelligence (‘Involving the “Troops” in Planning,’ in chapter 2) and also the personality profiles of leaders (‘Ensuring Quality of Patient Care,’ in chapter 2). If you think of the typical ENTJ<sup>1</sup> leaders (the field marshals) in your past experience, were they ultimately more successful or less successful than the leaders who may have exhibited characteristics such as sensing instead of intuition, or feeling instead of thinking? Just a thought to ponder.

Being decisive does not necessarily mean that a quick forceful decision by a coercive (commanding) leader is your prime objective. A well thought-out decision with careful assessment of all the factors involved, using the appropriate input from colleagues and mentors and taking whatever

time is necessary (within reason) for a fair evaluation, is, in the end, a reasonable approach, and if those steps become part of your reputation as a decision maker or leader, mistakes will be forgiven. However, just as in the clinical domain, mistakes must be reviewed and analysed, reasons illuminated, and lessons learned, and then you carry on with greater knowledge and wisdom than before.

Lehrer makes a number of observations that may help us as medical leaders to address the apparently complex problem in a more focused way:

- 1 We make decisions using our rational thought, with the prefrontal cortex acting like an orchestra conductor and our amygdala providing a kind of intuition or a 'wisdom of emotions.' The key is not to have emotions take over or to have too much faith in a rational approach and be overwhelmed with detail. Balance is the key.
- 2 We must avoid the assumptions that lead us to discount obvious facts; in other words, we must consider all options, even if they appear to fly in the face of our previous tightly held beliefs. Embrace uncertainty.
- 3 We should consistently think about how we think, and continually study our own decision-making process.
- 4 We should have faith that in our final decisions on a difficult topic our experiences will impart certain abilities and intuitions of which we may not even be consciously aware. This notion is at the root of Malcolm Gladwell's book "Blink", which emphasizes our innate ability to make complex judgments by using our intellect, our intuition, and our past experiences, while not even realizing that we are assimilating vast inputs into a single decision.
- 5 We should accept the fact that our decision making may involve moral judgments and that we may be bound by a feeling of what is right and what is wrong.
- 6 We should welcome dissenting views that can be tested against our own attitudes.
- 7 We should try to avoid being afraid of failure. No one likes to fail, but, as stated, the outcome of a less than ideal decision is an opportunity to learn.
- 8 We should remember that positive and happy people make better problem solvers; the rational brain is therefore not distracted by the noise of discontent, anger, and chaos.

I have often shared with friends and residents my own simple method for making tough life decisions, such as the acceptance of a new demanding position or perhaps a

move by me and my family to a totally new environment and a novel opportunity, both social and professional. This approach is not revolutionary but happens to address both the thinking and the feeling aspects of the decision. First, I take out a sheet of paper and divide the page into two major columns representing the two options, for instance, staying in my city or moving to another organization in another state. Then down the left side I list every possible factor that my family and I can possibly think of when trying to reach a decision, stressing the advantages or disadvantages of each. Then I write down thoughts and feelings on the growing chart, being as specific as possible about the pros and cons of each choice. I carefully assign a 'value assessment' to each of the factors; for instance, being close to in-laws may be a very strong pro factor for staying or may indeed be a very strong pro factor for leaving!

This process so far follows the mathematical tendency of our brain in making calculated judgments. So now my chart is complete: it has the two major options, it has all the factors that weigh in on the final decision, and it has the relative importance of each of those factors. Now we're ready to get the calculator out and decide where we will be next year, right? Wrong! What I do now is, for me, the most important step, which by now may well be the easiest: I tear up the chart and make the decision. I believe very strongly that in such tough life-changing situations we need to carefully use our prefrontal cortex to evaluate all the factors that must be considered, discuss with trusted friends, verbalize and record in writing our thoughts and feelings, and then trust ourselves to make the right choice. Whether this can be termed in the end a gut feeling or a decision from the heart may be a subject for debate, but I believe it will be generated from the marriage of thinking and feeling that Lehrer talks about and will be appropriate for the circumstance.

Such an imperfect science as decision making is brought to bear every day in the life of a medical leader. Decisions are to be made carefully, with all the values held dear, including honesty, integrity, and caring about how the decision will affect others.

1. extroverted, intuitive, thinking, judging

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## Managing Surgical Science



Martin McKneally

In this issue of the Spotlight we report events of the past fall, and celebrate the outstanding Undergraduate Surgical Education Program developed by David Backstein, Yaron Shargall and Carmela Calorendi. We also welcome our new residents to the Department and to the dynamic and complex field of study Surgery has become.

