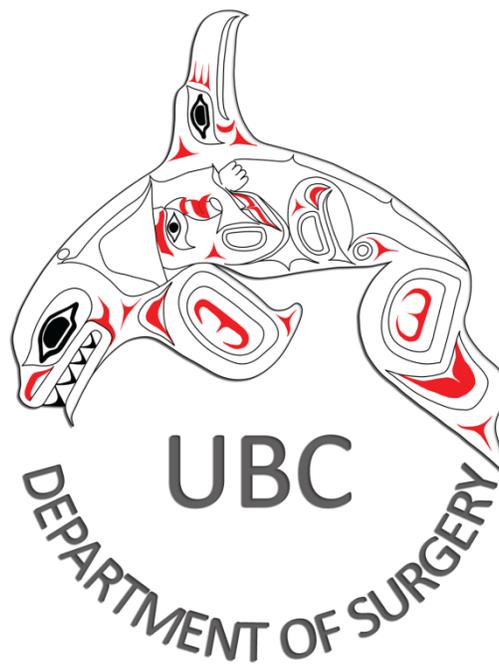




THE SURGICAL TIMES

UBC Department of Surgery

October 2013



The 19th Annual
WB & MH Chung
Lectureship and Research Day

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The Surgical Times is the Newsletter of the Dept of Surgery. The past editors were two distinguished emeriti professors: Dr. Phil Ashmore and Dr. John MacFarlane. With the advent of electronic communication the Surgical Times is now only printed in paper form once a year for Chung Research Day. Special thanks to Ruth Shafron who put together this year's Surgical Times.

Research Day Schedule

Plenary session

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Lunch and Learn

Simultaneous Session A

Paetzold Multipurpose Room, 12:16 -13:20,

Abstract #	Division	First Author <i>Last Author</i>	Abstract_title
A01	Plastic surgery	Nasim Abedi <i>Jugpal S. Arneja</i>	How Many Work Hours are Requisite to Publish a Manuscript?
A022	Pediatric Gen Surg	Geoffrey Blair <i>J Dunlop</i>	Pediatric Surgical Camps as One Model of Global Surgical Partnership: A Way Forward
A03	Plastic surgery	James Boyle <i>James Boye</i>	Bed net related burns at Mulago National Referral Hospital, Uganda: A case series report
A04	Cardiovascular surgery	Erick Carreras <i>Andrew Campbell</i>	Cardiac Strangulation Following Epicardial Pacemaker Implantation: A Rare Pediatric Complication
A05	Plastic surgery	Emily Chan <i>Cynthia Verchere</i>	Minor Surgery Procedures: A Retrospective Chart Review
A06	Plastic surgery	Quinten Clarke <i>Douglas Courtemanche</i>	A n Appraisal of the OPSEI Academic Rounds Evaluation
A07	Plastic surgery	Johnathon Gorman <i>Douglas Courtemanche</i>	Outcomes of Sclerotherapy for the Treatment of Venous Vascular Malformations
A08	Otolaryngology	Joshua Gurberg <i>Sam J. Daniel</i>	Laryngeal Penetration on Modified Barium Swallow is Associated with Increased Pneumonia in Children
A09	Otolaryngology	Al-Rahim Habib <i>Amin R. Javer</i>	The Effect of Head Position on the Distribution of Topical Nasal Medication Using the Mucosal Atomization Device: A Cadaver Study
A10	Neurosurgery	Mike Kerr <i>Paul Steinbok</i>	Review of complications following non-urgent craniotomy: does my patient need to go to the PICU?
A11	Otolaryngology	Divjot Kumar <i>Neil K. Chadha</i>	Chloral Hydrate Sedation for Auditory Brainstem Response Testing in Children: Safety and Efficacy
A12	Otolaryngology	Lauren Ogilvie <i>Frederick Kozak</i>	Tracheostomy at BC Children's Hospital: a Quality of Care 30 Year Review
A13	Otolaryngology	Andrew Thamboo <i>Neil K. Chadha</i>	Can the SNOT-22 and UPSIT Appropriately Select Pediatric Cystic Fibrosis Patients that Should Be Referred to an Otolaryngologist?: Cross-Sectional Study
A14	Plastic surgery	Cynthia Verchere <i>Kim Durlacher</i>	An Early Shoulder Repositioning Program in Birth Related Brachial Plexus Injury

Lunch and Learn

Simultaneous Session B

Paetzold Atrium, 12:16 -13:20,

Abstract #	Division	First Author Last Author	Abstract_title
B01	Radiation oncology	Julianna Caon <i>Michael McKenzie</i>	Radiation Induced Nausea and Vomiting: Are Guidelines Followed, and Why?
B02	General surgery	Tiffany Chan <i>Andrzej Buczkowski</i>	Comparison of orthotopic liver transplantation techniques regarding perioperative transfusion requirements
B03	Radiation oncology	Zahid Delwar	Potency of oncolytic herpes virotherapy is hindered by microglia barrier in glioma
B04	Plastic surgery	Krista Genoway <i>Sheina Macadam</i>	Effects of Chemotherapy and Radiotherapy on Outcomes in Immediate Versus Delayed Autologous Breast Reconstruction
B05	Radiation oncology	Andrea Lo <i>Ingrid Spadinger</i>	The PSA at 4-5 years after Low-Dose-Rate Prostate Brachytherapy is a Strong Predictor of Disease-Free Survival
B06	Radiation oncology	Sarah Lucas <i>Scott Tyldesley</i>	Spinal Instability Neoplastic (SIN) Scores and spinal surgery referral patterns in unselected patients receiving palliative radiotherapy for metastatic disease to the spine
B07	Radiation oncology	Benjamin Maas <i>James Morris</i>	Prostate Brachytherapy: Do Thinner Needles Improve Toxicity and Dosimetry?
B08	General surgery	Brett Mador <i>S. Morad Hameed</i>	Early Versus Delayed Cholecystectomy Following Endoscopic Sphincterotomy for Mild Biliary Pancreatitis
B09	Otolaryngology	Jamil Manji <i>Amin Javar</i>	Cytokine Markers as Predictive Tools in the Treatment of Chronic Rhinosinusitis with <i>Leptospermum</i> Honey
B10	Otolaryngology	Harman S. Parhar <i>Amin Javer</i>	The Inter-Rater and Intra-Rater Reliability of the Philpott-Javer Endoscopic Mucosal Staging System Following Sinus Surgery Based on Level of Training in Otolaryngology
B11	Neurosurgery	Albert Tu <i>Brian Toyota</i>	Resident Migration Patterns
B12	Radiation oncology	Allison Y. Ye <i>Robert A. Olson</i>	Patterns of Radiation Oncology Follow-up in Canada
B13	General surgery	Siham Zerhouni <i>J. Andrea McCart</i>	Analysis of Human Appendiceal Peritoneal Carcinomatosis Infected with Oncolytic Viruses

Lunch and Learn

Simultaneous Session C

Paetzold Lecture Theatre, 12:16 -13:20

Abstract #	Division	First Author Last Author	Abstract_title
C01	General surgery	Samuel Chow <i>J.A. Ehses</i>	Gp130 receptor signalling mediates alpha cell dysfunction in a rodent model of type 2 diabetes
C02	Otolaryngology	Christopher Dickman <i>Cathie Garnis</i>	Title: Exosomal microRNA selection in oral tumorigenesis
C03	General surgery	Nicole Krentz <i>Francis C. Lynn</i>	Using Transcription Activator-like Effector Nucleases (TALENs) and Clustered Regularly Interspaced Short Palindromic Repeats (CRISPRs) to Generate Human Embryonic Stem Cell Reporter Lines
C04	General surgery	Yoo Jin Park <i>Lucy Marzban</i>	The IL-1 Receptor Antagonist Anakinra Reduces Amyloid Beta-Cell Toxicity and Improves Survival and Function of Human Islets: Implications in Clinical Islet Transplantation
C05	General surgery	Alexis Shih <i>Dan S. Luciani</i>	Roles of Anti-apoptotic Bcl-xL in Pancreatic Beta-cell Mitochondrial Physiology and Oxidative Stress
C06	General surgery	Thilo Speckmann <i>Francis Lynn</i>	Mechanisms of Npas4 Induction
C07	General surgery	Annika C Sun <i>Garth Warnock</i>	Novel roles of B7-H4 in beta cell ER stress signaling and beta cell survival
C08	Otolaryngology	Rebecca Towle <i>Cathie Garnis</i>	Identification of Genes Disrupted by DNA Methylation in Oral Cancer Progression Through Integrative Analysis
C09	General surgery	Clara Westwell-Roper <i>Bruce Verchere</i>	Macrophage interleukin-1 secretion mediates human islet amyloid polypeptide-induced islet graft dysfunction and amyloid formation
C10	General surgery	Yun Zhang <i>Lucy Marzban</i>	Three-Dimensional Collagen Matrix Restores Reduced Levels of PKB Phosphorylation Associated with Amyloid Formation in Cultured Islets

Message from the Chair, Dr. John Kestle



Welcome to Chung Day 2014! I am very happy that you are able to join us for the academic highlight of the year. We have a broad range of research expertise in the Department of Surgery and this is our opportunity to showcase what we have accomplished in the areas of basic science, clinical science and education. Please join me in congratulating all of our speakers and thanking them for their work.

In keeping with our increased focus on Patient Safety and Quality Improvement, we are very fortunate this year to have Dr Lorelei Lingard as the Chung Lecturer. Dr. Lingard is one of the world's leading education researchers in the study of communication and collaboration on healthcare teams. She has studied teams in operating rooms, intensive care units, and in a liver transplant program. This is an important topic as miscommunication is a commonly cited source of error in healthcare.

Many people have worked hard to organize today's events. I would like to thank Alice Mui and her team of abstract reviewers for putting together an excellent program, and Ruth Shafron for her logistical support of Chung Day.

Enjoy the presentations and I look forward to seeing everyone at the Awards dinner tonight at the Vancouver Museum.

John Kestle

Chair, UBC Department of Surgery

October 2013

The Benefactors



FOUNDERS OF THE W.B. AND M.H. CHUNG LECTURESHIP

Prior to the establishment of the W.B. and M.H. Chung Research Day, the Dept of Surgery only had Division specific research days. In 1995, the Dr. W.B. and M.H. Chung created an endowment that allows us to hold an annual research day that has become the premier, department-wide event at which we recognize our research achievements

Wallace B. Chung, MDCM, FRCSC, DSc '94

Dr. Chung was born and raised in Victoria, British Columbia. After pre-medical education at Victoria College and UBC, he attended the McGill University medical school and received his M.D. in 1953. Following internship and surgical residency training at VGH and UBC, Dr. Chung was appointed to the Dept of Surgery at UBC as an Instructor in 1960. After being appointed to an Assistant Professor in 1961, Dr. Chung rose quickly through the ranks to become a full Professor in 1972. For his many professional and community contributions, Dr. Chung has received many awards, including being appointed to the Order of Canada in 2005.

- ***Professional Career***

Dr. Chung was noted as a technically gifted surgeon who pioneered Vascular Surgery in Western Canada. In particular, Dr. Chung was known for his excellent surgical results for carotid artery surgery for transient ischemic attacks. He established Vascular Surgery as a new specialty in BC, and as a separate division of surgery at VGH and UBC. He was one of founders of the Canadian Society for Vascular Surgery, and served as its president in 1982. Throughout his academic career, Dr. Chung has taken positions of responsibility (appointed University Head of the Division of General Surgery in 1970, Head of the University Division of General and Vascular Surgery in 1978, Head of the Department of Surgery at the University Hospital in 1981). During his nine year tenure he built the University Hospital Dept of Surgery into an excellent academic unit with international recognition for vascular surgery and gastrointestinal surgery. He was also the Governor of the American College of Surgeons from 1980 to 1986. Dr. Chung has received many awards for his teaching and service, including being honoured by the vascular surgeons of British Columbia with a named day – The Wallace B. Chung Clinical Day.

- ***Community Service***

Dr. Chung has also been an effective and tireless pillar of the community. He has used his extraordinary gifts of wisdom and diplomacy to help advance the integration of the Chinese Community. He was one of the founding executives of the Chinese Cultural Centre of Vancouver serving as Chair from 1983-87. Under Dr. Chung's leadership, the Centre has become a model for other multicultural programs in Canada. Among his other community activities, Dr. Chung is a founding member and patron of the Sun Yat-Sen Gardens, served on the Board of Directors International Dragon Boat Festival Society, and Vice Chair of the Canadian Multiculturalism Council. Dr. Chung's contributions have been recognized by awards (Chinese Cultural Centre Outstanding Achievement Award in 1989 and Chinese Benevolent Association Outstanding Citizen Award in 1990) and his appointment to the B.C. Heritage Trust in 1993.

- ***History Scholar***

An avid reader and collector of first edition rare books, Dr. Chung became a renowned authority and collector of one of Canada's best libraries on the history of the Pacific Northwest exploration and Chinese Canadian immigration. Due to his interest in the Canadian Pacific Steamship Company, Dr. Chung was a guest curator of the Vancouver Maritime Museum for the "Empress to the Orient Exhibition" in 1991. In recognition of this interest, the Vancouver Maritime Museum has named its library, the W.B. and M.H. Chung Library. In 1999 he made a gift of more than 25,000 rare and unique items to the University of British Columbia. The Chung Collection is housed in the Ike Barber Learning Centre (<http://chung.library.ubc.ca/>) and attracts scholars and visitors from around the world.

Madeline Chung, MD, FRCSC

Dr. Madeline Chung was born in Shanghai, China. Her medical education took place at the Yale Medical College of China. She did her internship in Victoria, B.C. followed by specialty training in Obstetrics and Gynecology in Montreal and at the Mayo Clinic in Rochester, Minnesota. Upon coming to Vancouver in the late 1950's, she was the first female and first Chinese-Canadian specialist in Obstetrics and Gynecology in British Columbia. She was appointed as a Clinical Instructor at the University of British Columbia and by the time of her retirement she had delivered over 6,500 babies over a 40 year career, and held the rank of Clinical Professor. Shortly after her retirement from clinical practice she was made an Honorary Life Member of the College of Physicians & Surgeons of British Columbia. Dr. Madeline Chung is also a Clinical Professor Emeritus of the Dept of Obstetrics and Gynecology in the Faculty of Medicine at the University of British Columbia.

- ***Physician***

She was known as a compassionate and empathic physician who gave freely and willingly of her time to her patients, often acting as a counselor to her patients and mentor to the children and adults who she had previously delivered. Frequently, the children she delivered would return to see Madeline years later when it was time for them to have their own babies.

- ***Community Service***

Dr. Madeline Chung extended her philosophy of volunteerism and service to the community in all aspects of her life. Not only was this evident in her professional life but was active in her church and community as well. She served on boards of the Chinese United Church, the Vancouver Academy of Music, and was the founding Executive Director of the True Light Chinese School in Vancouver. Well into her eighties, she was given an honorary graduation certificate from York House School in recognition of her contributions to the school.

- ***Family***

Despite her tireless devotion and dedication to her patients she was still able to balance a healthy family life providing endless support to her husband, Wally, while raising two children who felt inspired enough by their home life to pursue careers in medicine. Their daughter Dr. Maria Chung is in the Division of Geriatric Medicine at the University of British Columbia. Their son Dr. Stephen Chung is the past University of British Columbia Head of the Division of General Surgery and the current Vancouver General Hospital Head of Hepatobiliary & Pancreatic Surgery. Late in her career, she experienced a life-threatening illness but was able to return to full-time work. At the same time, she was the primary caregiver to her elderly mother whom she looked after in her home.

Currently, Dr. Madeline Chung's most enjoyable role is that of a busy grandmother chasing after five active grandchildren.

Chung Lecture 2013

Beyond communication skills: A rhetorical approach to communication for advancing the practice and teaching of teamwork”

Dr. Lorelei Lingard

Professor and Director of the Centre for Education Research & Innovation, Schulich School of Medicine & Dentistry, Western University, London, ON



Dr. Lingard is one of the world's leading education researchers in the study of communication and collaboration on healthcare teams. Her research program investigates the nature of communication on inter-professional healthcare teams. She has studied teams in a variety of clinical settings, including the operating room, the intensive care unit, the internal medicine ward, adult rehabilitation unit, and the liver transplant program. She is particularly interested in how communication patterns influence patient safety, and how learning to talk in sanctioned ways shapes the professional identity of novices.

Plenary Presentations

P01 Lisa NF Aird, General Surgery

Title: Prospective, double blinded, randomized controlled trial comparing electrocautery vs. scalpel for skin incisions: Is there a difference in cosmetic outcome?

Lisa NF Aird, MD, MHSc¹, Sean G Bristol, MD, FRCSC^{2,3}, P Terry Phang, MD, FACS, FRCSC^{1,3}, Manoj J Raval, MD MSc FRCSC^{1,3}, Carl J Brown, MD, MSc, FRCSC^{1,3} ¹Division of General Surgery, UBC; ²Division of Plastic Surgery, UBC ³Department of Surgery, St Paul's Hospital

Background: The use of electrocautery for incising skin is controversial; the primary concern being that thermal injury leads to a cosmetically inferior scar.

Objectives: The aim of this study is to compare cosmetic outcomes between electrocautery and scalpel for laparotomy incisions. The secondary objectives were to determine if wound infection rates and post-operative incision pain are worse with the use of electrocautery.

Methods: A prospective, double blinded, randomized controlled trial compared electrocautery with scalpel for skin incisions in patients undergoing bowel resection surgery. Cosmetic outcome was assessed at 6 months by a plastic surgeon and research associate (both blinded to type of incision) using validated scar assessment tools: the Vancouver Scar Scale (VSS) and the Patient Observer Assessment Score (POSAS). Patients also subjectively evaluated their own scars using POSAS. Wound infection rate at 30 days, and 5-day post-operative incision pain scores were also collected.

Results: 61 patients were randomized to electrocautery (n=30) or scalpel (n=31) incisions. At 6 months there was no significant difference between either electrocautery or scalpel VSS (p=0.903) or POSAS (p=0.698), or in subjective POSAS scar assessment scores (p=0.502). Additionally, patients had no significant difference in wound infection rates between groups (16.7% in cautery and 16.1% in scalpel group, p=1.00). Post-op day 1 pain VAS scores were significantly lower in the cautery group (p=0.018), while days 2-5 were not significantly different.

Conclusions: Electrocautery is a cosmetically acceptable modality for making skin incisions for bowel resection surgery. Additionally, there is no increased risk of wound infection and electrocautery may convey some benefit in early post-operative wound pain.

P02 Sol Gregory, Plastic Surgery

Title: What is the consequence of inaccurate TBSA estimation for major burn patients in rural British Columbia?

Sol Gregory MD, Zi Ye Aileen Tan BSc, Aaron Knox MD, Anthony Papp MD PhD FRCSC Affiliation: UBC Division of Plastic Surgery & UBC Medicine

Introduction: Half the province's major burn patients are assessed and initially resuscitated at smaller hospitals prior to transfer to the quaternary burn centre. This often requires significant lengths of time, during which, effective and accurate resuscitation is critical to outcome.

Objectives: To examine the accuracy of burn extent estimation and fluid resuscitation at rural BC hospitals and compare outcomes with patients initially treated at VGH.

Methods: A retrospective database and chart review gathered information on all major burn patients over 18 years of age with > 15%TBSA injury admitted to Vancouver General Hospital (VGH) between Jan. 2001 and Dec. 2010.

Outcomes of patients initially treated at other hospitals throughout the province prior to transfer to VGH were compared with outcomes of patients initially treated at VGH. Demographic information, burn extent estimation and complication rates were collected and compared between groups controlling for factors known to affect patient outcome.

Results: 72.5% of peripheral patients had their burn extent over estimated by an average of 10%TBSA. Over the first 24 hours post major burn patients transferred from rural communities received, on average, an additional 205cc of fluid per hour compared to central patients (p=0.16). In addition, peripheral patients were 6 times more likely to develop abdominal compartment syndrome requiring laparotomy.

