OPEN SKIES

Department of Surgery Newsletter

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Dr. Ivar Mendez 3D Brain for Neuromodulation Surgical Planning

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University of Saskatchewan
Saskatoon Health Region
Regina Qu'Appelle Health Region

CHAIRMAN'S MESSAGE

As the freshness of spring can already be perceived in the air, I cannot help but to reflect on the first half of my term as Department Head. My first thought is of gratitude to the many members of the Department that have contributed to the unprecedented growth of Surgery in Saskatoon. Over these past two and a half years, we have recruited 25 new surgeons making us the fastest growing Department of Surgery in Canada.

We have restructured surgical undergraduate education to a well-oiled machine under the leadership of Dr. Trustin Domes. Research in the Department has been given a priority and Dr. Neal Shoman has taken the task of enhancing research productivity by establishing a comprehensive program of research support to our members with a specific focus on resident research. The surgical skills laboratory currently under construction and slated to be open in the fall of 2016 will be a crucial piece in surgical education at the undergraduate and post-graduate levels. Dr. Cole Beavis has been working hard in preparing the curriculum and the organizational structure of surgical skills for the new laboratory.

The Surgical Humanities Program directed by Dr. Francis Christian is thriving and gaining national and international recognition. The Acute Care Program at the RUH is now well established and has been shepherded by Dr. John Shaw since its inception. The Trauma Program Pilot under the co-leadership of our own Dr. Kevin Stevenson and Dr. Rob Woods from Emergency continues to gather data to demonstrate its efficacy and has been crucial in dealing with recent mass-casualty situations. We have for the first time a surgical-oncology group lead by Dr. Gary Groot that will help coordinate our approach to cancer surgical care.

Although several challenges lay ahead on the second half of my term, I can say with confidence that the Department is posed to continue to grow and develop into one of the finest Surgical Departments anywhere.

Ivar Mendez, MD, PhD, FRCSC, FACS
F.H. Wigmore Professor of Surgery

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REFLECTIONS FROM THE CONGO

Dr. Angela Schellenberg, R4
General Surgery Resident

Dr. Angela Schellenberg

It has been two years since I returned from the Democratic Republic of Congo, where I completed a one-month elective in international surgery at Centre Médical Évangélique (CME), an 80 bed mission hospital. Although some time has passed, there are instances that remain vivid in my memory. I can remember a mother with her very sick two year old son, who had just received the news that her son had an advanced unresectable abdominal tumor. She threw herself to the ground, wailing with grief. It is common that patients will present with very advanced disease for which nothing can be done. A Lancet Commission on Global Surgery declares that 5 billion people across the globe have no access to surgical care. Lack of access to surgical care and the inability to pay for hospital fees prevent them from coming to hospital sooner.

My passion for global health developed following my first visit to Africa in 2003. One of my motivations in traveling most recently to the Congo, a place of great unrest and civil war, was to see first-hand the way economic factors influence delivery of health care to Congolese families and to learn about effective ways to make global health more equitable, such as partnerships to provide or teach basic surgical care using feasible, sustainable and safe methods in an environment where resources are scarce.

Children of the Congo

The scrub sink at CME

Dr. Schellenberg & her mentor Dr. Wood in OR

RESEARCH IN SURGERY

NAEL SHOMAN

MD, FRCSC
Division of Otolaryngology, Clinical
Associate Professor, Department of Surgery

Director of Research and Graduate Studies

The systematic production of great academic output is achieved through the establishment and consistent provision of various ingredients, otherwise great productivity cannot be consistently achieved, despite the efforts of great individuals. Building a culture of academic productivity is a long and challenging endeavor. My vision is to build a framework that is accepted and adopted by the institution, its leaders, faculty, and students. As that framework is established, fostering that culture becomes a generational continuum that is more resilient to changes in individual roles and fluctuations in resources.