Its complexity is exemplified in the remarkable story of the surgeon scientist Maria Siemionow. Her persistence and scholarship in developing face transplantation- for patients deformed beyond description - exemplifies the leading edge of our specialty. Her November presentation described on page 11 brought tears of pride to the eyes and thunderous applause from a packed auditorium at the Hospital for Sick Children. Her story illustrates the commitment, courage, determination and management skills of a great surgeon. The coordination of a team of 30 in the operating room is only the capstone example of the complexity of the enterprise she managed for over a decade. Its psychological, ethical, legal, organizational and resource issues and the ingenuity required to resolve them could only be described by the surgeon who accomplished this tour de force.

Similarly, the laboratory science program led by Barry Rubin and Subodh Verma (described on page 11) featured collaborating scientists all over the world. As Ori Rotstein remarked, we do not really teach this complex management of science, except by example. Bryce Taylor's excellent book on effective medical leadership presents principles and techniques for managing teams in large clinical organizations. Perhaps his advice can be adapted to the scientific surgical enterprise by one or more of our surgeon scientists who are privileged to work with exemplars like these. The trial of deep brain stimulation coordinated by Andres Lozano will involve surgeons at 18 centres. Natalie Coburn's international expert panel brought together scholars from around

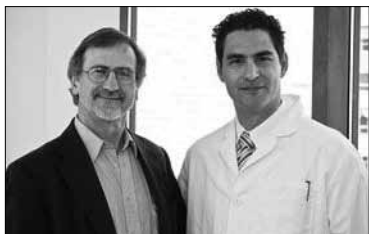
the world, and will soon involve collecting data from surgeons throughout the province of Ontario. Mohit Bhandari's study of tibial fractures and other international trials that he is developing further exemplify the need for skilled management of surgical science on a large scale.

David Latter reminds us that preparing surgeon scientists to lead the world cannot be accomplished without sufficient practice. As a result of the legally mandated limit of 48 hours of duty per week, bright dynamic surgical trainees are leaving the U.K. and Europe for less constricted programs in North America, Australia and the Far East where they can apply their energy and enthusiasm to learning surgical science in its current state of growth and development. The challenge to our department and to surgery in general is to provide the opportunities and role models needed to develop the knowledge skill and judgment that defines outstanding surgeons while maintaining life balance. A recent survey<sup>1</sup> of residents in the United States clearly indicates that renovation of the educational process is needed. These residents believe that limitation of duty hours won't improve their education, will lengthen their training, but will improve the quality of their lives during training. The initiatives underway in our department to renovate the Halstedian training model puts us at the leading edge of surgical education.

A spirited gathering of the families of our department was hosted at our Holiday Party at Far Niente by David and Sharon Latter. As we celebrate how fortunate we are, I encourage you in the giving spirit of the holidays to contribute to your department and your division for the education of our new residents. We wish them well on their entry into the world of surgery and send warm holiday greetings to all of our readers.

1. Drolet, Brian, M.D., Spalluto, Lucy M.D., and Fischer, Staci, M.D. *Residents' Perspectives on ACGME Regulation of Supervision and Duty Hours – A National Survey*, N Engl J Med 2010; 363:e34

## NEW STAFF



Dr. Fuad Moussa (right) with his patient, Doug Boychuk, five weeks after Mr. Boychuk received minimally invasive bypass surgery at Sunnybrook.

**Fuad Moussa** has joined the Division of Cardiac and Vascular Surgery at Sunnybrook Health Sciences Centre in July of 2010. He and his wife, Kathleen have an 8 year old son, Devon.

Fuad grew up, the son of 2 teachers, in the suburbs of Montreal. He went to McGill University where he obtained a BSc in Anatomical Sciences, an MSc. in Anatomy and Cell Biology and his MDCM. After medical school, he went to sunny Florida to complete residencies in General Surgery and Cardiothoracic Surgery at The University of Miami/Jackson Memorial Medical Centre. During this time he was inducted into The Alpha-Omega-Alpha Honor Society and was given the distinction of Resident of the Year on 2 occasions, as a Chief resident in General Surgery and Chief Resident in Cardiothoracic Surgery.