When outcome differences between rural patients with over-estimated burn extent and patients initially treated in Vancouver were controlled for age, %TBSA, inhalational injury and substance abuse, the rural patients had an odds ratio of developing abdominal compartment syndrome 45 times that of the VGH patients.

Conclusion: Resuscitation practice for major burn patients in British Columbia is consistent with the well-documented North American trend toward over-resuscitation. Similar deleterious effects of fluid overload have been published in the literature over the past 10 years. In response to this observation and need for improved care, a multidisciplinary collective was assembled resulting in BC's first provincial clinical practice guideline for major burn patients.

P03 Adelyn L. Ho, Plastic Surgery

Title: Prevalence of Antibiotic Resistant Organisms in a Tertiary Burn Unit: A Retrospective Study of 340 burn patients.

Introduction: The rate of antibiotic resistant organisms (AROs) acquisition in burn units continues to increase and contributes significantly to morbidity and mortality in burn patients. Contact precautions (CP) was implemented after an outbreak of multi-drug resistant *Acinetobacter baumannii* in 2008. The burden of AROs in burn patients admitted to the Burns, Plastics, and Trauma Unit (BPTU) has not been described previously and the impact of CP on AROs has not been evaluated.

Objective: 1) To determine the prevalence of AROs among patients admitted to the BPTU, 2) to describe the impact of CP on AROs, and 3) to identify potential predictors of AROs acquisition.

Methods: Data of burn patients admitted between 2006 to 2010 were retrospectively reviewed. The antibiotic susceptibility profiles of burn patients who developed ARO colonization/infection at or after admission were reviewed in detail. The AROs of interest included MRSA, VRE, extended-spectrum beta-lactamase (ESBL)-producing E-coli, and Carbapenem-resistant *Pseudomonas/Acinetobacter* species. The pre-CP group included patients admitted between 2006-2007 and the post-CP group included patients admitted between 2009-2010. Univariate and multivariate logistic regression analysis was employed with the p-value set at 0.05.

Results: There were 362 admissions during the defined study period. Of these, 340 patients had complete data for analysis. The mean age was 41.8 years and the majority was of male gender. Among the AROs, the most prevalent was MRSA (75%). Prior to CP, the prevalence of all AROs was 27.9%, compared to 27.6% after policy implementation. There was a trend towards an increase in VRE and Carbapenem-resistant *Pseudomonas* isolates and a decrease in Carbapenem-resistant *Acinetobacter* isolates after CP. ICU stay, >20% TBSA burns, and surgical management were significant predictors of ARO acquisition.

Conclusion: This is the first study to describe the ARO profile of burn patients admitted to our burn unit. Our results suggest that the implementation of stringent infection control policies may not significantly reduce the frequency of AROs among this compromised population. However, CP for patients transferred from the ICU, requiring surgery, and large burns may be of benefit.

P04 Jennifer Higgins, Cardiovascular Surgery

Title: Influence of Peri-operative Stroke on Mortality Following Cardiac Surgery

Jennifer Higgins, James G Abel, Jamil Bashir, Division of Cardiovascular Surgery

Background: Stroke remains an infrequent, but potentially devastating, complication following open heart surgery. Recent literature has resulted in a heightened awareness of the risk of peri-operative stroke following cardiac surgery. However, the resulting influence of such strokes on survival in the modern era remains unclear. The primary objective of our study is to assess, at the population-level, the influence of peri-operative stroke on long-term survival following coronary artery bypass grafting (CABG), valve, and combined CABG/valve surgery in British Columbia.

Method: The provincial cardiac surgery database was accessed to identify all adult patients undergoing first-time CABG, valve, or combined CABG/valve surgery in British Columbia between 2007-2011. The registry was linked with the Discharge Abstract Database to determine the incidence of stroke in the first 30 days following surgery. For each of the three different types of surgery, the Student t and χ^2 tests were utilized to compare baseline characteristics, pre-operative risk factors, and intra-operative variables for stroke and non-stroke patients, as appropriate.

The registry was also linked with Vital Statistics to determine rates of mortality. Kaplan-Meier analysis and the Log-rank test were used to compare survival between the stroke and non-stroke groups to 1 year, for each of the three surgical procedures. Finally, a Cox Proportional-Hazards model was employed to identify independent predictors for late mortality among patients developing a peri-operative stroke following cardiac heart surgery.

Results: Between 2007-2011, 14,038 patients underwent primary CABG, valve, or combined CABG/valve surgery in British Columbia. The peri-operative stroke rate was 1.6% among CABG patients, 2.2% among valve patients, and 3.6% among combined CABG/valve patients. Kaplan-Meier analysis revealed that stroke within the first 30 post-operative days resulted in significantly decreased survival compared to no stroke (Log-Rank $p < 0.0001$). This decreased survival among patients developing a stroke persisted during follow-up to 1 year, across all 3 types of surgery.

Conclusion: In summary, the incidence of peri-operative stroke remains low following CABG and valve surgery. However, among those who develop a stroke, the risk of mortality is significantly increased, and remains elevated for at least 1 year. This highlights the need for further research into the prevention and treatment of peri-operative stroke following cardiac surgery.

P05 Al-Rahim R. Habib, Otolaryngology

Title: 5-, 10- and 20-degree Reverse Trendelenburg Position during Functional Endoscopic Sinus Surgery: A double-blind randomized controlled trial

Eng Cer Gan, Al-Rahim R. Habib, Alykhan Rajwani, Amin R. Javer St. Paul's Sinus Centre, Division of Otolaryngology, Faculty of Medicine, University of British Columbia

Background: Utilizing the Reverse Trendelenburg Position (RTP) during functional endoscopic sinus surgery (FESS) is a safe, simple and cost-free method that has been found to reduce intraoperative blood loss. However, the critical angle of RTP that produces the least amount of intraoperative bleeding without compromising surgical technique and safety remains unanswered.

Objective: To assess the effects of 5, 10 and 20 degrees RTP on intraoperative bleeding during FESS

Methods: This double blind randomized controlled trial involved 75 patients with CRS with and without nasal polyposis undergoing FESS. Twenty-five patients were enrolled into each arm; 5-, 10- and 20-RTP. Boezaart endoscopic field-of-view score (BS), total blood loss (TBL), mean arterial blood pressure (MABP), operating time and blood loss per minute were recorded. An intention-to-treat analysis was utilized with a Bonferroni adjustment for multiple comparisons.

Results: Intervention groups were comparable in age, sex, nasal polyposis and disease severity. Mean values of BS and TBL for 5-RTP (2.0, 231ml), 10-RTP (1.8, 230ml) and 20-RTP (1.4, 135ml) were compared. Means significantly differed for BS ($p < 0.01$) and TBL ($p = 0.03$). Significance was not found in mean MABP ($p = 0.85$), operating time ($p = 0.10$) or blood loss per minute ($p = 0.11$). Pairwise comparison between 5- vs. 20-RTP found significant difference in BS ($p < 0.01$) but not TBL ($p = 0.05$). Significance was not found in similar comparisons between 10- vs. 20-RTP and 5- vs. 10-RTP ($p > 0.05$).

Conclusion: FESS in the 20-RTP position produced the best Boezaart endoscopic score and lowest blood loss during FESS without compromising surgical technique.

P06 Stranger, Jennifer, Pediatric General Surgery

Title: Practice Variation in Gastroschisis: Factors Influencing Closure Technique

Jennifer Stanger, Noosheen Mohajerani, Erik D. Skarsgard, the Canadian Pediatric Surgery Network (CAPSNet)

Background: Little is known about the factors influencing surgical practice variation in newborns with gastroschisis. The purpose of this study was to correlate prognostic variables with the intended and actual abdominal closure technique and assess related outcomes.

Methods: GS cases were abstracted from a national database. Variables evaluated included GA, BW, bowel injury severity (GPS), neonatal illness severity (SNAP-II), inborn status, center volume and training status, and admission time. Evaluated outcomes by closure method included duration of TPN, LOS and complications. Descriptive, univariate, and multivariate analyses were conducted.

Results: The cohort consisted of 679 patients: 372 (55%) underwent attempted PR, of which 300 (81%) were successful, while 307 (45%) had a silo placed intentionally. Patients undergoing attempted PR were more likely to be inborn, have daytime admissions and higher SNAP-II scores. Successful PR was predicted by low risk GPS and high volume center. With the exception of higher rates of SSI in the planned silo group, outcomes in the successful PR and planned silo groups were comparable.

Conclusion: Practice variation related to type of closure is predicted by situational and institutional factors (outborn, nighttime admission, and center volume), while outcome variation is attributable to patient factors rather than practice variation.

P07 Nori L. Bradley, General Surgery

Title: Communication of critical clinical data during inter-hospital transfer of major trauma patients in BC

Nori L Bradley¹, Naisan Garraway^{1,3,4}, Jennifer Li², Nasira Lakha³, Richard Simons^{1,3} & S. Morad Hameed^{1,3}

¹University of British Columbia, Faculty of Medicine, Division of General Surgery² University of British Columbia, Faculty of Medicine, Undergraduate³ Vancouver Coastal Health Trauma Services⁴ Canadian Forces Trauma Training Centre (West)

Background: Vancouver General Hospital (VGH) is the only Adult Level I Trauma Centre in British Columbia. Each year, 200-300 major trauma cases require transfer to VGH for definitive care. Currently, there is no standardized process or mandatory documentation for patient transfers. Lack of standardized handover processes have been linked to adverse events.

Objective: To characterize the communication of critical clinical data elements during inter-hospital transfer of major trauma patients in BC.

Methods: A retrospective audit of both the BC Trauma Registry and patient charts was conducted for all major trauma patients (ISS \geq 16) transferred to VGH from April 2011 to March 2012. Communication of critical clinical data (ATLS variables, AMPLE history, transfer summary) was objectively assessed via audit of both the BCTR and patient charts. The quality of documented clinical data was subjectively assessed via patient chart audit.

Results: Overall, 243 major trauma patients required transfer to VGH for management; communication via documentation was sub-optimal. Paramedic forms were not sent with the patient chart in 43% of transfers. Primary Survey data ("ABCs") were missing in 17-23% of transfers. Glasgow Coma Scale and Temperature were not documented in 26% and 40% of transfer documents, respectively. Quality of transfer summaries from sending clinicians revealed inadequacies in documentation of injuries, interventions, past medical history, medications, and providing contact information for next of kin and attending physician.

Conclusion: The current process for transfer of major trauma patients in BC is sub-optimal, inefficient and high risk for adverse events. A standardized trauma transfer protocol may improve patient safety.

P08 Jens Vent-Schmidt, General Surgery

Title: A CARismatic Chief of Police – Engineering Antigen-Specific T Regulatory Cells to Treat Inflammatory Bowel Disease

Jens Vent-Schmidt¹, Rosa Garcia¹, Katherine G MacDonald¹, Jacqueline Siu¹, Tessa Van Tol¹, Theodore S. Steiner², Paul C. Orban³, Megan K. Levings¹ ¹Department of Surgery and ²Department of Medicine, ³Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, BC, Canada.

Background: Inflammatory bowel disease (IBD) is an autoimmune disorder that causes inflammation and ulceration of the small and large intestines. It consists of at least two separate disorders; Crohn's disease (CD) and ulcerative colitis. In IBD, the balance between conventional T-helper cells (Tconv) which clear out pathogens and regulatory T-cells (Treg) which mediate tolerance to self-, food- and commensal antigens is disturbed and substantial data suggest that Treg are defective in IBD. The imbalance allows Tconv to pathologically respond to components of commensal bacteria, such as flagellin, which results in intestinal inflammation. Flagellin-reactive T-cells have been found to induce colitis in immunodeficient mice. In addition, T-cells of adult human CD patients but not healthy adults were shown to respond to flagellin. Adoptive cell therapy with Tregs was shown to reduce colitis in mouse models. However, large numbers of Treg are required to mediate this effect and obtaining sufficient numbers of antigen-specific Tregs remains a challenge. Chimeric antigen receptors (CAR) are artificial receptors that can activate T-cells in the absence of a classical T-cell receptor signal. The heavy and light chains of an antibody, which is directed against the antigen of interest, are fused and linked to the intracellular signaling domains from CD28 and CD3 ζ . CARs are then transfected into the T-cells and expressed at their cell surface. Recognition of the antigen and crosslinking of several molecules of CAR leads to the activation of the T-cells.

Hypothesis: Engineered Tregs specific for flagellin will potently suppress inflammation in IBD and provide a feasible way of developing a novel Treg based cellular therapy to treat IBD.

Methods: We created a FliC-CAR from the single chain antibody from the relevant portions of the anti-FliC heavy and light chain immunoglobulin fused to the intracellular signaling domains from CD28 and CD3 ζ . The surface expression of this FliC-CAR was assessed by FACS, as was its ability to bind to flagellin-coated beads. The next steps will be to determine the ability of FliC-CAR expressing Treg to suppress Tconv and finally to treat experimental models of colitis.

Results: We could show the expression of the FliC-CAR on HEK 293T cells as well as on Treg and Tconv. Specific binding to flagellin-coated beads was confirmed and we were able to show that FliC-CAR transfected Treg, as well as Tconv, were specifically stimulated by flagellin.

Conclusions: Our results provide the first step for the development of the generation of novel therapies to treat IBD. The binding and the proliferation assays provide important insight into the general capability of CAR to confer functional antigen-specificity for flagellin to Treg.

P09 M. Dan, General Surgery

Title: The role of macrophages in the regulation of islet inflammation and β cell function by TLR2/6 and TLR4 ligands

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Background: Chronic inflammation mediated in part by infiltrating islet macrophages contributes to pancreatic β cell dysfunction in type 2 diabetes. Both toll-like receptor (TLR)-2 and -4 ligands are increased in the circulation of type 2 diabetes patients, and both TLR2 and TLR4 deficient mice are protected from the metabolic consequences of a high fat diet.

Objective: Here we investigated the cell types responsible for TLR2/6- and TLR4 ligand mediated effects on islet inflammation and β cell function, with a focus on macrophages.

Methods: Wild type mouse islets, mouse TLR2^{-/-} islets, mouse TLR4^{-/-} islets, purified rat β cells and human islets were analyzed. Resident islet macrophages were depleted from islets using clodronate-loaded liposomes and sorted by flow cytometry for gene expression analysis. Effects of TLR2/6 and TLR4-activated bone marrow derived macrophages (BMDMs) on β cell function were determined. A TLR2 neutralizing antibody and TLR4 small molecule inhibitor, TAK-242 were used to inhibit TLR ligand effects.

Results: Resident islet macrophage depletion and activation of purified islet macrophages confirmed that these cells contribute to TLR2/6- and TLR4-induced islet cytokine expression in both mouse and human islets. TLR ligands also reduced insulin gene expression independently of resident islet macrophages, and via indirect actions on β cells. TLR ligand activated BMDMs reduced β cell insulin secretion and *Ins1*, *Ins2*, *Pdx1* mRNA expression. TLR2 neutralization or inhibition of TLR4 signalling reversed direct ligand effects on islet inflammation and β cell gene expression, and effects of activated BMDMs on β cell gene expression.

Conclusions: We conclude that resident islet macrophages are major contributors to islet inflammation in response to TLR2/6 and TLR4 ligands in both mouse and human islets. In addition to direct effects of TLR ligands on insulin gene expression, chemokine-induced attraction of TLR2/6- and TLR4-activated macrophages further impairs β cell function. Inhibition of TLR2 and/or TLR4 signalling may reduce islet inflammation and improve β function in type 2 diabetes.

P10 Reza B. Jalili, Plastic Surgery

Title: Long-Term Reversal of Autoimmune Diabetes in Non-Obese Diabetic Mice via a Novel Cell Therapy Strategy

Reza B. Jalili, Ruhangiz T Kilani, Yun Zhang, Azadeh Hoseini-Tabatabaie, Yunyuan Li, Garth L Warnock, and Aziz Ghahary, Department of Surgery, Divisions of General and Plastic Surgery

Introduction: Curbing autoimmunity via Immunological interventions at the initiation of type 1 diabetes (T1D) can result in recovery of residual β cells and consequent reversal of diabetes. To replace current insulin replacement therapies with a cure, T1D immunotherapeutic interventions should ideally be highly effective, long-lasting, and more importantly safe.

Objective: To address the shortcomings associated with current T1D therapies, we have developed a novel immunomodulatory cell therapy model.

Methods: Metabolism of tryptophan through indoleamine 2,3 dioxygenase (IDO) pathway plays a crucial role in maintaining the balance between inflammation and immune tolerance. In our model, genetically modified IDO expressing or control fibroblasts were injected intraperitoneally to non-obese diabetic (NOD) mice at the onset of overt hyperglycemia. Mice were then monitored for reversal of hyperglycemia, improvement of diabetic markers, and changes in inflammatory / regulatory T cell repertoire.

Results: Hyperglycemia was reversed in 82% of mice that received single injection of IDO cells while all control mice remained diabetic. Long-term diabetes-free status was maintained in IDO treated mice for over 400 days. Histological examination revealed decreased insulinitis and functional islets in IDO treated group. Splenic CD4+ CD25+ FOXP3+ Tregs were increased from $4.68\% \pm 1.01\%$ at the onset of diabetes to $16.04\% \pm 1.16\%$ ($p < 0.001$) following IDO cell therapy while no change was seen in the control group. The same pattern was found in the pancreatic lymph node Tregs. On the contrary, frequency of Th17 cells and β cell specific autoreactive CD8+ T cells were significantly decreased in both spleen and pancreatic lymph nodes of IDO treated mice compared to those of the control mice. We further showed that fibroblasts expressed co-inhibitory programmed cell death ligands and anti-inflammatory IL-1 receptor antagonist.

Conclusion: These findings suggest that boosting tryptophan catabolism by IDO in NOD mice efficiently reinstates self-tolerance and alleviate β cell autoreactivity, resulting in long-term reversal of diabetes. This promising finding opens new avenues for development of a cure for T1D.

P11 Erin Brown, Plastic Surgery

Title: Resident participation in surgery: Divergence of surgical educators actions and behaviour and patients expectations

Erin Brown, Joline Choi, UBC Division of Plastic Surgery

Background: As surgical educators, we need to balance the training of our future colleagues against the best possible outcomes and expectations of our patients. A previous study of 105 patients within 6 weeks following their surgery demonstrated that if specifically asked, most patients would agree to have a resident assist in their surgery, but the majority would not agree to have the resident perform the surgery. Patients also indicated that they would be upset if they subsequently found out that Residents assisted or performed their surgery without their specific consent.

Objective: To determine if surgeon attitudes and reported behaviours are consistent with patient expectations regarding the role of resident involvement in their surgery.

Methods: Online surveys were provided to 333 members of the Canadian Society for Plastic Surgery regarding their attitudes and behaviours regarding the involvement of residents and fellows in trauma, elective and cosmetic surgery.

Results: One hundred and fifteen Plastic Surgeons across Canada responded to the online survey (34.5% response rate). The results of surgeons not involved in surgical training were excluded. In general, the results of the survey indicate that surgical educators are more committed to resident training than their patient's rights to be informed or direct their care. For example, only 1/2 of surgeons indicate that specifically requesting consent for trainee involvement is important and that most surgeons feel a standard consent form is all that is required for residents to assist or operate during surgery. More than 2/3 of surgeons reported willingness for the trainee to operate independently, with supervision, on trauma or elective patients, although this enthusiasm for resident autonomy drops to less than 1/3 for cosmetic surgery patients. Interestingly only 1/2 of surgeons report that patients can decline resident or fellow involvement in their trauma or elective surgery, but more than 3/4 of surgeons reported that cosmetic surgery patients can decline trainee involvement.

Conclusions: Canadian Plastic Surgeons indicate a clear commitment to intraoperative surgical training of residents and fellows, although this willingness declines precipitously when it involves cosmetic surgery patients. Unfortunately, the reported attitudes and behaviours of the surgeons are not consistent with the expectations of their patients, or the legal and ethical demands regarding informed consent.