The focus of my role is on research, but academic productivity entails many aspects, including teaching, leadership roles, and involvement in committees and task forces. I have proposed acknowledgment of this productivity through an Academic Value Unit (AVUN) system that is currently under review. For research, the framework will address mentorship, acknowledgment, and provision of resources. Monthly resident workshops, and seminars that focus on a more specific topic three times a year, have been implemented. Faculty and residents are encouraged to submit every accomplishment, and these will be updated weekly on a redesigned Department research website, and eventually on the Open Skies newsletter. Various resident and faculty productivity and mentorship awards are being established. Aside from the annual Resident Research Day, there will be a Faculty Research Day in September, followed by a Research Retreat Evening that month. A new financial incentive program for residents to encourage research has been approved for implementation with the new academic year in July. Research support has been enforced through the joining of Karen Mosier, Research Coordinator, and other roles are addressed including a dedicated statistician. Resident travel guidelines have been revised to encourage submissions. Likewise, dedicated financial support for research projects has been annually set aside. Ultimately, the focus has been on providing guidance throughout the research process, for example with a regularly updated research manual.

The Department of Surgery holds membership to truly great individuals, and that remains the most valuable of all ingredients that compromise a great institution. The rest only builds on this foundation.

PEDIATRIC RESIDENT RESEARCH

AMANDA HALL

GENERAL SURGERY, R3

2015 Recipient of the Research Trainee Award, American Society for Parenteral and Enteral Nutrition (ASPEN)

How do Aluminum and Lipid Solutions in Infant Parenteral Nutrition Affect Liver Function?

The smallest infants in the neonatal intensive care unit (NICU) are often unable to use nutrients provided by normal feeding, and so their survival depends on being fed through a vein or IV (parenteral nutrition). Unfortunately, if this type of feeding is prolonged, infants risk developing liver damage, known as parenteral nutrition associated liver disease or PNALD. The reasons for this liver damage are still unclear, but it appears to be multifactorial. In my PhD project, supervised by Drs G. Zello and G. Miller, I am investigating two possible factors involved in PNALD: aluminum contamination and pro-inflammatory lipids/fats.

Last year, we conducted a study in the RUH NICU where we discovered that infant parenteral nutrition is still contaminated with aluminum due to the manufacturing process. Previous studies by our research group demonstrated that aluminum damages liver cells and impairs the flow of bile (cholestasis), possibly leading to PNALD. Other research groups have also demonstrated that pro-inflammatory lipids used in parenteral nutrition may cause cholestasis. However, a new lipid mixture with a more 'liver-protective' profile has shown to reduce inflammation and the incidence of PNALD.

In collaboration with Memorial University in Newfoundland, we have carried out experiments using a piglet parenteral nutrition model. These piglets are fed exclusively parenteral nutrition, with a recipe almost identical to that of a human infant. In this parenteral nutrition, we changed either the type of lipid, the amount of aluminum, or both. So far, our results have shown that high levels of aluminum appear to damage proteins that are important in moving bile out of the liver cells. However, when the 'liver-protective' mix of lipids are given this damage is decreased. Our analysis is ongoing, and we plan on learning more about how these transport proteins are impaired. With this study, we hope to demonstrate that liver cells are healthiest when both aluminum contamination and pro-inflammatory lipids are not part of the parenteral nutrition given to infants.

This work was made possible through grants from the Children's Hospital Foundation of Saskatchewan, NSERC, and the University of Saskatchewan Department of Surgery.

POWER OF COLLABORATION IN RESEARCH

(Back Row: John Gordon & Troy Harkness, Front Row: Xia Liu, Terra Arnason & Gary Groot)

What began with a cup of coffee with a colleague that I had known and worked with clinically for years has blossomed into an exciting and fruitful research collaboration. Dr. Terra Arnason is an endocrinologist and researcher with expertise in hormone-derived tumors. She approached me to see if I was willing to work with her, Dr. Troy Harkness, and Dr. John Gordon. Drs. Arnason and Harkness had been studying the molecular biology and genetics of Multi Drug Resistant (MDR) cancer cells for over a decade. Using cell culture and dog models, they had discovered that insulin sensitizing drugs suppress proteins associated with MDR, allowing these cells to be once again susceptible to first line chemotherapy and they wanted to see if their results could be replicated in human tissue. They had a collaboration with Dr. Gordon who had developed a proven technique where human tissue can be xenografted into immunodeficient (i.e., NSG) mice and they were looking for a clinician interested in working with them to recruit patients willing to participate in this research.