Fuad returned to Canada and completed a fellowship in adult cardiac surgery at Sunnybrook Health Sciences Centre, then joined Sunnybrook as a Clinical Associate. He was certified by The American Board of Surgery, The American Board of Thoracic Surgery and The Royal College of Physicians and Surgeons.

As a Clinical Associate, Dr. Moussa introduced a minimally invasive beating-heart coronary artery bypass program. His first patient completed The Scotia Bank half marathon 18 months after surgery.

His clinical interests include beating-heart coronary bypass, minimally invasive cardiac surgery, aortic surgery and pacemaker implantation. His research interests are



Fuad Moussa with his son Devon

both clinical and educational. Clinically, he is studying the safety and efficacy of minimally invasive coronary artery bypass surgery with the view of developing a hybrid revascularization strategy.

From an educational perspective, Dr. Moussa is developing a simulation-augmented curriculum for training cardiac surgery residents through his work as a Fellow at The Wilson Centre for Research in Education. He is also completing his second Masters degree in Medical Education through The University of Dundee, Scotland.

*Stephen Fremes*



Richard Jenkinson with the family

The Division of Orthopaedic Surgery is pleased to announce the appointment of **Richard Jenkinson** to its staff. We also welcome his wife, Lilian and two sons Gavin and Jack.

Richard was raised in Calgary, Alberta and completed his honours undergraduate biology degree at the University of Calgary. After this, he was transplanted to Ontario where he completed his medical degree with distinction in London at the University of Western Ontario. Developing during these years was a passion for orthopaedic surgery. Richard undertook his orthopaedic residency training at the University of Western Ontario in London. After these 5 years he came to Toronto, to pursue fellowship training in trauma and adult reconstruction at Sunnybrook hospital. This period at Sunnybrook, introduced Richard to a world of challenging trauma which ignited a desire to pursue a career attempting to reconstruct severe injuries and degenerative joint disease.

After fellowship, Richard joined the Sunnybrook and Holland Center team as a clinical associate for 2 years. During this time, he developed a knack for attracting difficult referrals usually involving destroyed joints,

infections or both. While working in Toronto, he found teaching of residents and fellows to be a particular talent and Richard looks forward to taking an active teaching role at Sunnybrook and the University of Toronto division of Orthopaedic Surgery.

When spare time presents itself, Richard spends time with his wife and young family and also enjoys travelling, golfing and photography. Despite rational misgivings, he still can't help but cheer for the Calgary Flames. The sports teams in Toronto have yet to capture his heart.

Richard's clinical practice will be based at Sunnybrook Hospital focusing on lower extremity trauma and at the Holland Orthopaedic and Arthritic Center performing hip and knee arthroplasty. Richard is currently pursuing a master's degree in Clinical Epidemiology at the University of Toronto investigating modifiable factors that may reduce deep infection rates in open fracture patients. His future research program will explore his interests in clinical improvement in trauma and arthritis care and translation of scientific knowledge into widespread clinical practice.

*Hans Kreder*



Osami Honjo

**Osami Honjo** was recently appointed as a new staff surgeon at the Hospital for Sick Children and Assistant Professor of Surgery at the University of Toronto.

Osami graduated from Shimane Medical University in 1997. Subsequently, he worked at Okayama University Graduate School of Medicine and Dentistry where he did

general surgery, cardiac surgery and obtained a PhD. He arrived for a research fellowship in Toronto in November 2004 and worked in the laboratory of Glen Van Arsdell for 2 years. He was productive in assisting in the development of a single ventricle animal model. That laboratory work has led to current work in humans where proof of concept and safety studies are being performed. Beginning in March 2007, he became a clinical fellow in Congenital Heart Surgery for two years and then spent a

year as a cardiac surgical fellow at St Michael's Hospital, Toronto.

Osami has been remarkably productive academically during his research and clinical fellowships. He is first author or co-author on four book chapters and 44 peer-reviewed journal publications - many of them published during his busy clinical fellowships. He has also distinguished himself clinically. During his cardiac surgery fellowship at St Michael's Hospital, he won the 2010 Zane Cohen Clinical Fellowship achievement award. This is an award given to the highest achieving clinical fellow in the University of Toronto surgical system.

Since Osami's appointment as a staff cardiovascular surgeon at the Hospital for Sick Children, he was awarded the Roscoe Reid Graham Scholarship in Surgical Science from the University of Toronto. This award provides a substantial amount of financial support to augment Dr. Honjo's ongoing research efforts.