P12 Aaron Knox, Plastic Surgery

Title: "Whether you think you can, or you think you can't – you're right." The detrimental effects of negative social-comparative feedback in

medical trainees learning suturing techniques

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Background: Social cognitive theory suggests that the feedback one receives about his/her performance is a powerful technique in developing self-efficacy. Social-comparative feedback has been shown to influence learner self-efficacy beliefs and motor skill acquisition. This feedback is provided to make the learner believe that he/she is performing better or worse than the group average, regardless of his/her actual performance. Our objective was to examine the role of social-comparative feedback in medical trainees learning basic suturing techniques.

Hypothesis: Providing positive or negative social-comparative feedback will have a beneficial or detrimental influence respectively on novice medical trainees ability to perform basic suturing tasks.

Methods: Novices (n=30) observed and practiced the simple interrupted suturing technique. Following this, trainees were divided into groups and shown fabricated performance summaries indicating that they were performing better or worse than their peers, regardless of their actual performance. Trainees were then asked to perform the horizontal mattress technique and following practice, again received positive or negative feedback consistent with their initial group assignment. A retention test was performed ~48hours later to infer learning of the horizontal mattress technique. Subjective variables of interest included self-reported situational motivation, self-esteem, and self-efficacy. Objective measures included total skill completion time and number of hand movements.

Results: There were no group differences at baseline for self-reported outcome measures and on the pre-feedback manipulation task (simple interrupted suture). Those receiving negative feedback reported lower self-efficacy during acquisition and retention testing (horizontal mattress) compared to those receiving positive feedback ($p=0.004$), and required significantly more time ($p=0.031$) and hand movements ($p=0.046$) to complete the task.

Conclusion: Our findings suggest that there is a significant relationship between negative social-comparative feedback and mindset that modifies performance, learning, and self-efficacy beliefs in medical trainees acquiring basic procedural skills.

P13 Karen Joughlin, General Surgery

Title: Unintended Injuries during Surgical Procedures – Analysis of Constraints for Future Solutions

Karen Joughlin, MD, PhD, FRCSC and Andrew Neal, PhD UBC, Department of Surgery and The University of Queensland, Key Centre for Human Factors & Applied Cognitive Psychology

Background: We try to avoid unintentional injury when we perform surgical procedures. When such injuries occur, though, our approach in identifying risk factors and labelling complications as "unavoidable" or "avoidable" (secret shame) seems inadequate in guiding us to solutions for future patients. Constraint analysis may acknowledge our challenges and provide the means to understand more deeply how and why unintended injuries occur, guiding us to new risk reduction strategies.

Objectives: This research was undertaken to systematically identify and understand the effects of key constraints which contribute to unintended injuries during surgical procedures performed in the operating room.

Methods: Consecutive unintended injuries requiring an intervention that occurred in the ORs of three urban teaching hospitals during a three month period were identified as soon after the event as possible by trained health record coders. The surgeon and assistant separately contributed data using Critical Decision Method interviews. Data were analyzed with a piloted constraints analysis tool, focusing on what limited the surgeon/assistant's ability to know/do what was needed to avoid the injury.

Results: Thirty-eight eligible cases from seven surgical disciplines were identified and data obtained from either surgeon or assistant in all cases (37/38 surgeons and 31/33 assistants). Hindrances in determining with sufficient accuracy the position or physical properties of instruments and patient structures and in precisely performing required physical actions predominantly contributed to injuries. In two cases, supervising surgeons had insufficient information to guide a trainee's decision-making and actions. These constraints were linked to qualities and variance of patient anatomy and pathology, human cognitive and motor limitations, equipment characteristics, surgical protocols, and the need to balance risk/harm with expected benefit.

Conclusions: This research indicates that unintended injuries are largely explained by a variety of elements that reduce the surgeon's ability to know the exact position or qualities of tools or patient structures and to execute the physical actions required. Understanding these constraints can now guide us to strategies for addressing factors that are practical to change, work around the negative effects of factors that cannot be changed and develop new ways to overcome constraints, to know or do what is needed for safe surgery.

P14 James Lawson, Otolaryngology

Title: Serum microRNA as a non-invasive biomarker for early diagnosis of lung adenocarcinoma

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Abstract: Lung cancer is the leading cause of cancer death worldwide. The survival rate for lung cancer patients is dismal, due largely to the typically late stage of disease diagnosis. While early lung cancers are more treatable and are associated with a better prognosis, they are less frequently diagnosed. To improve outcomes, new methods for early disease detection are needed. Recently, microRNAs (miRNAs), small non-coding RNAs, circulating in blood have been identified as biomarkers for many cancer types.

Objective: To examine serum microRNA expression profiles of patients with early stage lung adenocarcinoma to assess their utility as potential cancer biomarkers.

Materials and Methods: miRNA profiles were generated from peripheral venous blood draw from patients with early stage lung carcinoma and demographically matched (for: age, sex, ethnicity and smoking status) non cancer controls. RNA was extracted using a modified miRNeasy protocol. All samples were profiled using the miRCURY LNA™ Universal RT miRNA PCR system. After removal of miRNAs determined to be affected by hemolysis a Mann-Whitney U test was conducted on normalized values followed by a Benjamini-Hochberg correction. miRNA's with a p value < 0.05 after correction were selected for future validation studies.

Results: A total of 741 miRNAs were tested and 67 miRNAs were detected in all samples. On average 20 more miRNAs were detected in the matched control samples compared to the cancer samples. miRNA serum samples showed significant differences between the early stage lung carcinoma and their matched controls. These differences were seen not only in which miRNA's were expressed but also in the levels to which a given miRNA was expressed.

Conclusion: We have identified a list of potential serum miRNA biomarkers for the detection of early stage lung adenocarcinoma. This can allow for a non-invasive blood test for early detection of lung adenocarcinoma, and has the potential to be incorporated into the current multi-modal lung cancer risk prediction.

P015 Zaheer S. Kanji, General Surgery

Title: Loss of Heterozygosity As a Molecular 'Second Hit' In Familial Pancreatic Cancer: Integrative Genomics and Gene Discovery

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Background/Hypothesis: Familial Pancreatic Cancer (FPC) displays an autosomal dominant mode of inheritance with >80% of its genetic cause yet to be discovered. We hypothesize that a high density DNA microarray analysis of Formalin-Fixed Paraffin Embedded (FFPE) FPC tumors combined with germline exome sequencing initiatives will yield novel regions of genomic loss harboring disease causing FPC gene(s).

Methods: 158 FFPE FPC tumor specimens with matched normal tissue were reviewed by a pancreatic pathologist and tumors with >70% neoplastic cellularity were selected. Tumors with <70% neoplastic cellularity underwent laser capture microdissection. DNA was extracted from a total of 74 samples, whole genome amplified and processed on the Affymetrix 660K Oncoscan DNA Microarray. Copy number (CN) analysis was performed using Nexus Version 6.1 software employing the SNP-FASST2 segmentation and Allele Specific Copy Number Analysis of Tumors (ASCAT) algorithms. The Genomic Identification of Significant Targets in Cancer (GISTIC) algorithm was used to identify the most frequently lost loci, which were then cross-referenced with data from 33 germline FPC cases sequenced on the Illumina Genomic Analyzer Ix platform.

Results: A pair-wise analysis of 55 FPC samples with matched normal tissue was performed. Recurrent regions of loss of heterozygosity (LOH) were known loci of importance in pancreatic tumorigenesis, including CDKN2A, p53 and SMAD4. Copy neutral/gain LOH was observed throughout the genome and may account for >35% of chromosomal loss. Sub-group analysis of 2 FPC siblings demonstrated shared loss regions spanning 2 novel regions. Cross referencing of LOH regions including high frequency calls identified by GISTIC with germline deep sequencing exome data filtered for shared rare inactivating variants identified 8 novel putative tumor suppressor genes. Sanger sequencing of these genes confirmed the germline variants in 4/8 loci. Fluorescence in-situ hybridization has validated the loss regions in 3/4 loci with germline variants and the shared LOH regions in the 2 FPC siblings.

Conclusion: By combining next generation sequencing with microarray technology, we have identified potential novel genes involved in FPC. Future functional experiments will better characterize the pathophysiological role of these genes in the development of FPC.

P16 Allison Y. Ye, Radiation Oncology

Title: Patterns of Relapse in Squamous Cell Carcinoma of the Tonsil, Unilateral vs. Bilateral Radiation in the HPV-Era

Allison Y Ye², Katherine L Bradley³, Hosam Kader³, Y Kelly Liu⁴, Catherine Poh⁴, Tom Thompson⁵, Jonn Wu¹, John H Hay¹ ¹Radiation Therapy Program, Vancouver Cancer Centre, British Columbia Cancer Agency¹; Department of Oncology, Queen Alexandra Hospital, Portsmouth, United Kingdom²; Radiation Therapy Program, Victoria Island Cancer Centre, British Columbia Cancer Agency³; Integrative Oncology, British Columbia Cancer Research Centre⁴; Department of Pathology and Lab Medicine, Vancouver Cancer Centre, British Columbia Cancer Agency⁵

Background: Ipsilateral radiation (RT) for tonsil cancers reduces toxicity compared to bilateral techniques. In the pre-human papilloma virus (HPV) era, unilateral radiation (URT) was associated with low risk of failure in the contralateral neck.

Objectives: The purpose of this study was to explore the validity of URT in treating HPV-positive tonsil cancers.

Methods: Charts of tonsil squamous cell carcinoma (SCC) patients treated with radical RT or radical chemoradiotherapy (CRT) between 2001 and 2007 were reviewed. HPV status was determined through p16 immunohistochemistry staining. Data was collected on patient, tumour and treatment characteristics, as

well as treatment response and outcomes. RT was mainly either 70Gy in 35 daily fractions or 60Gy in 25 daily fractions. Chemotherapy was mainly q3 weekly high-dose Cisplatin or Carboplatin-based.

Results: Of 405 retrievals, 83 were excluded due either to classification errors, not receiving treatment at the agency or non-curative intent treatment; 140 were excluded because p16 status could not be determined. Of the 182 subjects reviewed, 142 (78%) were p16 positive. p16 positive subjects were younger (mean age 55.7 vs 59.5, $p=0.02$), mostly male (82% vs 58% male, $p<0.01$), mostly former or non-smokers (70% vs 24%, $p<0.01$), and had more advanced nodal stage (63% vs 44% N2-3, $p<0.01$). With a median follow-up of 68 months, overall rates of contralateral recurrence (CLR) were low (3.5% p16 positive vs 2.5% p16 negative, $p=0.63$). Amongst the p16 positive subjects, unilateral radiation was delivered to 37% and CLR rates were 7.5% for those treated with URT, and 1.1% for those treated with BRT, $p=0.05$. Of the 4 p16-positive subjects treated with URT who developed contralateral recurrences, three were treated with neck dissection (one cured, one died of lung metastases, and one was cured but then died of a separate malignancy); and one received palliative radiation to the neck and distant metastatic site. LC, LRC, DFS, DSS and OS rates were similar between those treated with URT vs BRT.

Conclusions: The association between HPV-positive tonsil SCC and improved survival outcomes, despite more advanced nodal stage is confirmed. While CLRs remain rare overall, there appears to be an increased rate among HPV-positive subjects treated with URT. However, overall outcomes do not appear to be impacted, suggesting that URT remains a reasonable approach in HPV-positive subjects.

P17 Sarah Nicole Hamilton, Radiation Oncology

Title: Does Asian Ethnicity Influence Outcomes in Nasopharyngeal Carcinoma?

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Purpose: The incidence of nasopharyngeal carcinoma (NPC) in Asian countries is up to 20 times higher than in North America. It is recognized that the etiology of NPC varies with ethnicity and may impact survival. Our study compares the outcomes of Asian and Non-Asian patients (pts) with NPC in British Columbia, a unique province with a 20% Asian population.

Materials/Methods: All pts with NPC treated at the British Columbia Cancer Agency (BCCA) from Jan 2000 to Dec 2009 were included. Patient and treatment data were retrospectively reviewed. Categorical variables were compared with the Chi-square test and continuous variables with the independent sample t-test. Outcomes were analyzed using the Kaplan-Meier method and log rank test. Multivariate analysis (MVA) was done using Cox regression.

Results: 380 pts were identified, 73% were Asian and 27% Non-Asian. Stages were grouped into early (I/II), advanced (III/IVA/IVB) and metastatic (IVC) and were 44%, 51% and 5% in Asian and 29%, 68% and 3% in Non-Asian pts respectively ($p=0.01$). Asian pts had lower ECOG status ($p=0.001$), less smokers ($p<0.001$) and were younger (mean age 51 vs 58 yrs, $p<0.001$). Median follow-up for living pts was 5.5 yrs.

Early stage 5-year overall survival (OS) for Asian vs non-Asian pts was 84% vs 69% ($p<0.001$) and disease specific survival (DSS) was 87% vs 72% ($p<0.001$). Progression free survival (PFS) was 71% vs 59% ($p=0.006$). Advanced stage OS for Asian vs non-Asian pts was 68% vs 37% ($p=0.001$) and DSS was 71% vs 39% ($p=0.01$). PFS was 60% vs 35% ($p=0.004$).

On MVA, lower stage, ECOG 0/1, Asian ethnicity and age <65 were significant factors ($p<0.05$) for improved OS, DSS and PFS. Sex, smoking status and concurrent chemoradiation were not significant predictors.

After locoregional recurrence (LRR), median survival was longer for Asian than Non-Asian pts (3.7 vs 0.9 yrs, $p<0.001$) with more Asian pts receiving curative intent salvage RT or surgery than Non-Asians (53% vs 23%, $p=0.01$). There was no difference in palliative chemo usage between the groups at LRR (63% vs 54%, $p=0.43$). For all pts, median survival after LRR was 6.0 yrs after salvage therapy vs 1.4 yrs without salvage ($p<0.001$). After distant relapse, there was no difference in median survival (0.9 vs 0.9 yrs, $p=0.18$) or palliative chemo usage (69% vs 54%, $p=0.17$) between Asian and Non-Asian pts.

Conclusions: Asian pts present with NPC at a younger age, lower stage and with better performance status than non-Asian pts. Asian ethnicity is an independent prognostic factor for improved OS, DSS and PFS. Asian pts had a longer median survival after LRR and were more likely to receive curative intent salvage therapy.

P18 Michael Peacock, Radiation Oncology

Title: BCCA Outcomes for Patients on Active Surveillance for Localized Prostate Cancer

Michael Peacock¹, Jon Aning², David Spicer¹, Brian Baker¹, Mira Keyes¹, Michael McKenzie¹ ¹BC Cancer Agency Department of Radiation Oncology ²University of British Columbia Department of Urology

Background: Active surveillance (AS) has evolved into a standard of care treatment option for patients diagnosed with low risk prostate cancer. AS aims to pick up prostate cancers with a propensity to curtail life expectancy while allowing those with indolent disease to delay or defer the side effects associated with radical treatment.

Objectives: The aim of this study was to evaluate the outcomes of patients with low and intermediate risk localized prostate cancers that were managed with AS at the BC Cancer Agency.

Methods: Patients included were diagnosed with low or intermediate risk prostate cancer who were also considered suitable for radical treatment with curative intent, managed with active surveillance at the BC Cancer Agency. Low risk was defined by PSA \leq 10, Gleason \leq 3+3=6, and T Stage \leq 2b and maximum of 2 cores positive on biopsy. Intermediate risk was defined as PSA 10-20, Gleason=7, or T Stage=2c. Between 1991 and 2012, a total of 173 patients under the age of 75 were treated with active surveillance according to institutional standards. Follow-up PSA, biopsy results and clinical examination were recorded at each visit and progression documented. Treatment details including utilization of prostatectomy, radiotherapy, brachytherapy and hormonal therapy were recorded. Date and cause of death was abstracted from the BC Cancer Registry.

Results: In total, 141 men enrolled had low risk prostate cancer and 32 had intermediate risk disease. During a median follow up of time of 68 months, 74 (42.8%) men had clinical progression with 83 (48.0%) deciding to undergo treatment with a median time to treatment of 31.8 months. Utilization by treatment type was radical prostatectomy n=16, brachytherapy n=30, external beam radiotherapy n=36, hormone monotherapy n=1. Overall, 17 patients died while on follow up with no deaths attributed to prostate cancer and no patients developed metastases related to prostate cancer.

Conclusions: The BCCA results for active surveillance in selected patients with low and intermediate risk patients are consistent with those previously published. A significant proportion of men will avoid treatment and associated negative side effects. AS should continue to be offered to men in our province with low and intermediate risk disease meeting criteria as an alternative to upfront curative treatment.

P19 A. Ross Hengel, Pediatric Neurosurgery

Title: Intraoperative ultrasound in pediatric brain tumors: does the surgeon get it right?

Ross Hengel¹ BSc, Ash Singhal¹ MD FRCS ¹British Columbia Children's Hospital, Division of Pediatric Neurosurgery

Background: Intraoperative ultrasound (IOUS) is a valuable tool – inexpensive, adds minimal surgical time, and involves minimal risk. The diagnostic predictive value of IOUS is not fully characterized in Pediatric Neurosurgery.

Objective: Our objective is to determine if surgeon-completed IOUS has good concordance with post-op MRI in estimating extent of surgical resection (EOR) of pediatric brain tumors.

Methods: We reviewed charts of pediatric brain tumor resections (single institution 2006-2013), including those with IOUS and immediate postoperative imaging (<1 week). The surgeon's estimation of the EOR based on IOUS and the post-operative neuroimaging results (gold standard) were collected, as well as information about the patients/tumors.

Results: 57 cases were reviewed. The concordance of interpretation, between IOUS and post-op MR was 89.3%. Of 41 cases where IOUS suggested gross total resection, 35 were confirmed on MR (negative predictive value, NPV: 85%). All 15 cases where IOUS suggested subtotal resection were confirmed on MR (positive predictive value, PPV: 100%). IOUS had a 94% concordance with postoperative imaging in 33 infratentorial tumors and there was 83% concordance in 24 patients with supratentorial tumors.

Conclusion: The results from this study suggest that IOUS is reliable with residual tumor (PPV – 100%) but less so when it suggests no residual (NPV – 85%). These predictive values of IOUS suggest there is room for improvement in intra-operative tumor detection, either by improving the diagnostic validity of ultrasound, or by the addition of other intraoperative adjuncts.

Lunch and Learn

Simultaneous Session A

A01 Nasim Abedi, Plastic Surgery

Title: How Many Work Hours are Requisite to Publish a Manuscript?

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University of British Columbia, Division of Plastic & Reconstructive Surgery

Background: Retrospective case series is the most prevalent study design in clinical research in surgical specialties. Quantifying the hours spent on a retrospective study from idea genesis to manuscript publication is therefore an important metric for clinicians, trainees, and administrators in academic medical centers. Such data will allow appropriate allocation of resources for research-based activities.

Objectives: This study therefore aimed to quantify work hours associated with publishing a manuscript with a retrospective study design.

Methods: 16 surgeons with 5 or more published retrospective studies identified via PubMed were surveyed on the number of hours spent by each member of the study team towards various components of the research cycle for each of their published studies.

Results: 13 of 16 surgeons returned 171 surveys, giving us 81% response rate. Analysis of responses revealed that it takes a median of 177 hours (range, 29–1287) to publish a retrospective study from its idea genesis. Medical students were found to contribute the most time per publication (34%) and data collection consumed the most hours (23%). No correlation was found between the number of authors or study subjects and the total hours required to publish a manuscript.

Conclusion: Currently, there is the absence of a good metric in the literature quantifying the hours that go into publishing a retrospective study. Results of this study suggest that clinicians spend on average 177 hours per publication, which translates to 22 working days. We hope that the results of this study pave the way for future investigations in this subject to inform the various stakeholders as to the time commitment necessary to ultimately publish surgical scientific research.

A02 GK Blair, Pediatric General Surgery

Title: Pediatric Surgical Camps as One Model of Global Surgical Partnership: A Way Forward

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Background/Purpose: There is an acknowledged disparity in the availability of pediatric surgical expertise in the world. We intend to show how a uniquely Ugandan method of holding surgical “camps” has been one means to help deal with the volume of patients needing surgery and provides opportunities for global partnership.