We applied for, and received, a SHRF Collaborative Innovation Development grant that has allowed us to begin this work. We have successfully xenografted and maintained tumors from 3 breast cancer patients in NSG mice that were used in our initial pilot studies that have allowed the team to apply for a CIHR grant this year.

A year ago I was approached by Dr. Xia Liu to see if I would be interested in collaborating with her team of scientists at the Light Source. Microbeam Radiation Therapy (MRT) is a highly promising new synchrotron based technology for the treatment of cancer. The technique offers significant potential advances over conventional radiation therapy (RT) by improving cancer patient outcomes while minimizing complications. Still in an early preclinical development phase, Dr. Liu was looking for both clinical expertise and an animal model that they could work with. Drs. Gordon, Harkness, Arnason and I are now working collaboratively with Dr. Liu and her team (Dr. Dean Chapman, Dr. Tomasz Wysokinski, and Dr. Andrew Alexander) to conduct in vivo MRT experiments with the NSG mouse model of human breast tumors that we were using. The results coming from these early experiments are already encouraging.

It has been a great honor to work with these scientists here at the University of Saskatchewan and to do my part in developing new knowledge that will hopefully one day benefit our patients. (Author: Dr. Gary Groot)

COLLABORATION IN PLASTIC SURGERY

Dr. Craig Gendron

Cleft lips and palates are one of the most common disorders seen in children affecting 1 in 750 newborns. These children require specialized care in a multidisciplinary setting.

In Saskatoon, the Central and Northern Saskatchewan Cleft Lip and Palate Program (CNSCP) holds clinics monthly and consists of an amazing, dedicated team of professionals in Plastic Surgery, Pediatrics, ENT, Audiology, Oral Surgery, Nursing, Dentistry, Orthodontics, Genetics and Speech Language Pathology.

Dr. Craig Gendron is a Clinical Assistant Professor in the Department of Surgery and a member of the Division of Plastic Surgery at the University of Saskatchewan. Treating children with facial clefts and craniofacial conditions is his true passion and this was the focus of his fellowship at Cincinnati Children's Hospital. He is also a member of the American Cleft Palate Association and strives to provide the most up to date and advanced cleft and craniofacial care to the children of Saskatchewan.

The surgical care he is ultimately able to provide is wholly dependent on the functioning of this clinic as well as the excellent care from the nurses and Paediatric Anesthisiologists in the operating room and the nursing care on the ward.

The current future goals of the CNSCP include the development of a database to track results and generate research in the area of surgical and peri-operative cleft care; and hosting a weekend event called Camp Trailblazers in partnership with About Face, a Canadian organization promoting the wellness of children born with Craniofacial differences. Currently, Saskatchewan does not have it's own camp but did send 8 kids to the camp in Manitoba in 2015. The current target for a Saskatchewan camp is summer 2017, with a group of medical students leading the way and supported fully by all members of the clinic.

SURGICAL HUMANITIES PROGRAM HIGHLIGHTS

The Surgical Humanities Program under the leadership of Dr. Francis Christian is growing in leaps and bounds. Four issues of the Journal of Surgical Humanities have already been published. The annual Surgical Humanities visual Art Exhibition and Classical Music Concert were a tremendous success. Surgical Humanities Grand Rounds have been presented by several prominent individual in the humanities and arts such as the writer Yann Martel and actor and theatre director Henry Woolf.

The future of Surgical Humanities in the Department of Surgery is bright as more and more members of our department and the University of Saskatchewan are actively participating in the program.

Surgical Humanities Day, Art Exhibition

Surgical Humanities Day, Classical Music Concert