*Christopher Caldarone*

## ANNOUNCEMENTS

### IN MEMORIAM- DR. COLIN EDWARD BAYLISS

We report with sadness the death of Dr. Colin Edward Bayliss on September 24, 2010. Dr. Bayliss was a former cardiovascular surgeon at Toronto Western Hospital and a Professor at the University of Toronto, where he taught Cardiovascular Physiology.



Colin Bayliss

He was a highly valued colleague and friend at the University of Toronto and an unforgettable presence in the teaching arena. The Department of Physiology has an award in his name for deserving students, ensuring that his presence is still felt. Students, colleagues and fellow health care professionals will undoubtedly miss him. Our thoughts go out to his family during this time of mourning.



Calvin Law

We are delighted to announce the appointment of **Calvin Law** as the inaugural recipient of the Hanna Family Research Chair in Surgical Oncology. Dr. Law was appointed after a search process involving stakeholders from the University of Toronto and Sunnybrook

Health Sciences Centre.

Calvin attended the University of Toronto Medical School and completed General Surgery Training at McMaster. He became a Fellow of the Royal College of Physicians and Surgeons of Canada in 1999. He completed a Masters of Public Health at Harvard University in 2002. Following a clinical fellowship in Surgical Oncology in Toronto, he was then appointed to the surgical staff at the Sunnybrook Health Sciences Centre, and as adjunct scientist at the Institute of Clinical Evaluative Sciences. He is currently an Associate Professor in the Department of Surgery at the University of Toronto, with a cross-appointment to the Department of Health Policy, Management and Evaluation.

In his new role, Calvin will lead and catalyze research in Surgical Oncology. As part of our comprehensive cancer program at the Odette Cancer Centre, establishment of this Chair underscores the central role that cutting-edge research plays in the advancement of the quality of care delivered to our cancer patients.

Please join us in congratulating Calvin on his new role and wishing him every success.

*Andy Smith, Richard A. Wells,  
Michael Julius & David Latter*

**Michael Tymianski** has received a Tier 1 Canada Research Chair in Translational Stroke Research. This prestigious appointment recognizes outstanding Canadian scientists. Michael joins the ranks of a select few surgeons who have attained this level of achievement in their research careers.

Michael joined the Division of Neurosurgery at UHN as a CIHR-Clinician Scientist in 1997. He was trained in Medicine and in Neurosurgery at the University of

Toronto, where he also completed a PhD degree in neuroscience at the Institute of Medical Science with Charles Tator. He completed a fellowship in cerebrovascular neurosurgery at UofT and a second fellowship in cerebrovascular and skull-base neurosurgery, at the Barrow Neurological

Institute in Phoenix, AZ. His practice is centered on the care of patients with complex cerebrovascular and skull base disorders.

Michael is the Medical Director of the Neurovascular Therapeutics Program and acting chief of the division of Neurosurgery at the University Health Network. He is a Professor in the Department of Surgery at U of T and a Senior Scientist at the Toronto Western Hospital Research Institute. He is the recipient of multiple academic awards, and funding from the National Institutes of Health, the Canadian Institutes of Health Research, the Heart and Stroke Foundation of Ontario, the Canadian Stroke Networks, and the Ministry of Research and Innovation. His research has focused on developing novel molecular therapeutics to combat brain ischemia and stroke and prevent neuronal death.

Please join us in congratulating Mike on the honour of this appointment and in conveying our best wishes for ongoing success.

*Andres Lozano & David Latter*



Michael Tymianski

The Department hosted the American College of Surgeons Accredited Education Institutes meeting in Toronto, Oct 29 and 30 2010.

Our 170 attendees from mostly the US and Canada attended a full day of lectures by U of T faculty at the Toronto Convention Centre followed by a full day workshop hosted at the Surgical Skills Centre at Mount Sinai Hospital.

*Lisa Satterthwaite, Manager  
U of T Surgical Skills Centre at Mount Sinai Hospital*



## Chef Gordon Ramsay vs. Aunt Lisa

I recently had the hottest ticket in town - I was invited to the Chef's Challenge: The Ultimate Battle for a Cure, featuring celebrity chef Gordon Ramsay and in support of women's cancers at Mount Sinai Hospital in Toronto.

More than \$1 million was raised, in part by more than 100 self-proclaimed foodies, all vying to be one of the top 50 fundraisers and earning the right to cook with Chef Ramsay himself.