Methods: A partnership between pediatric surgeons in Uganda and Canada that began in 2002 has now evolved to Pediatric Surgical Camps (PSCs) organized by the Ugandans with team participation from Canadians. The PSCs goals were to provide pediatric surgical and anesthetic service, surgical, anesthesia and nursing education and to foster collaboration as a way forward to assist Ugandan health delivery.

Results: Three PSCs were held in Uganda in 2008, 2011 and 2013. A total of 677 children were served through a range of operations from hernia repair to more complex surgery such as imperforate anus and esophageal atresia repair. The educational mandate was achieved through the involvement of 10 Canadian trainees, 20 Ugandan trainees in surgery and anesthesia and numerous medical students. There were informal and formal tutorials, rounds and lectures held. The collaborative mandate was manifest in relationship building, a new understanding of the Ugandan health system and situation, 3 research projects completed and 1 drafted, agreement on future camps and a proposal for a Canadian-Ugandan pediatric surgery teaching alliance.

A03 James Boyle, Plastic Surgery

Title: Bed net related burns at Mulago National Referral Hospital, Uganda: A case series report

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Part 1 - Bed net related burns at Mulago National Referral Hospital, Uganda

Background: Insecticide treated bed nets are essential tools to prevent malaria in endemic regions, however, increasing trends in bed net related burns in Kampala, Uganda are concerning.

Methods: Data were collected from burns unit admission records at Mulago National Referral Hospital in Kampala, Uganda for the years 2008–2011 inclusive. Retrospective analyses on the characteristics of patients admitted with bed net related burns within this period were conducted.

Results: A total of 45 patients were admitted to the burns unit with bed net related burns. Most burns occurred among individuals who were 0-1 years old (33.3%) and 26-35 years old (24.2%) and the majority were male (71%). 15 of 45 patients died and 26 patients (57.8%) had Total Body Surface Area burn percentages that were greater than 20%.

Conclusion: Organizations responsible for malaria prevention should consider incorporating fire and burn prevention awareness, strategies and training into their bed net distribution programs.

Part 2 - Burning Bed Nets in Vancouver

Method: 4 nets were tested using a variant of the Canadian General Standards Board *Textile Test Methods- for Flame Resistance*

Results: All failed !

A04 Erick M. Carreras, Cardiovascular Surgery

Andrew I.M. Campbell

Title: Cardiac Strangulation Following Epicardial Pacemaker Implantation: A Rare Pediatric Complication

Introduction: Cardiac strangulation may occur following epicardial pacemaker implantation if the epicardial leads become adherent to the epicardium and wrap around the heart. With progressive somatic growth these leads may constrict the underlying cardiac structures causing mechanical complications and potentially death.

Objectives: The aim of our study was three-fold: To determine the incidence of this pathology, improve the implantation protocol of epicardial pacemakers and develop a protocol for follow-up that included regular reassessment and potential imaging.

Methods: All patients who underwent implantation of an epicardial pacemaker from January 1992 to March 2012 were included with hospital health records being used to gather retrospective data including basic demographics, surgical details and cardiac related check-up information for the first 2 check-up dates post-implant, and for every year thereafter. Any post-operative complication that occurred in between the yearly-recorded follow-ups were included. Prospectively, the patients that had not received a chest x-ray within the previous 2 years were approached for imaging with a standard two film chest x-ray to assess the leads' potential for causing cardiac strangulation - reviewed by a blinded radiologist. The primary outcome was mortality related to cardiac strangulation or reoperation for replacement of the epicardial pacemaker system due to mechanical dysfunction. Specific symptoms were also recorded as secondary outcomes, including: syncope, chest pain, arrhythmias and atrioventricular valve regurgitation. A multivariate analysis determined interdependency between the variables and primary and secondary outcomes.

Summary of Results: This study included 86 patients retrospectively, and 84 patients prospectively. There was a 2.3% incidence, and a 1.2% mortality related to cardiac strangulation. A characteristic pattern of posterior looping of the ventricular lead was seen in chest radiographs of both patients with cardiac strangulation and presenting acutely in both cases.

Conclusions: Our institutional incidence of cardiac strangulation is significantly greater than the previously reported approximation of 0.016%. Our data supports that the 2 cases of cardiac strangulation were not caused by a lack of follow-up but by a lack of effective and consistent imaging for diagnosis. This finding is supported by the 7 cases of cardiac strangulation found in the English literature (May 20

A05 Emily Chan, Plastic Surgery

Title: Minor Surgery Procedures: A Retrospective Chart Review

Emily Chan¹, Marija Bucevska¹, Cynthia Verchere²,

¹ Department of Surgery, University of British Columbia, ² Division of Plastic Surgery, British Columbia Children's Hospital

Introduction: Minor surgery under local anaesthesia has become an appealing option for parents and caregivers who want to minimize the risk of sedation in their children. This study evaluates the success of minor surgery procedures undertaken by a single plastic surgeon at BC Children's Hospital (BCCH).

Method: Eligible subjects for retrospective study were identified through the CERNER scheduling system for the period of May 1, 2011 to April 30, 2013. Parameters of interest included patient demographics, types of procedures, complications, and outcomes.

Results: 168 subjects (68 male, 100 female) undergoing a total of 219 procedures were included in this retrospective review. Ages ranged from 2 weeks to 18 years. Mean and median ages were 13.1 years and 13.7 years respectively. The most common diagnosis was nevus (63%) and the most frequently performed procedure was simple excision (75%). Median length of follow-up was 46 days and ranged between 4 and 606 days. A total of 45 complications were found in 36 patients. Complication rates were then divided into crusting (4.6%), delayed wound healing (3.2%), hypersensitivity reactions (2.3%), scar hypertrophy (1.8%), infection (0.9%), and other complications (7.8%). Procedures were also categorized under one of four possible surgical outcomes: patient and physician satisfied (93%), patient satisfied and physician unsatisfied (0.5%), patient unsatisfied and physician satisfied (2%), and both unsatisfied (4%). We excluded 20 procedures from outcome analysis because patient and/or physician satisfaction were unknown.

Conclusion: Minor surgery is an established practice in pediatric plastic surgery clinics with minimal complications and high patient satisfaction.

A06 Clarke Quinten, Plastic Surgery

Title: An Appraisal of the OPSEI Academic Rounds Evaluations

Quinten Clarke^{1,2}, Damian Duffy³, Douglas Courtemanche^{1,1} University of British Columbia Department of Surgery² Simon Fraser University Faculty of Health Sciences³ Office of Pediatric Surgical Evaluation and Innovation

Background: The Office of Pediatric Surgical Evaluation and Innovation (OPSEI) hosts monthly academic rounds for the surgical community at BC Children's Hospital. The purpose of this study is to evaluate the effectiveness of the current OPSEI Academic Rounds evaluation form and consider the possible design of a new form.

Methods: Data was obtained from OPSEI for completed evaluation forms from January 2010 – May 2013 and was collated. As two versions of the evaluation form were used during this period analysis was completed on a dichotomous basis where possible. (1) A distribution of scores from the two forms was constructed with the mode of each form being calculated. (2) Comments from new forms were analyzed qualitatively based upon four scoring categories (Good, Fair, Poor, and Incomplete). Comments were labeled as critical of content, project or presentation and presentation skills or, as positive, ambiguous, or absent. (3) Regression analysis was conducted for form completion as a function of rounds attendance.

Results: (1) The modes for the old and new form were 4/5 and 9/10 respectively. Scores were found on both forms to be spread primarily over four ratings, on the "old" form 2, 3, 4 and 5; and on the "new" form 7, 8, 9 and 10. (2) Comments were found to be largely positive regardless of score. Critical comments in any of the scoring categories were infrequent, ranging from 5.2% to 23.5% of comments. Comments were found to be more frequently included on forms where scoring sections were not completed. (3) Regression analysis found paradoxical trends between the two forms. "Old" forms were found to have a positive relationship between attendance and form completion ($R^2 = 0.582$) while "new" forms had a negative relationship ($R^2 = 0.157$).

Conclusions: The large scoring scales, used by attendees to evaluate presenters at OPSEI Academic Rounds, have become superfluous as few scores are consistently used by evaluators. Comments on OPSEI evaluation forms are frequently omitted or generally neutral, lacking in constructive criticism or meaningful feedback inhibiting the educational potential for presenters. Finally, the CanMEDS evaluation form, currently used, appears to be less accessible for the interdisciplinary round attendees.

A07 Johnathon Gorman, Plastic Surgery

Titles: Outcomes of Sclerotherapy for the Treatment of Venous Vascular Malformations

Johnathon Gorman¹, Marija Bucevska², Jugpal Arneja^{2,3}, Douglas Courtemanche^{2,3}

¹ University of British Columbia, ² Department of Surgery, University of British Columbia, ³ Division of Plastic Surgery, British Columbia Children's Hospital

Background: Venous vascular malformations (VVMs) are the second most common vascular anomaly, with a prevalence of approximately 1.5%. VVMs are congenital, slow-flow lesions which grow in proportion to the patient and do not spontaneously involute. The natural history of these lesions is degenerative. The most common anatomical location of these lesions is the head and neck and common presentations include pain, swelling, discolouration and disfigurement. The preferred treatment of VVMs is sclerotherapy, commonly utilizing detergents or ethanol. This study reviews the outcomes and complications of sclerotherapy for the treatment of VVMs in patients managed by the Vascular Anomalies Clinic at BC Children's Hospital.

Materials and Methods: A 10 year retrospective chart review with minimum 2 year follow-up was conducted for patients with VVMs who presented to the Vascular Anomalies Clinic at British Columbia's Children's Hospital since May 1, 2001. Data collected included demographic data, VVM characteristics, sclerotherapy treatment details, outcomes, recurrence rates, and follow-up course.

Results: A total of 63 patients (44 females and 19 males) were identified for the study, with 65 VVMs treated. The most common indications for treatment included swelling (83%), pain (62%), discolouration (60%), and recurrent thrombophlebitis (40%). There were a total of 145 sclerotherapy procedures conducted during the study period. There were complications associated with 21% of the procedures (31 in total) and the most common complication was significant post-procedural swelling. Of the 65 VVMs treated, 49 had a positive outcome compared to baseline, 4 were unchanged, 4 had a negative outcome, and 8 were still undergoing treatment at the end of the study period.

Conclusions: Sclerotherapy is a relatively safe and effective treatment for VVMs. The complication rate of sclerotherapy procedures was 21%, with the majority of complications being minor and transient.

A08 Joshua Gurberg, Otolaryngology

Title: Laryngeal Penetration on Modified Barium Swallow is Associated with Increased Pneumonia in Children

Joshua Gurberg, B.Sc., M.D.C.M., PGY-1, Otolaryngology-Head & Neck Surgery, University of British Columbia
Rena Birnbaum, M.Sc. (OT), Montreal Children's Hospital; Sam J. Daniel, M.Sc., M.D.C.M., Director, Division of Pediatric Otolaryngology, Montreal Children's Hospital

Objective: To determine whether children with laryngeal penetration (barium meal passing into the supraglottis, but above the vocal folds) on modified barium swallow are at higher risk for pneumonia and aspiration than patients with normal findings.

Methods: We reviewed the charts of 235 pediatric patients presenting to our Swallowing and Dysphagia Clinic for modified barium swallow from 2008 to September 2011. All patients had at least one year of clinical follow up. Patients with unsuccessful swallowing studies, incomplete charts, other etiologies for recurrent pneumonia, or who were lost to follow up were excluded. Out of the 165 patients remaining, 58 had normal findings, 59 had laryngeal penetration, and 48 had frank aspiration. Pneumonias, aspiration events, and demographic data were recorded for all patients.

Results: Analysis showed that children with laryngeal penetration had significantly ($P=0.032$) more pneumonias than patients with normal swallowing studies (median 2 vs 0; mean 2.22 vs. 1.60). Furthermore, our data revealed that glottic abnormalities (e.g. laryngeal cleft) represented a significant independent risk factor ($p=0.004$) for pneumonia and aspiration, while being diagnosed with a syndrome did not ($p=0.343$).

Conclusions: To our knowledge, this study is the first to demonstrate that laryngeal penetration on modified barium swallow is associated with significantly more pneumonia and aspiration in children. This information may be useful in deciding whether to feed a child after modified barium swallow, especially in children with glottic abnormalities.

A09 Al-Rahim R. Habib, Otolaryngology

Title: The Effect of Head Position on the Distribution of Topical Nasal Medication Using the Mucosal Atomization Device: A Cadaver Study

Al-Rahim R. Habib, Andrew Thamboo, Jamil Manji, Rachelle C. Dar Santos, Eng Cern Gan, Amy Anstead, Amin R. Javer
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Background: The Mucosal Atomization Device (MAD) distributes medication throughout the paranasal sinuses for patients with chronic rhinosinusitis (CRS). Determining the optimal head position is important to ensure maximal delivery of medication to the sinus cavities.

Objective: To determine the effect of the Lying-Head-Back (LHB) and Head-Down and Forward (HDF) position, on the distribution of topical nasal medication via MAD in cadaver specimens.

Methods: Twenty specimens having received complete functional endoscopic sinus dissection were chosen. The MAD was used to administer 2ml of fluorescein impregnated saline solution through the nose in both the LHB and HDF positions. Fluorescein was identified on eleven pre-determined anatomical areas using a blue light filter. Three blinded investigators assessed endoscopic images to determine the presence of fluorescein.

Results: A total of 440 anatomical locations ($n=20$ cadavers) received administration of the fluorescein nasal spray in the LHB or HDF position. LHB position had significantly greater total distribution to all pertinent anatomical sites than the HDF position (76% vs. 41%; $p<0.001$; 95%CI: 0.26 – 0.44). The proportion of staining was significantly greater for the ethmoid ($p=0.11$; 95%CI: 0.05-0.66), frontal ($p<0.01$; 95%CI: 0.20-0.80), and sphenoid sinuses ($p=0.03$; 95%CI: 0.07-0.73) when compared to the HDF position.

Conclusion: A greater distribution of medication to the sinonasal cavities was observed in the LHB position compared to the HDF position. These areas are of particular clinical relevance in post-op patients with refractory CRS.

A10 Mike Kerr, Pediatric Neurosurgery

Title: Review of complications following non-urgent craniotomy: does my patient need to go to the PICU?

Mike Kerr^{1,2}, Ash Singhal¹, Doug Cochrane¹, Paul Steinbok¹ ¹UBC Department of Surgery, Division of Pediatric Neurosurgery, ²UBC Medicine

Background: Patients are routinely admitted to ICU after elective craniotomy. Although the factors predicting post-operative complications have been explored in adults, these factors are not fully characterized in children.

Objective: The purpose of this study was to explore the frequency and predictors of serious early post-operative complications requiring intensive care management.

Methods: We conducted a retrospective review of patients < 18 years old with non-urgent cranial surgery at British Columbia's Children's Hospital from 2008-2012. Emergency procedures and patients requiring pre-operative PICU care were excluded from this review. Study variables included patient demographics, clinical history, operative details, and early post-operative complications requiring intensive care management.

Results: 76 patients were included in our review, of which 70 had an uneventful postoperative recovery, one had an early CSF leak (the diagnosis or management of which was not specifically enhanced by the ICU stay), and one required vasoactive drugs for hypertension. Amongst the 4 patients (5.3%) with serious early complications, 3 required urgent medical imaging for unexpected neurological deficits (1 post-operative hematoma, 1 persistent hydrocephalus, 1 unremarkable imaging exam in a slow to wake patient), and one patient required intubation/ventilation for an unexpected awakening delay. These 4 patients all had anesthetic times exceeding 450 minutes, and 3 had undergone posterior fossa tumor surgery.

Conclusion: This study suggests that children most at risk for early serious post-operative complications, including neurological and cardio-respiratory complications, are those with lengthy procedures, often involving the posterior fossa or brainstem. Patients with shorter procedures and those with supratentorial pathology might not require post-operative ICU monitoring.

A11 Divjot Kumar, Otolaryngology

Title: Chloral Hydrate Sedation for Auditory Brainstem Response Testing in Children: Safety and Efficacy

Divjot Kumar¹, Dianne Valenzuela¹, Cheryl Labelle², Frederick K. Kozak^{1,2}, Neil K. Chadha^{1,2}
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Background: The Auditory Brainstem Response (ABR) test is used to identify hearing loss and measure hearing thresholds of infants and children who cannot be tested using standard hearing methods. In order for the ABR to yield usable results, the child must be kept asleep throughout the duration of the test. In many centres, this is achieved through a general anesthetic, with its inherent risks and costs. Since 2004, ABRs have been routinely conducted at BC Children's Hospital in an ambulatory care setting, using chloral hydrate and monitoring by a sedation nurse.

Objectives: The aim of this quality assurance study was to assess the effectiveness and safety of nurse-led sedation with chloral hydrate for ABR testing at BC Children's Hospital.

Methodology: Medical and audiology records for children aged 3 months to 17 years, who underwent ABR testing from 2004 to 2012, were reviewed. We assessed the dosage of drug used, condition of child after CH administration, adverse effects, audiological results, patient's vital signs and oxygen saturation, and the effectiveness of the sedative in keeping the child asleep through the duration of the test. Frequency distributions were derived for adverse outcomes and audiological results.

Results: 732 ABR records encompassing 641 children (multiple ABR tests for some children) were reviewed, out of which, Chloral hydrate sedation was used for 708 ABRs. The average dose of Chloral Hydrate used was 50mg/kg. The majority of sedated ABR's (79.2%) were completed without incident. Significant events [Apnea and Bradycardia], minor complications [Vomiting, Hypoxemia, Prolonged Sedation, and Tachypnea] and Restlessness were noted in 4.1%, 8.0%, and 5.1% of the cases, respectively. Most of these complications resolved without medical intervention. Additionally, in 3.6% of ABRs, Chloral hydrate administration failed to sedate the child adequately for the ABR.

Conclusions: Based on our frequency distributions, we believe that the use of chloral hydrate in the presence of a sedation nurse is a safe and reliable method of performing ABR in infants and children. This may be of significant value to centres worldwide considering general anesthesia alternatives for ABR testing.

A12 Lauren Ogilvie, Otolaryngology

Tracheostomy at BC Children's Hospital: a Quality of Care 30 Year Review

Lauren N. Ogilvie¹, Simon Chiu¹, Jessica Kozak¹, Robert J. Adderley², Frederick K. Kozak¹
BCCH Division of Pediatric Otolaryngology¹, BCCH Home Tracheostomy and Ventilation Program²

Background: Pediatric tracheostomy has undergone notable changes in frequency and indication over the past 30 years. Frequency of the procedure has recently leveled off after a decline occurred in the 1980's and 1990's. The primary indication for tracheostomy has shifted from infection causing upper airway obstruction to prolonged ventilation. Complication rates have remained generally consistent with a large reported range that can be partly attributed to ambiguity in the definition of a complication. As BC Children's Hospital (BCCH) is a main provincial centre for pediatric tracheostomy, reviewing the quality and care of this procedure has been undertaken.

Objectives: To investigate whether the demographics, incidence, indications, length in situ and complications for pediatric tracheostomy have changed over a 30 year period at BCCH.

Methods: A retrospective chart review of tracheostomy cases at BCCH from 1982 to 2011 was conducted. Charts were reviewed for demographics, date of tracheostomy, surgeon, indication, complications, mortality and date of decannulation.

Results: 240 charts were reviewed with a mean age at tracheostomy of 3.65 years. Indications consisted of upper airway obstruction (33%), syndromes (10%), prolonged intubation (15%), neurological (7%), trauma (11%), cancer (6%), laryngeal abnormalities (13%), and infection (4%). Complication rate across the entire cohort was 20%. Decannulation occurred in 61% of patients after an average of 470 days of tracheostomy in situ. Tracheostomy related mortality occurred in 2.1% of patients.

Conclusions: The majority of tracheostomies occurred in patients less than 2 years of age with a main indication of upper airway obstruction across all ages. Complication rate at BCCH is within the range previously reported by comparable medical centres. The procedure is associated with a low rate of tracheostomy related mortality. Pediatric tracheostomy is considered a safe and effective procedure at BCCH.

A13 Andrew Thamboo, Otolaryngology

Title: Can the SNOT-22 and UPSIT Appropriately Select Pediatric Cystic Fibrosis Patients that Should Be Referred to an Otolaryngologist?: Cross-Sectional Study

Andrew Thamboo, Rachelle C. Dar Santos, Lalendra Naidoo, Ronak Rahmanian, Mark A. Chilvers, Neil K. Chadha
Otolaryngology, University of British Columbia

Background: Sinus disease is present to some degree in nearly all children suffering with cystic fibrosis (CF). As survival rates have improved, it has become imperative that Otolaryngologist become involved in the care of CF patients to provide appropriate medical and surgical interventions for sinus disease. Despite poor subjective reporting of clinical symptoms, some studies have demonstrated relationships between clinical information and severity of sinus disease.

Objective: To determine whether the addition of the Sino-Nasal Outcome Test (SNOT-22) and the University of Pennsylvania Smell Identification Test (UPSIT) as well as other known documented predictors of sinus disease in CF patients could be used in predicting the presence of sino-nasal disease.

Methods: A cross-sectional study was conducted at the Cystic Fibrosis Clinic at BC Children's Hospital in Vancouver, Canada. All CF children completed the SNOT-22 and the UPSIT surveys. Nasal endoscopy was performed to determine the presence of nasal polyps. The predictive value for the presence of nasal polyps was calculated using clinically relevant information obtained during the CF patient's clinic visit which included age, sex, genotype, pancreatic function, SNOT-22, UPSIT, oral swab and severity of FEV₁. In a step-wise fashion, potential predictors were placed in the model and the positive and negative predictive value as well as the positive likelihood ratio of the final model was provided.

Results: There were 72 eligible children with CF for this study. Thirty-seven of these patients (23 males, 14 females) participated in this study. A SNOT-22 score of greater than 11 proved to be the only predictor of nasal polyps (p=0.04). The positive predictive value was 68.1%, the negative predictive value was 66.7% and the positive likelihood ratio was 1.82.

Conclusion: Given the SNOT-22 is easy to administer and cheap, a sinus specific disease questionnaire is appropriate to provide to CF patients in the clinic to help predict sino-nasal disease.

A14 Cynthia Verchere, Plastic Surgery

Title: An Early Shoulder Repositioning Program in Birth Related Brachial Plexus Injury

Cynthia Verchere^{1,2}, Marija Bucevska¹, Georgina Martin³, Claudia Malic³, Doria Bellows⁴, Kim Durlacher⁵
¹ Department of Surgery, University of British Columbia, ² Division of Plastic Surgery, British Columbia Children's Hospital, ³ University of British Columbia, ⁴ Physiotherapy Department, British Columbia Children's Hospital, ⁵ Department of Occupational Therapy, British Columbia Children's Hospital

Background: Birth related brachial plexus injury (BRBPI) occurs in 1.2 /1000 births in BC. Even in children with "good" recovery, external rotation (ER) and supination (Sup) are often weaker, and permanent skeletal imbalance ensues. A preventive early infant shoulder passive repositioning program was created using a novel custom splint holding the affected arm in full ER and Sup: the Sup-ER splint. A 4-year evolution of pilot protocol now has international interest.

Materials and Methods: A retrospective review of BCCH patients managed with the Sup-ER protocol from 2008 to 2011 compared their recovery scores to matched historical controls selected from our database by two independent reviewers.

Results: The protocol was initiated in 18 children during the study period. 6 were excluded due to: insufficient data to be analyzed, non-compliance, late splint initiation, and loss to follow-up. The remaining 12 matches showed that the Sup-ER group final score at two years was better by a clinically significant 1.2 AMS points (p=0.036) in Sup compared to the control group and a similar clinical difference was noticed in ER

($p=0.13$). Unexpectedly, but importantly, during the study period, zero percent of patients were assessed to have the active functional criteria to indicate brachial plexus reconstruction, where previously we operated on 14%.

Discussion: Early application of passive shoulder repositioning into Sup and ER provides better outcomes in function of the arm in infants with BRBPI. A North American multi-site randomized control trial has been approved and is on track to start recruitment this summer.

Simultaneous Session B

B01 Julianna Caon, Radiation Oncology

Topic: Radiation Induced Nausea and Vomiting: Are Guidelines Followed, and Why?

Julianna Caon, Christine Rodgeron, Michael McKenzie BC Cancer Agency Radiation Therapy, Vancouver Site

Background: Despite the publication of such radiation-induced nausea and vomiting (RINV) practice guidelines, literature suggests that radiation oncologists may be unaware of their existence and may underestimate the clinical prevalence and impact such symptoms have on their patients.

Objectives: To observe current practice at the BC Cancer Agency (BCCA) Vancouver Centre and use this as a guide to structure a focus group reviewing clinical practice and perception of radiation-induced nausea and vomiting.

Methods and Materials:

Part One: Between March 1st and April 30th, 2013, patients who received radiation therapy to any volume between T11 and L3, inclusive, were deemed to be at “moderate risk” of RINV. These patients were prospectively observed for the presence of nausea and vomiting, and the use of prophylactic and rescue anti-emetics.

Part Two: In May 2013, radiation oncologists, nurses, and residents participated in focus groups to assess knowledge, understanding, and individual uptake of clinical practice guidelines, as well as explore reasons about barriers to such.

Results

Part One: 49 patients were eligible. Mean age 65yrs (range 34 – 88. 92% of patients received prophylactic anti-emetic treatment prior to the first fraction of radiation therapy; Ondansetron alone was the most common (83%) anti-emetic prescribed.

Part Two: It was recognized that delayed RINV may be under-recognized as cases were not often seen in follow up or questioned directly about these symptoms if they were. All groups identified that collaboration amongst each other was useful to ensure prophylaxis was used consistently. Obstacles identified to effective anti-emetic prophylaxis were felt to be patient-medicine education, language barriers, and drug cost prohibitions.

Conclusion: At the BCCA Vancouver Centre, prophylactic anti-emetic treatment is commonly used in the setting of moderate risk RINV. Despite this, strategies to ensure routine prophylaxis and ongoing staff education were encouraged. This evaluation of practice and health care professional engagement in the issue of RINV may be used to inform and craft further practice interventions to better patient care and symptom control.

B02 Kristin DeGirolamo, General Surgery

Title: Comparison of orthotopic liver transplantation techniques regarding perioperative transfusion requirements

Dr. Tiffany Chan, Dr. Maja Segedi, Dr. Andrzej Buczkowski Supervisor: Dr. Andrzej Buczkowski UBC Department of Surgery

Background: Three main surgical techniques (classic IVC interposition, hepatic vein piggyback, and side to side IVC) are utilized in orthotopic liver transplantation. The superiority of one technique over the others has not been demonstrated.

Hypothesis: The side-to-side IVC piggyback technique may be hemodynamically advantageous as side clamping of the IVC maintains venous return and may reduce the degree of hemodynamic shift and blood loss during the process of vascular anastomosis and hepatic reperfusion.

Methods: A total of 203 adult liver transplants were performed at Vancouver General Hospital between 2007-2011. A random sample of 81 procedures (Classic=21, HVPB=28, SSIVC=31) was analyzed for transfusion requirements intraoperatively and during the first 24 hours of ICU stay.

Results: There was no difference in the baseline characteristics of the three groups in terms of age, MELD, or Child-Pugh score. There was no significant difference in the quantity of FFP, platelets, crystalloids, or colloids transfused. However, transfusion of pRBC intraoperatively was found to differ significantly between the hepatic vein piggyback and side-to-side IVC techniques (Mean=4.0 vs. 7.47 units, $P=0.025$). Rate of reoperation for bleeding was 13.4% overall (Classic=3, HVPB=2, SSIVC=4).

Conclusion: Use of the side-to-side technique may result in greater transfusion of pRBC intraoperatively.

B03 Zahid Delwar, Radiation Oncology

Title: Potency of oncolytic herpes virotherapy is hindered by microglia barrier in glioma

Zahid M. Delwar^{1,2,3}, Yan Hua Wen^{1,4}, Jennifer W.J. Wong^{1,2}, Luke Bu^{1,2}, Guo Yu Liu^{1,2}, William W. Jia^{1,2}

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Background: Oncolytic herpes simplex virus type 1 (oHSV-1) therapy is an emerging treatment modality that selectively destroys cancers including conventional therapy resistant tumors like glioblastoma multiforme (GBM). G207, one of the most clinically tested oHSV-1 with mutated ICP6 and γ 34.5 genes. G207 have shown promising antitumor efficacy in preclinical GBM models but clinical trials fail to confirm its efficacy against GBM. Abundance of microglia /macrophages has been extensively documented in clinical GBMs, which contribute at least one third of a GBM tumor mass. However, the response of microglia after oHSV-1 treatment is still unclear.

Objectives: The aim of the present study was to understand how microglia affect the oncolytic potency of oHSV-1 in glioma.

Methods: We used human GBM (U87) cells and rat primary microglia cells to study the effect of microglia on G207 and other oHSV-1 treatment in GBM in-vitro.

Results: In this report, we provide evidence that microglia suppress G207 growth in U87 cells in a dose dependent manner. In addition, microglia showed a similar suppressive effect against other oHSV-1s as well as wild type HSV-1. This suppression is not due to microglia secreted nitric oxide (NO) or other secretory products but rather by phagocytotic uptake of oHSV-1. Despite the expression of virus carried reporter gene, oHSV-1 do not replicate in the microglia but vigorously stimulate microglia proliferation, which may generate a barrier for dissemination of oHSV-1 in glioma mass.

Conclusions: Our current study unveils the response and mechanism of microglia following oHSV-1 treatment. These findings likely have important implications to improve the therapeutic efficacy of oncolytic virotherapy.

B04 Krista Genoway, Plastic Surgery

Title: Effects of Chemotherapy and Radiotherapy on Outcomes in Immediate Versus Delayed Autologous Breast Reconstruction

Krista Genoway¹, Leslie Leung¹, Aaron Knox¹, Scott Tyldesley² & Sheina Macadam¹ University of British Columbia Department of Surgery, Division of Plastic Surgery
University of British Columbia Department of Surgery, Division of Radiation Oncology

Background: Uncertainty exists as to the timing for breast reconstruction in patients requiring radiation and chemotherapy. Few studies have addressed the reconstructive timing of autologous breast reconstruction in this patient sub-group.

Objectives: To identify the effects of radiation and chemotherapy on autologous breast reconstruction in this challenging oncologic population. Compare the timing sequence of chemotherapy and radiation delivery with immediate and delayed autologous breast reconstruction in patients requiring both radiation and chemotherapy in addition to a mastectomy.

Method: This study is a retrospective review of autologous (DIEP or p-TRAM flap) breast reconstruction patients that required both radiation and chemotherapy in addition to a mastectomy between September 2000 and August 2012. Outcomes include complication rates, aesthetic outcomes and locoregional recurrence rates.

Results: One hundred and sixty one women were included in this study. Complication rates between the patients in the immediate and delayed groups were similar including; infection rate ($p=0.31$), mastectomy flap necrosis ($p=0.56$), hematoma ($p=0.065$), flap loss ($p=0.46$), seroma ($p=0.42$) and fat necrosis ($p=0.49$). An increased survival was identified in the delayed reconstruction group (95% vs. 92% at 10 years).

Conclusions: Our study identified high complication rates in both the immediate and delayed breast reconstruction groups. Patients that underwent immediate breast reconstruction following neoadjuvant radiation and chemotherapy demonstrated similar rates of post-operative complication as patients with delayed reconstruction after adjuvant radiation and chemotherapy.

Teaching Objectives: (1) Identify the effects of radiation and chemotherapy on autologous breast reconstruction (2) Review the timing sequence of chemotherapy and radiation in the setting of mastectomy and autologous breast reconstruction

B05 Andrea Lo, Radiation Oncology

Title: The PSA at 4-5 years after Low-Dose-Rate Prostate Brachytherapy is a Strong Predictor of Disease-Free Survival

Andrea Lo, James Morris, Vincent Lapointe, Jeremy Hamm, Mira Keyes, Tom Pickles, Michael McKenzie, Ingrid Spadinger Radiation Therapy Program, British Columbia (BC) Cancer Agency, Vancouver Centre and University of British Columbia.

Background: Assessing outcome after low-dose-rate prostate brachytherapy (LDR-PB) is a challenge, requiring extended duration of follow-up.

Purpose: To determine the: (1) prognostic utility of prostate-specific antigen (PSA) at 45 to 60 months (48mPSA) after low-dose rate prostate brachytherapy (LDR-PB), (2) predictors of 48mPSA, and (3) prognostic utility of directional trends between PSA at 24, 36, and 48 months after LDR-PB

Materials and Methods: Between 1998 and 2008, 2223 patients with low- and intermediate-risk prostate cancer received LDR-PB monotherapy. A cohort of 1434 of these patients had a documented 48mPSA, with no evidence of disease relapse prior to the 48mPSA. In addition, a subset of 585 patients was identified with ≥ 72 months follow-up, with documented PSA values at both 24 and 36 months after implant.

Results: Median follow-up time was 76 months. Eight-year Kaplan-Meier (KM) disease-free survival (DFS) were 100% vs. 73.4% for patients with 48mPSA ≤ 0.2 vs. >0.2 ng/mL; 99.1% vs. 53.8% for a 48mPSA threshold of ≤ 0.4 vs. >0.4 ng/mL; and 97.3% vs. 0% for a threshold of ≤ 1.0 vs. >1.0 ng/mL. On Cox regression analysis, a lower 48mPSA was associated with improved DFS ($p<0.0001$). On subset analysis (N=585), 29 had a PSA rise (defined as >0.2 ng/mL) between 24 and 36 months, 19 had a rise between 36 and 48 months, and 11 had rises at both intervals. Failure rates in these patients were 52%, 79% and 100%, respectively. On multivariate analysis, initial PSA, androgen deprivation therapy, and dose to 90% of the prostate (D90), significantly correlated with 48mPSA, but together accounted for $<6\%$ of its total variance.

Conclusions: The 48mPSA after LDR-PB is highly predictive of long-term DFS. Patients with 48mPSA ≤ 0.4 ng/mL have a $<1\%$ risk of disease relapse at 8 years, while all patients with a 48mPSA of >1.0 ng/mL relapsed. Consecutive PSA rises of >0.2 ng/mL from 24 to 36 months, and from 36 to 48 months, were also highly predictive of subsequent failure.

B06 Sarah Lucas, Radiation Oncology

Title: Spinal Instability Neoplastic (SIN) Scores and spinal surgery referral patterns in unselected patients receiving palliative radiotherapy for metastatic disease to the spine

Sarah Lucas, Sheri Lomas, Christina Cumayas, Lorna Weir and Scott Tyldesley

Background: The International Spine Oncology Study Group has defined spinal instability as the "loss of spinal integrity as a result of a neoplastic process that is associated with movement-related pain, symptomatic or progressive deformity and/or neural compromise under physiological loads". The recently validated Spinal Instability Neoplastic (SIN) score rates 6 elements (location, character of pain, alignment, bone lesion quality, percent vertebra involvement and posterior element involvement) on a scale of 0 to 18. It was developed to assist oncologists in deciding when to refer to a spinal surgeon (recommended for scores of 7 or higher on an 18 point scale). This study set out to describe the range of SIN scores seen in consecutive patients receiving palliative radiotherapy (RT) to the spine and to determine if current recommendations for referral based on SIN score fit with existing referral patterns.

Methods: All patients receiving palliative RT to the spine at a single institution from February 2012 – February 2013 were included. Pediatric patients, patients with previous spinal instrumentation within the treated fields, patients with evidence of spinal cord compression, and patients previously treated with radiotherapy to the same site were excluded. SIN scores were retrospectively assigned at the time of radiotherapy based on CT images from the RT planning system, diagnostic imaging performed around the time of RT, and the patient's electronic medical record. Patient, tumor, and treatment-related factors were extracted from patient charts. Whether or not a patient was referred to a spinal surgeon within 6 months prior to or following RT was recorded.

Results: A total of 118 subjects were reviewed. 18 were excluded based on the aforementioned criteria. Primary neoplasms consisted of: breast (28), lung (22), genitourinary (15), gastrointestinal (14), gynecologic (5), lymphoma (4), myeloma (4), melanoma (3), sarcoma (2), nasopharynx (2), and skin (1). The majority of subjects (69%) had SIN scores denoting potential spinal instability warranting a surgical consultation. Ten subjects (10%) had SIN scores that fell within the category of spinal instability (i.e. a score of ≥ 13). Nine patients were referred to a spine surgeon within 6 months of RT. There were no statistically significant differences between the referred and the non-referred subjects with respect to age, performance status, Charlson co-morbidity score, control of primary disease, or the number of vertebral levels involved.

Conclusions: The majority of patients receiving palliative RT to the spine have potential spinal instability (scores ≥ 7). Current referral rates are low relative to published recommendations based on SIN score.

B07 Benjamin Maas, Radiation Oncology

Title: Prostate Brachytherapy: Do Thinner Needles Improve Outcomes and Dosimetry?

Benjamin Maas¹, Mira Keyes¹, Tom Pickles¹, Ingrid Spadinger¹, Vince Lapointe¹ and James Morris^{1,2}, Radiation Oncology, British Columbia Cancer Agency, Vancouver, BC, Canada.

Background: Thinner 20G needles are being used in place of 18G needles for implantation of 125I prostate brachytherapy seeds at the British Columbia Cancer Agency (BCCA) for treatment of prostate cancer.

Objectives: The purpose of this study is to review differences in toxicity and dosimetry among patients treated with 20G and 18G strands. Thinner needles are hypothesized to cause less implantation trauma, and therefore fewer associated genito-urinary (GU) and gastro-intestinal (GI) side effects.

Methods: This is a retrospective analysis of patients treated with prostate brachytherapy with Oncura Inc. 20G ThinSeed™ (9011) and 18G OncoSeed™ (6711) strands. All patients were treated by 3 experienced radiation oncologists. Equal number of consecutive patients treated with ThinSeed™ (9011) and OncoSeed™ (6711) (treated just prior to switching) were selected. Patient-administered international prostate symptom scores (IPSS), sexual health inventory for men scores (SHIM) were collected at baseline, 6 weeks, and 6 months post-implantation. Acute toxicity was also graded by physicians according to the Radiation Therapy Oncology Group (RTOG) scale for GU and GI toxicity. Brachytherapy dosimetry was calculated on post-implantation day

0- CT scan, and compared between treatment groups.

Results: 336 patients treated between 2008 and 2012 were included in this analysis, 50% (168) were treated with ThinSeed™ (9011) and 50 % with OncoSeed™ (6711). 6-week follow-up data was available for 215 patients, and 6-month follow-up for 166. Post-implant dosimetry and baseline characteristics were available for all 336. There was no difference in baseline IPSS and SHIM score between the two groups. At 6-weeks and 6-months post implant no statistically significant difference between groups was found with respect to IPSS, SHIM, catheterization rate, or acute GU RTOG toxicity. There was a significant difference in acute GI RTOG favoring the OncoSeed™ (6711). At 6 weeks ThinSeed™ (9011) patients had 32.4% Gr 1 and 8.8% Gr 2 toxicity, while OncoSeed™ (6711), only 3.8% had gr. 1 and 3.8% gr. 2 toxicity ($p < 0.0001$ with Wilcoxon rank sum test). At 6-month follow-up, GI RTOG again approached significance with 27.1% (19/70) ThinSeed™ (9011) patients experiencing grade 1 or higher toxicity and 16.7% (16/96) OncoSeed™ (6711) patients experiencing grade 1 or higher toxicity ($p = 0.078$). Kaplan-Meier analysis of time to IPSS resolution to pre-implant levels for the two groups did not differ ($p = 0.47$ log-rank test). On post implant dosimetry, ThinSeed™ (9011) patients had higher mean prostate V100 (95% vs 92%, $p < .001$) and mean prostate D90 (113Gy vs 107Gy, $p < .001$). Mean rectal V100 was also higher in the ThinSeed™ (9011) patients (0.4cc vs. 0.3cc $p = 0.004$). There was no statistically significant difference with respect to urethral dosimetry. Mean prostate volume post implant was smaller among patients treated with ThinSeed™ (9011) (44cc vs 49cc, $p < .001$).