My Aunt Lisa Satterthwaite became one of those lucky individuals by raising a whopping \$9,316!

These 50 fundraiser chefs were divided into five groups of 10 each led by a celebrity Canadian chef, including Lynn Crawford, Mark McEwan, Massimo Capra, David Rocco and Jamie Kennedy. They spent the day with the chefs, learning, preparing and cooking.

Under the pressure - or maybe just the stage lights - Lisa ran into some trouble when the olive oil she was heating ignited causing a huge fire in her pan. Chef Ramsay stepped in, grabbed the pan and heroically threw it in a plastic garbage can (which of course, melted). She immediately earned the nickname Smokey and made it into the highlight reel that was played for guests like me.

When the guests arrived, the challenge was on, with each team preparing three courses for the judges - on stage, in front of 400 people. The pressure was on, but Team Crawford - Lisa's team - now has the bragging rights of winning the first-ever cooking challenge for a cure.

It was a great event, and an out-of-the-box fundraiser that I think will become a signature event for Mount Sinai.

*Lindsay Satterthwaite*  
*Communications Officer, Toronto District School Board*



Lindsay Satterthwaite, Chef Gordon Ramsay, Lisa Satterthwaite



Go Team Crawford!



Lisa on stage with her trophy

# AWARDS/HONOURS/ACHIEVEMENTS

**Subodh Verma** (CardSurg) was selected as the recipient of the 2010 Howard Morgan Award from the International Academy of Cardiovascular Sciences.

**Gilbert Tang** (CardSurg) was a recipient of the 2011 Royal College of Physicians and Surgeons of Canada Detweiler Travelling Fellowship (\$21,000). The fellowship will be for Gilbert to pursue his one-year specialization in complex valve repair and transcatheter valve therapy at Mount Sinai Medical Center in New York.

**Osami Honjo** (CardSurg) was awarded the Roscoe Reid Graham Scholarship in Surgical Science from the University of Toronto.

**Mitesh Badiwala** (PGY5 CardSurg- Supervisor: Vivek Rao) won the prestigious Vivien Thomas Young Investigator Award from the Council of Cardiothoracic and Vascular Surgery at the 2010 Scientific Sessions of the American Heart Association. His paper was entitled "Epidermal Growth Factor Like Domain 7 (EGFL-7) is a novel inhibitor of neutrophil adhesion to coronary artery endothelial cells injured by calcineurin inhibition"

**Jonathan Yeung** (GenSurg resident) received the Vanier Canada Graduate Scholarship.

**Charles de Mestral** (GenSurg resident - Supervisor: Avery Nathens) has been awarded Canadian Association of General Surgeons Research Grant for his proposal titled "Early versus delayed cholecystectomy for acute calculous cholecystitis: Decision and cost-utility analysis."

**Andres Lozano** (NeurSurg) was the recipient of the 2010 Winn Prize Award from the Society of Neurological Surgeons.

**Karen Davis** (NeurSurg) received a Champion of Change Award at the 4<sup>th</sup> National Spinal Cord Injury Conference, Toronto Rehabilitation Institute.

Karen also received a 5 year Canadian Institutes of Health Research Grant for her work on "Pain-Attention Interactions and the Descending Pain Modulation System".

**Michael G. Fehlings** (NeurSurg) was awarded a 2-year McEwen Acceleration Award from the McEwen Centre for Molecular Medicine for the project, "iPS neural stem cells and bioengineered strategies to treat chronic spinal cord injury".

Michael also received a 1-year CIHR Proof of Principle grant for his project "Commercial development of bioengineered therapeutic strategy for spinal cord injury".

**Gelareh Zadeh** (NeurSurg) received the Annual Clinician Scientist Award at the American Society for Therapeutic Radiation and Oncology (ASTRO) Annual Meeting.

Gelareh also received the 2010 Best of the Best Scientific Abstract Award from the American Society for Therapeutic Radiation and Oncology (ASTRO) at the Annual Meeting

**Brian Drake** (NeurSurg) was congratulated for the 2010 New York Academy of Medicine Lewis Rudin Glaucoma Award for his contribution to the award winning article "Y. H. Yücel, M. G. Johnston, T. Ly, M. Patel, B. Drake, E. Gümü, S. A. Fraenkl, S. Moore, D. Tobbia, D. Armstrong, E. Horvath, N. Gupta. *Identification of lymphatics in the ciliary body of the human eye: a novel "uveo-lymphatic" outflow pathway. Experimental Eye Research*, 89: 810-819, 2009", as a summer student.

**Scellig Stone** (NeurSurg) received the American Academy of Neurosurgery resident award for his Ph D related work on deep brain stimulation inducing neurogenesis. This international award is the most prestigious given to a resident by a neurosurgical body and we can all be proud that it has been conferred once again on a resident from the University of Toronto.

**Howard Ginsberg and Cari Whyne** (NeurSurg) received a Commercialization grant from MaRS Innovation for their project entitled: Spinous Process Less Invasive Extendable fusion (SPLINE).

**Shobhan Vachharajani** (NeurSurg) received the Exceptional Trainee Award from the Sick Kids Research Institute.

**Ab Guha** (NeurSurg) received a 2 year grant from the Cancer Research Society for his work on “Aberrations in EGFR in Human GBMs: Novel Diagnostic and Biomarker Strategies”.

**David Cadotte** (NeurSurg) is the recipient of two U. of T. Postgraduate Awards from The Miriam Neveren Memorial Fund and the Joseph M. West Family Memorial Fund.

David Cadotte was also awarded the prestigious Starr Medal.

**Betty Kim** (NeurSurg) was chosen by the EANS-CNS as one of 5 residents in North America to attend The EANS-CNS course on Brain Tumors in Halkidiki, Greece, September, 2010

**Jeff Wilson** (NeurSurg) was selected for a Cervical Spine Research Society Resident/Fellow grant for his project entitled, “Determinants of outcomes from traumatic spinal cord injury: Development of a novel classification system to facilitate clinical trials and improve therapeutic strategies”.

**Teresa Purzner** (resident in NeurSurg) won the second prize in the Horsey competition for work on outpatient craniotomy and lumbar surgery - a controversial and cutting edge topic. First prize went to **Jeff Wilson** for his presentation of the STASCIS trial on early versus delayed spinal decompression surgery in trauma. Congratulations Jeff and Teresa and all neurosurgery residents for a tremendous showing.

**Mark Erwin** (OrthoSurg) was awarded a HansJorg Wyss Foundation Start-up grant (CHF 30,000) in July 2010. Michael Fehlings is a co-investigator on this grant, entitled: “A cellular and molecular strategy to unlock the regenerative reservoir of the notochordal cell: A novel approach to treat intervertebral disc degeneration”. It represents a continuation of Mark’s contributions to the field of restorative/regenerative strategies to

treat degenerative disc disease. He is the recipient of two prior AO-Spine awards.

**Richard Holtby** (OrthoSurg) was the 2010 winner of the Surgical Skills Centre Award for Outstanding Educational Contributions which demonstrates the Centre’s commitment to surgical skills education. The award recognises those individuals who have made exemplary contributions to teaching and learning in the Surgical Skills Centre. This is given out annually at the Gallie Day event.

**Hitesh Modi**, (OrthoSurg Fellow) received the Russel Hibbs Award for the best paper in the Basic Science category “Effect of spinal column shortening on motor-evoked potentials and spinal cord blood flow in pigs”.

**Ralph T Manktelow** (PlasSurg) received the Pioneer of Hand Surgery Award by The International Federation of Societies for Surgery of the Hand at the 11th Triennial Congress on Oct 31, 2010 in Seoul Korea. Since its inception 25 years ago this is the fourth time that the award has been received by a Canadian surgeon. In June, Ralph received the Canadian Society of Plastic Surgeons Lifetime Achievement Award at the Society’s annual meeting in Halifax.

**Siba Haykal** (PlasSurg) has been awarded the CIHR Training Program in Regenerative Medicine Graduate Fellowship for 2010-2011 for her research on transplantation. Siba is in her second year of the Surgeon Scientist Program pursuing a PhD with Tom Waddell and Stefan Hofer as her supervisors.

**Joao L. Pippi Salle** (UrolSurg) has been named Herbie Doctor of the Year from the Hospital for Sick Children’s Herbie Fund. The Herbie fund is a non-profit fund bringing children from all over the world to Sick Kids for treatment that is not available to them in their home country.

The Deadline for the next Surgery Newsletter is February 11, 2011. All members of the Department are invited to submit items, articles, pictures, ideas or announcements.

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

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