Conclusions: This retrospective analysis of patients treated with ThinSeed™ (9011) and OncoSeed™ (6711) did not support the hypothesis that thinner needles reduce toxicity. Urinary and sexual symptoms were equivalent between the treatment groups, while rectal dose and toxicity was higher among those treated with the ThinSeed™ (9011). It is possible that thinner needles reduce trauma and edema in implanted tissue, as supported by the observed smaller post-implant mean prostate volumes of our thin strand patients. Reduced edema, however, may cause closer proximity of implanted sources to the rectum, and subsequently increase rectal dose and GI toxicity.

B08 Brett Mador, General Surgery

Title: Early Versus Delayed Cholecystectomy Following Endoscopic Sphincterotomy for Mild Biliary Pancreatitis

Brett Mador, BSc, MD, O. Neely M. Pantan, MB, BS, FRCSC, FACSS, . Morad Hameed, MD, MPH, FRCSC, FACS, Vancouver General Hospital, Division of General Surgery

Background: The recommended treatment for patients presenting with mild biliary pancreatitis is early cholecystectomy performed during the index admission. However, the data is less clear in regards to patients who undergo endoscopic sphincterotomy prior to surgery. While it has been shown that these patients still benefit from cholecystectomy, the optimal timing of this intervention is not well defined.

Hypothesis: Delayed cholecystectomy following endoscopic sphincterotomy for mild biliary pancreatitis is associated with significant preventable morbidity.

Methods: A retrospective chart review was performed at two academic hospitals for patients diagnosed with biliary pancreatitis who underwent endoscopic sphincterotomy followed by cholecystectomy. Patients aged 18 and over admitted from 2006 – 2011 were included, while those with severe pancreatitis were excluded. The primary outcome was biliary complications experienced during the waiting period for cholecystectomy. Secondary outcomes included length of stay, operative complications and conversion rate.

Results: 80 patient charts were reviewed. Time to cholecystectomy was 3.3 days (range 0.5-10) in the early group and 141.6 (range 18-757) in the delayed group. The groups were comparable in terms of age and American Society of Anesthesiologists (ASA) classification. 21 of 35 patients (60%) in the delayed group experienced biliary complications compared with 1 of 45 (2%) in the early group ($p < 0.001$). 14 patients in the delayed group required re-admission (40%) and 5 (14%) required additional procedures. Secondary outcomes were not statistically significant.

Conclusions: The data demonstrate a significantly increased biliary complication rate associated with delayed cholecystectomy in this patient population. Early cholecystectomy should be strongly considered for patients with mild biliary pancreatitis even when endoscopic sphincterotomy has been performed pre-operatively.

B09 Jamil Manji, Otolaryngology

Title: Cytokine Markers as Predictive Tools in the Treatment of Chronic Rhinosinusitis with Leptospermum Honey

Jamil Manji¹, Andrew Thamboo², San Sunkaraneni¹, Amrit Singh², Al-Rahim Habib¹, Scott Tebbutt², Cathie Garnis², Amin Javer^{1, 3} St. Paul's Sinus Centre, Department of Surgery, Division of Otolaryngology; ²PROOF Centre, Department of Medicine, Division of Respiratory Medicine; ³BC Cancer Research Centre, Department of Surgery, Division of Otolaryngology

Background: Leptospermum (Manuka) Honey (LH) is a natural immunomodulatory and antimicrobial agent. As a topical wound-healing agent, LH is gaining traction as an adjunctive postoperative therapy for patients suffering from chronic rhinosinusitis (CRS). CRS is an inflammatory disorder affecting the mucosa of the nose and paranasal sinuses. Previously, the effect of LH on tissue cytokine expression had only been studied *in-vitro*.

Objectives: (1) To identify differences in cytokine expression between tissues from patients using LH irrigation versus normal saline irrigation twice-daily for twelve weeks following sinus surgery (FESS) and (2) to determine whether cytokines expressed in sinus tissue obtained intraoperatively could be predictive of a clinical response to postoperative LH therapy. Our hypothesis is that LH is immunomodulatory and influences postoperative recovery by regulating specific inflammatory mediators that facilitate wound healing in CRS.

Methods: A randomized, single-blind, controlled trial was conducted at a tertiary rhinology center. Following functional endoscopic sinus surgery (FESS), CRS patients were randomized to receive either LH-impregnated nasal irrigation or normal saline (NS) nasal irrigation. Sinus tissue biopsies were collected during FESS and postoperatively over a course of LH or Saline treatment. A Luminex multi-plex array was used to quantify the expression of 17 cytokines in tissue samples. Cytokine expression fold-change was analyzed over the 12-week course of treatment using a robust linear regression model. Cytokines expressed intraoperatively were quantified and correlated to postoperative outcomes to determine candidate cytokine biomarkers.

Results: Forty-three CRS patients were included in the study. When compared with saline control patients, three cytokines were uniquely expressed (CI=95%) in tissue from the LH group over twelve weeks of treatment: IL-6 ($p = 0.0400$), IL-8 ($p = 0.0398$), MCP-1 ($p = 0.0284$), IL-13 ($p = 0.0085$), and MIP-1 β ($p = 0.016$). Differentially expressed cytokines, IL-13 and IL-8, were associated with patients who responded optimally to LH treatment but not in those patients who responded poorly or those responding to NS irrigation.

Conclusion: Leptospermum (Manuka) Honey has the effect of up-regulating IL-6, IL-8, MCP-1, IL-13, and MIP-1 β in sinonasal epithelial tissue. Levels of cytokines IL-13 and IL-8 expressed in sinus mucosal tissue could be predictive markers of optimal response to postoperative Leptospermum Honey therapy.

B10 Harman S. Parhar, Otolaryngology

Title: The Inter-Rater and Intra-Rater Reliability of the Philpott-Javer Endoscopic Mucosal Staging System Following Sinus Surgery Based on Level of Training in Otolaryngology

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Background: The Philpott-Javer endoscopic mucosal staging system for allergic fungal rhinosinusitis has previously demonstrated acceptable inter-rater reliability among rhinologists. There are, however, numerous otolaryngology learners involved in assessing patients post-operatively following sinus surgery at academic teaching hospitals.

Objectives: This study aims to analyze the inter-rater and intra-rater reliability of this system among otolaryngology learners at different stages in training.

Methods: A retrospective review of 3 photographs from each of 50 patients undergoing routine post-surgical nasoendoscopy in January 2013 was performed at an academic teaching hospital. Images were played twice, one week apart, in a randomized loop and scored according to Philpott-Javer criteria by a rhinologist, a rhinology fellow, a senior otolaryngology resident, a junior otolaryngology resident and a medical student. Inter-observer reliability was assessed using the intra-class correlation coefficient while intra-rater reliability was assessed by Shrout-Fleiss kappa values. Agreement between each learner and the rhinologist was also assessed using kappa values.

Results: The inter-class correlation between the 5 raters was 0.7600 (95% CI: 0.6917, 0.8161) for the Philpott-Javer scoring system, suggesting substantial reliability. Intra-rater data showed substantial to almost-perfect reliability (kappa values between 0.668 and 0.815) among all raters using this system. There was also moderate to substantial agreement between the learners and the rhinologist (kappa values between 0.534 and 0.710).

Conclusions: Results suggest that the Philpott-Javer staging system has acceptable intra-rater and inter-rater reliability among learners of differing levels of clinical experience and is suitable for evaluating progress following surgery. Our results suggest this method of tracking disease progression can be easily learned and applied by novice learners and enable them to become increasingly involved in patient care as they progress in training.

B11 Albert Tu, Neurosurgery

Title: Resident Migration Patterns

Albert Tu, Brian Toyota

Background: The American Board of Neurological Surgery (ABNS) is the body awarding certification of competency in neurological surgery in the USA. While it does not define practice privilege, recognition is necessitated by many institutions. Application was open to residents entering Canadian programs prior to 1997; however has since been only available to Accreditation Council for Graduate Medical Education (ACGME) recognized programs, excluding Canadian schools. This study asks whether this change has affected education and employment opportunities for graduating neurosurgeons.

Methods: All neurosurgical residency programs in Canada were invited to participate. Programs were asked to provide lists of graduates from 2012 to 1984. Graduates were sorted by year of graduation into pre or post 2003 (ie. 6 years after 1997) and further training and employment information, if not provided, was gathered from public domain resources.

Results: 50% of programs participated in this study for 220 graduating residents. There was no difference in proportion of American fellowships obtained relative to graduation date. The proportion of American consultant positions declined from 36.4% to 28% after 2003. This difference was statistically significant. Overall proportions of residents obtaining any fellowship or consultancy position did not change.

Conclusion: Changes in ABNS eligibility did not obviously affect the proportion of American fellowships while consultancy positions did decrease. The aetiology may be multifactorial, including coinciding evolving economics and hiring trends. Overall proportions of residents finding employment or fellowships were not affected. Future study may delineate the other factors that influence migration and assist future residency planning.

B12 Allison Y. Ye, Radiation Oncology

Title: Patterns of Radiation Oncology Follow-up in Canada

Allison Y. Ye¹, Winson Y. Cheung², Karen J. Goddard¹, Daniel Horvat³, Robert A. Olson⁴ ¹Department of Radiation Oncology, ²Department of Medical Oncology, Vancouver Cancer Centre, British Columbia Cancer Agency, Vancouver, British Columbia, Canada; ³Northern Medical Program, Faculty of Medicine, University of Northern British Columbia, Prince George, British Columbia, Canada; ⁴Department of Radiation Oncology, Center for the North, British Columbia Cancer Agency, Prince George, British Columbia, Canada

Background: With continual advancements in cancer care, improved outcomes and increasing survivor populations, cancer survivorship has become an important area of research.

Objectives: This project seeks to determine the current status of follow-up care in oncology.

Methods: A 35-question electronic survey was sent to physician members of the Canadian Association of Radiation Oncology. Based on their scope of practice, respondents were presented with brief clinical scenarios pertaining to various survivor populations. A subsequent series of questions were posed to determine routine follow-up practices.

Results: In total, 111 radiation oncologists (RO) responded (44% response rate); 29% were female, 43% were in practice less than 10 years, and most regions of Canada were well represented. Most worked in centers staffed by more than 10 oncologists (69%), and saw more than 200 new patient consults per year (78%). 10% would not follow patients routinely, mainly in cases involving breast cancer survivors. 73% of such patients would be followed by their primary care providers (PCP) whereas most ROs would follow their central nervous system, gastrointestinal, head and neck, gynecologic patients and genitourinary patients. Lack of resources and a belief that follow-up by PCPs is equally effective were the top two reasons for not following patients. Treatment toxicity and the possibility of salvage or palliative treatment were the two most common reasons for routine follow-up by ROs. The majority (55%) of ROs follow patients for < 5 years, with 36% following for 5-10 years, and a minority (9%) following for longer than 10 years. 54% would not change the frequency of their follow-up, but 39% would decrease and only 7% would increase their follow-up. Workload and lack of resources were major barriers to follow-up, but in addition, many felt that follow-up by FPs or Advanced Practice Nurses could be equally effective. Some felt this would require additional training and more guidelines to make this effective.

Conclusions: The majority of respondents stated they would follow the patients presented in the clinical scenarios, especially when salvage treatment is possible. A proportion would decrease their follow-up frequency because of workload burden, resource limitations and a belief that there can or should be increased involvement from FPs and other allied health care providers.

B13 Siham Zerhouni, General Surgery

Title: Analysis of Human Peritoneal Carcinomatosis Samples Infected with Oncolytic Viruses

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Background: Peritoneal carcinomatosis (PC), the intra-abdominal dissemination of malignancy, is equated with a 5-year survival of 15%, depending on the source. Appendiceal PC is a challenge to treat as cancer cells are embedded in copious amounts of mucin and are difficult to target. Oncolytic viruses (OVs) preferentially replicate and lyse cancer cells and present a targeted, novel strategy for PC.

Hypothesis: Appendiceal PC will show variable susceptibility to OVs and that protein expression in these tumours will predict OV replication efficiency.

Methods: Prospectively, patient PC samples were obtained from the operating room and infected ex-vivo with vaccinia virus, herpes virus, maraba virus and farmington virus for 48 to 72 hours. Samples were visualized under fluorescent microscopy and titered by plaque assay. Matched samples were stained by immunohistochemistry (IHC) for 3 proteins (phosphorylated extracellular regulatory kinase, thymidine kinase and interferon regulatory factor 3). Protein expression was correlated with virus replication for each OV. Alamar blue assay was performed on samples to determine viability.

Results: Human appendiceal PC maintained viability for 72 hours. Human PC samples infected ex-vivo with 4 different OVs displayed variable infectivity and replication by fluorescent microscopy and plaque assay. Immunohistochemistry analysis revealed differential expression of IRF3, pERK and TK in tumour compared to normal appendix. No significant correlation of expression of these protein with viral replication was observed. A trend towards a positive relationship between pERK and vaccinia virus replication was noted.

Conclusion: Patient PC samples show variable susceptibility to a panel of OVs. As OVs are increasingly administered to patients, it will become imperative to identify markers of susceptibility in order to offer a personalized approach to OV therapy.

Simultaneous Session C

C01 Samuel Chow, General Surgery

Title: Gp130 receptor signalling mediates alpha cell dysfunction in a rodent model of type 2 diabetes

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Background: Glucose homeostasis is tightly regulated by the pancreatic islet-derived hormones insulin and glucagon. Dysregulated glucagon secretion from pancreatic α cells accompanies islet inflammation in type 2 diabetes (T2D). Recent human data showed increased IL-6 family cytokine expression in T2D islets in a global gene expression study. We recently discovered that IL-6 stimulates glucagon secretion from human and rodent islets. Cytokines of the IL-6 family all require the gp130 receptor to signal. Therefore, we set out to elucidate the role of the α cell gp130 receptor during T2D.

Objective: To elucidate the effects of α cell gp130 receptor signalling on glycemic control in T2D.

Methods: Islet gene expression analysis was performed in rodent models of T2D. Primary α cells were studied to assess gp130 receptor signalling and glucagon secretion. Pancreatic α cell gp130 receptor knockout (α gp130KO) mice were generated and subjected to streptozotocin (STZ) plus high fat diet (HFD) to induce islet inflammation and pathophysiology modelling T2D. In vivo phenotyping was performed to assess effects on glycemic control and α cell function.

Results: IL-6 family cytokines were elevated in islets in rodent models of T2D. IL-6 induced STAT3 activation in primary α cells and stimulated glucagon secretion in a gp130 receptor-dependent manner. Pancreatic α gp130KO mice showed no differences in glycemic control, α cell function or α cell mass. However, STZ/HFD treated α gp130KO mice had reduced fasting glycemia, improved glucose tolerance, improved α cell function, and no changes in α cell mass. Hyperinsulinemic-euglycemic clamps revealed no differences in insulin sensitivity.

Conclusions: We conclude that in a setting of increased islet inflammation such as observed in T2D, activation of α cell gp130 receptor signalling has long-lasting deleterious effects on α cell function, promoting hyperglycemia. Antagonism of α cell gp130 receptor signalling may be useful for the treatment of T2D.

C02 Christopher Dickman, Otolaryngology

Christopher TD Dickman, Sara Maclellan, Rebecca Towle, Cathie Garnis

Title: Exosomal microRNA selection in oral tumorigenesis Using Transcription Activator-like Effector Nucleases (TALENs) and Clustered Regularly Interspaced Short Palindromic Repeats (CRISPRs) to Generate Human Embryonic Stem Cell Reporter Lines.

Background: Exosomes are small vesicles approximately 100nm in size secreted from cells with selectively packaged miRNAs, as well as other RNAs and proteins. miRNAs have been linked to tumour suppressing and oncogenic roles in cancer. Identifying miRNAs selectively released or retained from oral cancer cells will yield novel insights into miRNA-driven cancer processes and uncover potential therapeutic targets for treatment of oral cancer.

Objective: To identify microRNA candidates that are selectively retained or released from cells via exosomes in oral cancer.

Methods: Using a panel of oral cancer cell lines exosomes were isolated from cell culture media using differential centrifugation. Electron microscope imaging and western blots using antibodies for CD63 and TSG101 confirmed exosomes isolation. RNA was extracted from both the exosomes and the paired cell lines. miRNA expression was determined using miRNA PCR panels. miRNAs were determined to be selectively retained if they were at least two fold higher in the cells relative to the exosomes. miRNAs that were at least two fold higher in the exosomes relative to the cells were considered selectively released. Candidates were those miRNAs that were selectively secreted or retained in every cell line/exosome pair. These candidates were compared to results previously obtained from the serum miRNA expression patterns of individuals with oral cancer and precancer.

Results: There were 7 miRNAs that were 2 fold higher in each cell line relative to the exosomes and 40 miRNAs that were 2 fold higher in the exosomes relative to the cell lines. Many of these selectively excreted cell lines were also highly expressed in serum samples. **Conclusion:** We have identified potentially important miRNAs for the progression of oral cancer. We have shown a trend that miRNAs are more commonly selectively secreted rather than selectively retained.

C03 Nicole Krentz, General Surgery

Title: Using Transcription Activator-like Effector Nucleases (TALENs) and Clustered Regularly Interspaced Short Palindromic Repeats (CRISPRs) to Generate Human Embryonic Stem Cell Reporter Lines.

Nicole A. J. Krentz^{1,2} and Francis C. Lynn^{1,2} (1) Diabetes, Nutrition and Metabolism, Child and Family Research Institute, Vancouver, BC (2) Department of Surgery, University of British Columbia, Vancouver, BC

Background: Human embryonic stem cells (hESC) have been proposed as an unlimited source of transplantable cells for the treatment of many diseases, including the production of insulin-producing beta cells for diabetes therapy. The development of efficient differentiation protocols has been hindered, as currently there are no lines that allow visualization of stepwise differentiation. The production of efficient differentiation protocols will require the generation of reporter hESC lines where markers of different cell types are co-expressed with fluorescent proteins. Previously this has been difficult to accomplish as homologous recombination is very inefficient in hESC but, with the recent advances in engineered nucleases, genome editing is fast becoming a reality. For this project we used both transcription activator-like effector nucleases (TALENs) and Clustered Regularly Interspaced Short Palindromic Repeats (CRISPRs) that can be designed to bind to particular genomic sequences and generate double-stranded breaks where, with the addition of a donor plasmid, a fluorescent protein can be inserted via homologous-directed repair.

Objective: To use TALENs and CRISPRs to produce reporter lines for human embryonic stem cells to aid in the development of differentiation protocols for diabetes treatment.

Results: Using the CyT49 hESC line we were able to generate a C-terminal OCT4-eGFP-2A-Puro fusion cell line. GFP remains expressed in the nucleus through several passages in culture and quickly disappears upon differentiation towards pancreas. This genetically engineered line is able to differentiate at the same efficiency towards pancreatic progenitor cells as the parent CyT49 line. We have also recently produced a PDX1-2A-mCherry-PGK-Puro CyT49 line and are in the process of characterizing the expression of PDX1 during differentiation towards pancreas and endocrine cells.

Conclusions: TALENs and CRISPRs are an efficient tool for the production of hESC reporter lines.

C04 Yoo Jin Park, General Surgery

Title: The IL-1 Receptor Antagonist Anakinra Reduces Amyloid β -Cell Toxicity and Improves Survival and Function of Human Islets: Implications in Clinical Islet Transplantation

Yoo Jin Park*, Ziliang Ao, Nooshin Safikhani, Garth L. Warnock, Lucy Marzban, Division of General Surgery, Department of Surgery, University of British Columbia

Introduction: In past decade, human islet transplantation has provided a promising approach for treatment of type 1 diabetes (T1D). It is however currently limited by low number of pancreatic donors and islet loss during both pre-transplant culture and post-transplantation that eventually leads to graft failure in most patients. Islet amyloid, formed by aggregation of human islet amyloid polypeptide (hIAPP), is a pathologic characteristic of pancreas in type 2 diabetes (T2D) that also forms in cultured and transplanted islets. Importantly, hIAPP aggregates are toxic to β -cells and contribute to β -cell death in all conditions associated with islet amyloid formation such as in T2D, islet culture, and transplantation. The mechanism(s) by which hIAPP aggregates mediate β -cell death are still unclear. We recently showed that endogenously formed hIAPP aggregates induce upregulation of cell death receptor Fas in β -cells which is likely mediated by IL-1 β .

Objectives: In this study, we tested if blocking IL-1 β action by treatment with Anakinra (Kineret), a clinically approved IL-1 receptor antagonist, can reduce amyloid toxicity thereby enhance survival and function of isolated human islets during pre-transplant culture as a potential approach to improve quality and/or quantity of islets for transplantation.

Methods: Freshly isolated human islets (n=6 donors) were cultured in CMRL with normal (5.5 mM) or elevated glucose (11.1 mM; to potentiate amyloid formation) in the presence or absence of Anakinra (10 µg/ml) for up to 7 days. Islet IL-1β level, amyloid formation, β-cell Fas expression and apoptosis were assessed by ELISA, immunolabeling, and TUNEL, respectively. β-cell function was assessed by measuring insulin response to elevated glucose and islet insulin content (ELISA).

Results: hiAPP aggregates were present in cultured (but not freshly isolated) human islets which was associated with increased islet IL-1β immunoreactivity, Fas upregulation, and progressive β-cell apoptosis. IL-1β release from human islets during culture correlated with amyloid formation. Interestingly, Anakinra-treated islets had reduced Fas expression, lower β-cell apoptosis, and greater insulin response to elevated glucose as compared to non-treated cultured human islets. Blockade of IL-1 receptor by Anakinra was assessed by detection of IL-1β immunoreactivity in Anakinra-treated cultured human islets.

Conclusions: In summary, these data suggest that amyloid-induced Fas upregulation is associated with IL-1β release from human islets during culture resulting in β-cell death. Therefore, treatment with IL-1 receptor antagonists may provide a new approach to prevent amyloid β-cell toxicity, enhance islet survival and function during pre-transplant culture, and improve the outcome of clinical islet transplantation.

C05 Alexis Shih, General Surgery

Title: Roles of Anti-apoptotic Bcl-x_L in Pancreatic Beta-cell Mitochondrial Physiology and Oxidative Stress

Alexis Shih, Lerly Luo and Dan S. Luciano¹UBC, Department of Surgery, Division of General Surgery; Child & Family Research Institute, Diabetes Research Program, Vancouver.

Background: Chronic nutrient oversupply increases metabolic load and oxidative stress in the insulin-secreting pancreatic β-cells. Such conditions impair both function and survival of β-cells contributing to the development of type 2 diabetes. The proteins Bcl-2 and Bcl-x_L are pro-survival members of the B-cell lymphoma 2 (Bcl-2) family, which regulate programmed cell death by apoptosis. We have previously shown that Bcl-2 and Bcl-x_L also suppress glucose signalling in the β-cell. Interestingly, studies from neurons report that Bcl-x_L also affects mitochondrial morphology and networking.

Hypothesis: Bcl-x_L protects β-cells from nutrient-induced stress 'upstream' of apoptosis by regulating mitochondrial morphology and metabolic flux.

Methods: To investigate the potential moment-to-moment roles of endogenous Bcl-x_L and in the regulation of reactive oxygen species (ROS) and cell survival, we treated MIN6 β-cells with the Bcl inhibitor compound 6 (C6) in the presence or absence of the antioxidant N-acetyl-cysteine (NAC). To determine the role of Bcl-x_L in β-cell survival under conditions of chronic glucotoxicity and glucolipotoxicity we examined dispersed islet cells from inducible β-cell specific Bcl-x knockout (Bcl-x βKO) and wild-type (WT) control mice. Lastly, we use transient overexpression of YFP-tagged Bcl-x_L (YFP:Bcl-x_L) to determine the involvement of Bcl-x_L in regulation of β-cell mitochondrial morphology.

Results: Prolonged treatment with C6 triggered MIN6 β-cell death, which was prevented by addition of NAC. After 48-hour culture in 25 mM glucose and 1.5 mM palmitate, Bcl-x WT and βKO islet cells showed significantly increased cell death. Surprisingly, the glucolipotoxicity-induced cell death of Bcl-x WT and βKO islet cells was potentiated by NAC, suggesting pro-survival roles for ROS. We observed that Bcl-x_L:YFP localizes to the mitochondria and promoted aggregation of the organelle.

Conclusions: Our results demonstrate that acute Bcl-2/Bcl-x_L inhibition triggers ROS- dependent β-cell death, suggesting that Bcl proteins may constitutively suppress β-cell ROS formation. Preliminary data further implicate Bcl-x_L in the control of β-cell mitochondrial fusion-fission; processes that are suggested to affect beta-cell susceptibility to nutrient-induced stress. Further clarifying these roles of Bcl-x_L will improve our understanding in the pathogenesis of type 2 diabetes.

C06 Thilo Speckmann, General Surgery

Title: Mechanisms of Npas4 Induction

Thilo Speckmann, Paul Sabatini, Cuilan Nian and Francis Lynn, Department of Surgery & Child and Family Research Institute

Background: Elevated blood sugar levels stimulate pancreatic beta cells to release the hormone insulin, which instructs peripheral tissues to take up glucose and restore normoglycemia. In type 2 diabetes, persistent physiological stress can drive beta cell death, leading to chronic hyperglycemia including long term health effects such as retinopathy, nephropathy and neuropathy. A recent study from our group shows that Npas4, a calcium-dependent transcription factor, is rapidly induced in beta cells in response to physiological beta cell stressors such as high glucose or the fatty acid palmitate. In addition, *in vitro* overexpression of Npas4 protected beta cells from stress-induced apoptosis. It is, thus, an interesting candidate for the treatment of type 2 diabetes. Interestingly, removal of stimulatory conditions or continuous exposure to stressors leads to a decline in Npas4 expression and we hypothesize that if Npas4 expression could be stabilized, it might be possible to further mitigate beta cell stress and death.

Objective: My current research aims to identify the calcium-dependent signalling pathways that induce Npas4 expression in beta cells, as well as elements that stimulate its degradation.

Methods: Npas4 expression was induced by depolarization in a high glucose and high potassium medium (DMEM High/KCl), triggering calcium (Ca²⁺) influx. Since Ca²⁺ is essential for Npas4 expression, pharmacological antagonists of major Ca²⁺ signalling pathways were applied *in vitro* using the murine beta cell line MIN6, and changes in Npas4 mRNA levels were detected by real-time PCR.

Results: Under stimulatory conditions Npas4 mRNA levels were reduced by addition of the CaMKII inhibitors KN-93 and AIP, the calcineurin inhibitor FK-506 and Compound C, an AMPK inhibitor. The most potent inhibition was achieved with KN-93, reducing Npas4 mRNA by 75-93%. The more specific but less cell-permeable peptide inhibitor AIP decreased Npas4 by 35%. Different doses of FK-506 resulted in a consistent reduction of 30-35% and Compound C inhibition ranged between 27-42%.

Conclusions: A CaMKII-dependent signalling cascade appears to be the major mechanism of Npas4 induction in beta cells. However, calcineurin also contributes to initiate Npas4 expression. It is noteworthy that FK-506, used as immunosuppressant, inhibits Npas4 within therapeutic ranges, since the drug can cause new-onset diabetes after transplantation that may be partially driven through a reduction in Npas4 levels. In conclusion, multiple signalling cascades contribute to Npas4 expression. Future studies will be aimed at understanding if these same signalling pathways also regulate Npas4 protein levels. In addition, effects of small molecule activators of CaMKII on Npas4 expression will be tested. Simultaneously, we will work on identifying elements that may contribute to Npas4 degradation.

C07 Annika Sun, General Surgery

Title: Novel roles of B7-H4 in β-cell ER stress signaling and β-cell survival

Annika Sun^{1,2,3}, Dan Luciano^{1,2}, Garth Warnock^{1,3,1} Department of Surgery, University of British Columbia² Child and Family Research Institute, Diabetes Research Program³ Vancouver General Hospital, Vancouver, BC

Background: Recent studies regarding islet transplantation show that ER stress may be activated in pancreatic islets during the isolation and transplantation process, which contributes to apoptosis and cell death in grafts. The B7-H4 molecule is abundantly expressed in various tumor cells, and may mediate tumorigenesis through anti-apoptotic effects. Because B7-H4 mRNA is also highly expressed in pancreatic β-cells, it is possible that it may have anti-apoptotic effects on β-cells as well.

Objectives/Hypothesis: We want to examine whether B7-H4 can protect β-cells from ER stress-induced cell death. We hypothesize that B7-H4 promotes β-cell survival and inhibits apoptosis by modulating the Unfolded Protein Response.

Methods: Isolated islets from B7-H4 transgenic and age-matched control mice were treated with the chemical stressor thapsigargin to elicit ER stress-induced cell death. In addition, isolated islets from both sets of animals were also treated with a low dose to thapsigargin to induce ER stress, and RT-PCR was performed to examine the changes in expression of UPR genes.

Results: Preliminary results show that following 48-hours treatment with thapsigargin, B7-H4 transgenic islets exhibit lower level of cell death as compared to control islets. Real-time PCR quantification demonstrated significantly higher expression of Bip, CHOP, and spliced Xbp1 in the transgenic islets as compared to wild-type islets 12 hours following treatment.

Conclusions: Our findings suggest that over-expression of B7-H4 may regulate UPR signaling and inhibit ER stress-mediated apoptosis in β -cells. Further study of these novel pro-survival roles may suggest new approaches for prolonging islet graft survival, and by promoting the survival and function of endogenous β -cells.

C08 Rebecca Towle, Otolaryngology

Title: Identification of Genes Disrupted by DNA Methylation in Oral Cancer Progression Through Integrative Analysis

Rebecca Towle, Kirsten Hogg, Wendy P. Robinson, Catherine F. Poh and Cathie Garnis

Objectives: Oral cancer is the most common form of head and neck malignancy, and has a dismal survival rate of ~50% over five years. A major contributor to this low survival is our inability to differentiate a lesion at risk for progression at the earliest stages of this disease. A better understanding of the molecular mechanisms at play throughout the different stages of this disease is essential in order to improve survival rates. Our objectives are to identify genes deregulated through altered DNA methylation in oral cancer and to gain a better understanding of pathways involved in OSCC progression.

Material and Methods: Multiple biopsies were obtained from an oral cancer (OC) field exhibiting hyperplasia, dysplasia and carcinoma in situ (CIS)/ squamous cell carcinoma (SCC) from ten patients. DNA and RNA from microdissected tissue samples were extracted. DNA methylation levels were obtained using the Illumina Infinium HumanMethylation27K microarray, and gene expression levels were assessed using the Agilent Human Gene Expression 4x44k microarray. Significant genes were identified using a Wilcoxon signed rank test. Data from both platforms were integrated and candidate genes identified.

Results: We identify numerous genes that exhibit both aberrant methylation and matched altered gene expression. In both oral dysplasias and CIS/SCC tissue samples, we identify recurrently aberrantly methylated genes in both the WNT and TGFbeta pathways. In oral dysplasias we observe recurrent hypermethylation of PEG10 (3 out of 10 cases) and SOX17 (4/10). These genes have roles in the TGFbeta and WNT signal transduction pathways, respectively, and crosstalk between these two pathways has been observed previously in tumorigenesis. In the CIS/SCC biopsies, we observe recurrent hypermethylation of EYA2 (5/10), NDRG2 (4/10), and WIF1 (4/10). These genes also play a role in the TGFbeta and WNT pathways.

Conclusion: This is the first report integrating profiles of DNA methylation and gene expression data for different histological stages of OC. Given the frequency of methylation and expression correlating with one another, we demonstrate that methylation is one of the critical mechanisms in OC progression.

C09 Clara Westwell-Roper, General Surgery

Title: Macrophage interleukin-1 secretion mediates human islet amyloid polypeptide-induced islet graft dysfunction and amyloid formation

Clara Y. Westwell-Roper^{1,2}, Jan A. Ehse³, and C. Bruce Verchere^{1,3} ¹Department of Pathology & Laboratory Medicine; ²MD/PhD Program; ³Department of Surgery Child & Family Research Institute, University of British Columbia

Background: Aggregation of human islet amyloid polypeptide (hIAPP) to form amyloid contributes to beta cell dysfunction during pre-transplant islet culture and following islet transplantation. hIAPP aggregates share a common cross beta-sheet structure with other amyloids that induce a potent pro-inflammatory response by activating Toll-like receptor 2 (TLR2) leading to release of interleukin-1 β (IL-1 β). To determine whether hIAPP induces a similar pro-inflammatory response, we evaluated the capacity of hIAPP to activate TLR2 and assessed the effect of IL-1 receptor antagonist (IL-1Ra) on hIAPP-induced islet graft dysfunction.

Methods: Islets from wild-type and *Tlr2*^{-/-} mice were treated with hIAPP (10 μ M) or non-amyloidogenic rodent IAPP and assayed for pro-inflammatory cytokine expression by qRT-PCR and flow cytometry. The contribution of resident macrophages to hIAPP-induced IL-1 β expression was assessed following phagocyte depletion with clodronate-containing liposomes. To evaluate the functional effects of IL-1 blockade *in vivo*, donor islets were isolated from wild-type FVB mice or littermates expressing hIAPP under the control of a beta-cell-specific promoter. 150 islets were transplanted under the kidney capsule of streptozotocin-induced NOD/SCID recipients implanted with a mini-osmotic pump containing IL-1Ra (50 mg/kg/d) or saline. Graft function was evaluated by intraperitoneal glucose tolerance testing after eight weeks. Amyloid was quantified by Thioflavin-S staining.

Results: Synthetic human but not rodent IAPP induced expression of mRNA encoding the pro-inflammatory cytokines IL-1 β (4.5 \pm 1.2 fold untreated; p <0.05), TNF- α (10.3 \pm 0.7; p <0.001), IL-6 (117 \pm 56; p <0.001), and CCL2 (10.2 \pm 0.6; p <0.001) in islets after 4 hours. Clodronate-mediated macrophage depletion attenuated hIAPP-induced pro-inflammatory cytokine expression. Upregulation of IL-1 β , TNF- α , IL-6, and CCL2 was attenuated in *Tlr2*^{-/-} islets, suggesting that TLR2 is required for the pro-inflammatory response to IAPP. Recipients of transgenic islet grafts displayed impaired glucose tolerance compared to recipients of wild-type grafts (area under the curve (AUC) = 1940 \pm 80 vs. 1260 \pm 60, p <0.001). Administration of IL-1Ra significantly improved graft function in recipients of transgenic grafts (AUC = 1470 \pm 160 vs. 1940 \pm 80, p <0.005) but not wild-type grafts, suggesting an important role for IL-1 in mediating hIAPP-induced islet inflammation and dysfunction. A 70% reduction in amyloid area was observed in transgenic grafts from IL-1Ra-treated recipients, suggesting that hIAPP aggregation may not only contribute to IL-1 release but may also be a consequence of islet inflammation.

Conclusions: These data suggest that resident islet macrophages are the major source of IAPP-induced IL-1 in cultured islets and that TLR2 signalling mediates this response. Importantly, IAPP aggregation in transplanted islets contributes to islet dysfunction in an IL-1-dependent manner. Thus, anti-IL-1 therapy may improve graft function in human islet transplant recipients by inhibiting IAPP-induced inflammation and/or attenuating amyloid formation.

C10 Yun Zhang, General Surgery

Title: Three-Dimensional Collagen Matrix Restores Reduced Levels of PKB Phosphorylation Associated with Amyloid Formation in Cultured Islets

Yun Zhang, Garth L. Warnock, Ziliang Ao, Nooshin Safikhani, Aziz Ghahary, Lucy Marzban, Department of Surgery, Faculty of Medicine, University of British Columbia

Introduction: Human islet transplantation provides a feasible approach for treatment of type 1 diabetes (T1D) but is currently limited by insufficient donors and loss of beta cells during pre-transplant culture and in islet grafts. Aggregation of human islet amyloid polypeptide (hIAPP), a hallmark of pancreas in T2D, also occurs during islet culture and post-transplantation. hIAPP aggregates contribute to beta-cell death and dysfunction in all three conditions. Protein kinase B (PKB) signaling pathway plays a key role in the regulation of beta-cell survival, function and proliferation.

Hypothesis: Amyloid formation in islets is associated with reduced phospho-PKB levels. Prevention of hIAPP aggregation may restore phospho-PKB levels thereby enhancing islet survival and function during pre-transplant culture period.

Methods: Transformed beta cells treated with hIAPP, and human and transgenic mouse islets cultured to form amyloid, were used to examine the effects of exogenous and endogenous hIAPP aggregates on PKB phosphorylation, respectively. Human islets embedded in collagen matrix were used as a potential approach to restore reduced PKB phosphorylation associated with hIAPP aggregation and enhance islet survival/function. Beta-cell phospho-PKB levels, apoptosis, and function were assessed by Western blot, quantitative immunolabelling, and glucose-stimulated insulin secretion test, respectively.

Results: Phospho-PKB levels were markedly lower in hIAPP-treated INS-1 beta-cells compared to those treated with non-fibrillogenic rat IAPP and non-treated cells. Decreased phospho-PKB in hIAPP-treated beta cells was associated with reduced proliferation and increased apoptosis. Transgenic hIAPP-expressing mouse islets formed hIAPP aggregates during culture and had markedly lower beta-cell phospho-PKB than wild-type islets, both of which were prevented by the amyloid binding dye Congo red. Human and hIAPP-expressing mouse islets embedded in collagen matrix had significantly lower hIAPP aggregation and beta-cell death, higher phospho-PKB levels, insulin response to glucose, and insulin content than free-floating cultured islets.

Conclusions: Exogenously applied and endogenously formed hIAPP aggregates reduce PKB phosphorylation in islet beta cells. Collagen matrix restores reduced phospho-PKB levels associated with hIAPP aggregation and enhances beta-cell survival and function during pre-transplant islet culture.

Evening Program



6:00 pm - Cocktails
 6:30 pm – Presentation
 7:00 pm – Dinner reception

The Museum of Vancouver (MOV) presents Vancouver-focused exhibits and programs that encourage dynamic conversations about what was, is, and can be Vancouver. Permanent exhibits tell

the city's stories from the early 1900s to the late 1970s and are complemented by contemporary, groundbreaking feature exhibits. Since its rebranding in 2009 the MOV has become a leader in the re-imagining of museums.

Location: 1100 Chestnut Street (Vanier Park), Vancouver

2013 Department of Surgery Faculty Achievement Awards

Hjalmar Johnson New Investigator Award – Dr. Cathie Garnis is an Assistant Professor in the Division of Otolaryngology, Department of Surgery at the University of British Columbia. She is also a Senior Scientist, Genetics Unit, Integrative Oncology Department, BC Cancer Research Centre. Dr. Garnis completed her undergraduate training at the University of British Columbia in 2000. She immediately began her graduate studies with Dr. Wam Lam at the BC Cancer Research Centre, her work focusing primarily on genomic alterations in oral and lung malignancies. Upon completion of her PhD in 2005, Dr. Garnis moved to Boston to undertake post-doctoral research at MIT with Dr. Phil Sharp (Nobel Prize in Physiology or Medicine, 1993). Her work in Boston was primarily focused on understanding molecular mechanisms of alternative splicing. Dr. Garnis returned to Vancouver where she is currently an Assistant Professor in and Director of Research of the Division of Otolaryngology.



Richard J Finley Senior Investigator Award – Dr. James Morris is a Clinical Professor in the Division of Radiation Oncology and Developmental Radiotherapeutics in the Department of Surgery at the University of British Columbia. He is Director of GU Radiation Oncology at the BCCA – Vancouver Centre; Principal Investigator for the Developmental Brachytherapy BCCA – Vancouver Centre; and Chair of the Provincial Prostate Brachytherapy Quality Assurance Committee. Dr. Morris has been instrumental in developing a highly productive multidisciplinary team with researchers from the Electrical and Computer Engineering Department at UBC investigation advanced imaging systems to enable intraoperative prostate brachytherapy. He is the principal investigator for a new (formed Oct 2011) multidisciplinary team investigating the role of focal brachytherapy. The team includes world-class researchers from the Vancouver Cancer Center (of the BXCCA), the BCCA Centre for Functional Imaging, the BC Cancer Research Centre, the UBC Prostate Centre, the Genome Sciences Centre, and the UBC Department of Electrical and Computer Engineering.



Kudos & Congratulations 2013



Dr. Megan Levings (General Surgery) has received a grant to study **“The role of FOXP3 and IL-1-family cytokines in regulating CD4+ T cell subsets in healthy humans, and in patients with chronic skin inflammation.”** The immune system is designed to recognize the difference between harmful and non-harmful foreign proteins, and to not react against proteins that normally exist in an individual. When the processes controlling these functions breakdown, diseases such as autoimmunity and allergy can result. Although many cell types work together to regulate immune responses, one of the major players is the CD4+ T cell. Dr. Leving’s lab has discovered new pathways of regulation, and proposes to study these pathways to better understanding of how CD4+ T cells can cause disease and to make use of this knowledge to help patients with chronic inflammatory diseases.



Dr. Lucy Marzban (General Surgery) has received a grant to study **“Molecular mechanisms of islet amyloid mediated beta cell death”**

Type 2 diabetes (T2D) is characterized by progressive dysfunction and death of insulin producing beta cells in the pancreas which results in elevated blood glucose levels. Patients with T2D have protein amyloid in their islets. Amyloid deposits are toxic to beta cells and contribute to progressive beta cell death in patients with T2D. Dr Marzban’s group will investigate the molecular mechanisms by which amyloid formation destroys beta cells with the aim of developing therapeutic approaches to preserve insulin producing beta cells.



Dr. Alice Mui (General Surgery) has received a grant to study **“Negative Regulation of Immune Cell Function”**

Although immune cell activation is an important host defense mechanism, this inflammatory reaction must be carefully regulated in order to avoid pathological consequences. Interleukin-10 (IL10) is a secreted protein which is a key inhibitor of immune cell activation. Dr Mui’s lab concentrates on characterizing IL10-induced signalling pathways in order to provide new insights into development of anti-inflammatory therapies for treatment of diseases such as inflammatory bowel disease, arthritis and organ rejection.



Dr. Hamish Hwang (General Surgeon, Vernon Jubilee Hospital) and **Dr. Ahmer Karimuddin (General Surgeon, St Paul’s Hospital, Vancouver, BC)** have just published a study in the BC Medical Journal showing that BC needs 74 more general surgeons. This article was profiled last week in the Vancouver Sun (Dr. Karimuddin pictured).

<http://www.vancouversun.com/Study+reveals+shortage+general+surgeons/7923246/story.html>



Dr. Desmond Nunez (Head, Otolaryngology) has received a grant from the BC Balance and Dizziness Disorders Society to study **“Does the location of injury in the vestibular system determine the severity of balance impairment?”**

Dizziness is a common complaint estimated to affect approximately 1 in 4 adults of all ages. In specialist dizziness clinics an inner ear cause can be identified in 51% of patients. New balance function tests allow the site of weakness in the inner ear balance system to be better determined. Dr Nunez and his co-researchers Dr. Art Mallinson and Dr. Neil Longridge based at the Vancouver General Hospital Neurotology unit will seek to investigate if damage to different areas of the inner ear balance system predicts the way in which patients are affected.



Congratulations to Dr. Pauline Truong, (Clinical Professor, Radiation Oncology) and her post-doctoral student, Dr. Nelson Leong, who have been awarded a year-long fellowship from the Canadian Breast Cancer Foundation, BC/Yukon Chapter. Dr. Leong will join the BC Cancer Agency and Division of Radiation Oncology and Developmental Radiotherapeutics in Victoria to study the risk of brachial plexopathy when adjuvant breast cancer nodal radiation therapy is delivered over 3.5 weeks compared to a more standard 5+ weeks of treatment. Dr. Truong has developed an international reputation for conducting and publishing innovative breast cancer outcomes projects and has successfully attracted a series of fellows to work on such projects

through the BC Cancer Agency centre in Victoria.



Dr. Nadine Caron (General Surgery) based in Prince George has received the Queen Elisabeth II Diamond Jubilee medal from Governor General David Johnson. Dr. Caron is an accomplished surgeon as well as contributes considerably to many communities and constituencies. She is a member of the: Governing Council of CIHR, Board of Director of MSFHR, and Research Advisory Committee of the Terry Fox Research Institute where she ensures the voices of Canada's northern, rural and Aboriginal populations is heard and respected. Dr. Caron is also an organizer of the Family Physicians and Extended Surgical Skills training in conjunction with the Society of Rural Physicians of Canada, an organization who honored her with their annual "Rural Service

Award" in 2012.



Dr. Carl Brown (General Surgery) has received a Business Vancouver "Top 40 under 40" award which recognizes outstanding leadership and community contributions of exceptional young professionals. Dr. Brown is a colorectal surgeon at St. Paul's Hospital where he has developed innovations which have reduced the invasiveness of life-saving procedures and shortens recovery times. As the president of the Providence Health Care Medical Staff Association, he also brings together more than 1000 physicians, surgeons and midwives to more effectively work together.



Dr. Cindy Verchere's (Plastic Surgery) decade long campaign to improve the safety of high efficiency gas fireplaces has resulted in industry-wide safety changes that were recently profiled in a front page story in the Vancouver Sun. The new standard requires all new products sold or installed to be supplied and shipped with a certified protective screen that will prevent people, especially small children, from accidental contact and subsequent severe burns.



Dr. Dan Luciani (General Surgery) has received a career development award from the international Juvenile Diabetes Research Foundation (JDRF) for "**Identifying and targeting novel cell death pathways in islet graft failure**". Today beta-cell replacement by pancreatic islet transplantation is one of the most promising treatments for type 1 diabetes. However, the procedure still faces serious hurdles, including an excessive amount of islet beta-cell death shortly after transplantation. Dr. Luciani's JDRF-funded project aims to use a combination of microscopy-based screens and mouse transplantation models to identify the cellular death mechanisms that mediate this beta-cell loss, and to determine how this knowledge can best be used to promote human islet graft survival and reach the goal of making clinical islet transplantation a cure for type 1 diabetes.



Dominika Nackiewicz, a PhD student with **Dr. Jan Ehses (General Surgery)** was awarded a CIHR Vanier Canada Graduate Scholarship for her project on "Using regulatory macrophages (Mregs) to promote beta cell regeneration during islet inflammation". This project aims to provide insight into understanding the role of macrophages in pancreatic islet inflammation and a possible use of regulatory macrophages as a new strategy to promote β cell regeneration and survival during diabetes and islet transplantation.

The purpose of the Vanier Scholarship program is to recruit students from abroad, and is awarded to the top students across Canada. Dominika comes to us from Poland after studying at the University of Virginia.



Congratulations to **Dr. Pauline Truong (Radiation Oncology)** on having one of her paintings accepted as the cover illustration on the International Journal of Radiation Oncology, Biology and Physics, the most widely read and respected journal in the field of Radiation Oncology.



Professor Aziz Ghahary, Director of the Burn and Wound Healing Lab in the Division of Plastic Surgery has accomplished work that has translated into a new diagnostic test for arthritis. Quest Diagnostics launched a new biomarker in the US which was the result of CIHR funded work by Aziz, with collaborators in Edmonton and elsewhere. It apparently has the potential to help identify early stage RA. Please see the press release at http://ir.questdiagnostics.com/phoenix.zhtml?c=82068&p=irol-newsArticle_Print&ID=1804803&highlight



Surrey patients with suspicious lung tumours are being diagnosed and surgically treated dramatically faster, due to a new streamlined Rapid Autopilot Program set up by a trio of thoracic surgeons led by **Dr. James Bond (Thoracic Surgery)** at Surrey Memorial Hospital. Patients are being diagnosed and treated within 45 days, according to results from the first year of the pilot project, compared to delays of up to 190 days before the program. This success was highlighted in a Vancouver Sun Story last week.

<http://www.vancouversun.com/touch/story.html?id=8263967>



Dr. Megan Levings, (General Surgery) is a leader in Canadian National Transplant Program, a scientist at the Child & Family Research Institute (CFRI) at BC Children's Hospital and Canada Research Chair in Transplantation. She and her collaborators have just received a multimillion dollar grant from CIHR and Genome British Columbia. <http://www.genomebc.ca/media/news-releases/2013/bc-researchers-leading-key-projects-for-new-canadian-national-tr/>

The **Office of Pediatric Surgical Evaluation and Innovation** is extremely proud to recognize the success of UBC Surgery trainees in the **2013-2014 Trainee Clinical Investigator Seed grants competition**. These awards are provided by the Innovations in Acute Care and Technologies Cluster at the Child and Family Research, and provide seed funds for research projects engaged in by trainees in association with a faculty member mentor.

Trainee	Faculty Mentor	Project Name
Dr. Brent Chang, ENT Resident	Neil Chadha	Sialendoscopy for treatment of juvenile recurrent parotitis
Mr. Nathan O'Hara, Master of Health Administration Student	Doug Courtemanche	Improving the Quality and Safety of International Child Health through Technology
Dr. Jennifer Stanger, Pediatric Surgery Fellow	Geoffrey Blair	Access to Care and outcomes in pediatric appendicitis in British Columbia
Dr. Peter Woerdeman, Pediatric Neurosurgery Fellow	Doug Cochrane	Craniofacial self-image and wellbeing after non-syndromic, single suture craniosynostosis treatment in infancy: a long-term outcome study
Dr. Claudia Malic, Pediatric Plastic Surgery Fellow	Cynthia Verchere	Retrospective Review of Incidence of Pharyngoplasty After Cleft Palate Repair



Damian J. Duffy, Executive Director of the Office of Pediatric Surgical Evaluation and Innovation, is pleased to announce that UBC President Stephen Toope and the UBC Alma Mater Society (AMS) has awarded him and his team an **AMS Innovative Projects Team Grant in support of "Developing Career Planning and Networking Opportunities for Undergraduate and Medical Students"**. Mr. Duffy acknowledges his faculty and student colleagues below who helped to author the proposal.

Dr. Geoffrey Blair, Chair, Surgery Undergraduate Committee, UBC Faculty of Medicine

Mr. Eric Carreras, Student, UBC Faculty of Science

Mr. Jordan Cheng, Student, UBC Faculty of Medicine

Dr. Norbert Froese, Head, Department of Pediatric Anesthesia, BC Children's Hospital

Dr. Erik Skarsgard, Head, Department of Pediatric Surgery, BC Children's Hospital

Ms. Jessica Holland, Student, UBC Faculty of Medicine

Ms. Diana Song, Student, UBC Faculty of Medicine

Mr. Jake Hiebert, Student, UBC Faculty of Medicine

Mr. Michael Stein, Student, UBC Faculty of Medicine

Ms. Vivian Leung, Student, UBC Faculty of Medicine

Ms. Mehta, Student, UBC Faculty of Medicine

Ms. Kitt Turney, Student, UBC Faculty of Medicine

Ms. Navraj Chima, Student, UBC Faculty of Medicine



Congratulations to **Dr. Robert Olson, Associate Professor, Division of Radiation Oncology and Developmental Radiotherapeutics** at the BC Cancer Agency in Prince George and to **Randi Woodbeck** (pictured) a first year medical student in the Northern Medical Program. Randi has been awarded a CIHR Health Professional Student Award to work on a project this summer with Dr Olson titled: "Exploring bottlenecks in the diagnostic and treatment pathway for lung cancer patients in northern British Columbia."



Congratulations to **Dr. Bernard Lee** (pictured) a Clinical Research Fellow with **Dr. Winkle Kwan** of the **Division of Radiation Oncology and Developmental Radiotherapeutics** at the BC Cancer Agency-Fraser Valley Centre for being awarded an ACURA grant from the Canadian Association for Radiation Oncology. The funding will support the COMPASS project: The Comprehensive Prostate Cancer Assessment on Sexual Health for Men-Who-Have-Sex-with-Men.



Dr. Neil Chadha (Otolaryngology) has received several grants to support some important, randomized control trials (RCT). From the Children's Miracle Network Telethon Projects Competition, Dr. Chadra has been funded to run a RCT investigating proton pump inhibitor therapy for laryngomalacia (floppy larynx) in infants. Dr. Chadra has also received funding from the American Association of Orthodontics and the UBC Faculty of Dentistry for a RCT investigating tonsillectomy/adenoidectomy versus maxillary expansion in pediatric obstructive sleep apnea.



Dr. Megan Levings (General Surgery) was invited to give a plenary lecture at the 100th Annual Meeting of the American Association of Immunology (AAI). Other plenary speakers were the Nobel Laureate David Baltimore and William Paul (your Immunology textbook was probably edited by him). Three students from Dr. Levings lab, **Jonathan Han, Kate MacDonald** and **Adele Wang**, also won travel awards to attend the meeting....which was held in Hawaii. Jonathan has also won a scholarship to attend the National CIHR Student Summer Symposium, and the International Congress of Immunology in Milan later this year.



Bryan Tennant, a PhD student with **Dr. Brad Hoffman (General Surgery)** has won scholarships from both the Canadian Diabetes Association and the Childrens and Families Research Institute for his work studying the transcription factors regulating pancreas development. These studies will give insight into producing replacement insulin producing beta cells for people with diabetes.



Dr. Jan Ehses (General Surgery) has received a Canadian Diabetes Association Operating Grant on "Regulation of alpha cell function by gp130 receptor signalling in type 2 diabetes". Pancreatic alpha cell dysfunction leading to elevated glucagon levels contributes to high blood sugar in type 2 diabetes. IL-6 family cytokines are increased in islets in both human type 2 diabetes and rodent models of this disease. Dr. Ehses' lab will investigate the role of these cytokines in alpha cell dysfunction.



Dr. Brad Hoffman (General Surgery) has won a Canadian Diabetes Association Scholar Award. Dr. Hoffman's lab studies the development of pancreatic beta cells in order to gain insight into increasing the amount of functional beta-cell mass for treating diabetic patients. Their research focuses on studying the interplay of transcription factors and epigenetics to understand how beta-cells develop mature and respond to immune attack. Their studies may reveal novel therapeutic targets to treat T1D, or contribute to the improvement of strategies to generate glucose-responsive, insulin-secreting cells for transplant in patients with T1D.



Dr. Jan Ehses (General Surgery) has received a CIHR grant to study the contribution of macrophages to islet inflammation and beta cell dysfunction in type 2 diabetes. This grant studies how macrophages can be converted to beneficial healing and tissue regenerating macrophages with the goal of using these cells to treat islet inflammation and type 2 diabetes.



Dr Reza Jalili, a postdoctoral research fellow with **Dr. Garth Warnock (General Surgery)** and **Dr. Aziz Ghahary (Plastic Surgery)**, has received a Michael Smith Foundation for Health Research (MSFHR) post-doctoral fellowship award for his work developing novel cell-based therapies for treatment of type 1 diabetes. In this project, Dr. Jalili wants to stop autoimmune destruction of insulin producing cells via injection of special type of cells that can train the immune system to become more tolerance toward beta cells. This year, only 30 MSFHR fellowships were awarded out of more than 200 applicants.



Dr. Charles H. Scudamore (General Surgery) has been appointed to the Order of British Columbia. The Order of British Columbia recognizes people who have served with the greatest distinction and excelled in any field of endeavour benefiting the people of the Province or elsewhere. The Order represents the highest form of recognition the Province can extend to its citizens.

The following is the award citation from <http://www.orderofbc.gov.bc.ca/>

Charles Scudamore is one of British Columbia's foremost physicians, whose outstanding work is extending the lives of British Columbians diagnosed with serious cancers while working toward the day when there is a cure. A leading surgical expert in liver transplantation, hepatobiliary oncology and trauma, Dr. Scudamore is staff surgeon at Vancouver General Hospital and B.C. Children's Hospital, surgical director of the B.C. Liver Transplant Program, and developed Hepatobiliary and Pancreatic Surgery at the University of British Columbia. In addition, Dr. Scudamore is the incoming president of the North Pacific Surgical Association. He is also a tremendous researcher, teacher and caring physician. Dr. Scudamore is an expert on the early recognition of pancreatic cancer as well as advanced colorectal metastases to the liver. He has led efforts to increase the number of liver transplants performed in British Columbia. In 2012, there were 65 transplants, up from the then-record 2011 total of 56. Each of these transplants marks a new beginning of a patient's life.

Dr. Scudamore's research - including the creation and support of the British Columbia Pancreatic Research Network - and other efforts to improve outcomes for patients with pancreatic cancer offers hope to the approximately 380 new cases diagnosed each year in British Columbia.

Working above and beyond the call of duty, Dr. Scudamore is helping patients live longer and more productive lives. In recognition of his outstanding contributions and service to fellow citizens, he was a recent recipient of the Queen Elizabeth II Diamond Jubilee Medal.



Dr. Geoff Blair's (Pediatric General Surgery) work on identifying unnecessary tests was discussed in an article in the Vancouver Sun.

Canada's doctors will begin compiling lists of questionable or worthless tests and procedures that offer little benefit, and possible harm, in a move some doctors say could lead to a "sea change" in patient care.



The National Cancer Institute, a branch of the U. S. National Institutes of Health, has awarded an \$11.3 million, five-year grant to the Pacific Northwest Prostate Cancer SPORE (SPORE is short for Specialized Programs of Research Excellence), group which consists of investigators from the Vancouver Prostate Cancer Centre of eExcellence, and from the Fred Hutchinson Research Center in Seattle. This SPORE group aims to unravel the molecular mechanisms underlying the development and progression of prostate cancer and to develop new therapeutic strategies that use precision-medicine approaches to improve survival and reduce treatment-related side effects.

Dr. Christopher Ong (General Surgery) and Dr. Martin Gleave (Urological Sciences) lead 1 of the 5 projects in this group grant. Their project **Targeting *SEMA3C* in castration-resistant prostate cancer** is focused on defining and targeting pathways that drive advanced prostate cancer. The goal is to define the mechanisms of a gene called *SEMA3C* in promoting resistance to androgen-deprivation therapy in an effort to develop and test a new therapy that targets the *SEMA3C* pathway in a preclinical model and, ultimately, in a phase 1 human clinical trial. Their project ranked most highly of the 5 projects and was given a score of 1.0.....which is a perfect score in the NIH system.

A History of WB & MH Chung Lectureship

In 1995 Madeline and Wally Chung made a generous donation to the Department of Surgery at the University of British Columbia.

The purpose of the donation was to support an annual UBC Department of Surgery research day and invite the W.B. & M.H. Chung Lecturer to present new academic work as well as judge academic productivity, not only by the Residents but also by the Faculty.

The format was directed toward the new work developed by the Residents, Fellows, Basic Scientists and Faculty. Each paper was 10 minutes in duration and a five minute discussion period followed for each paper.

The visiting professor presented original research as part of the day as well as judged the clinical and basic science presentations.

The first visiting professor was Lloyd D. MacLean, MD, FRCSC, FACS who was head of the Department of Surgery at McGill University as well as President of the American College of Surgeons.

Each of the Research Days has been attended by Dr. Chung who has been actively involved in the Department for almost fifty years.

Dr. Chung was heartened by the active interests of the Residents as well as Basic Scientists and Faculty in exchanging information at the Research Day. The Department is grateful for this wonderful legacy that Madeline and Wally Chung have left for the Department.

1995	Lloyd MacLean, McGill University
1996	John Duff, University of Western Ontario <i>"Multisystem organ failure: manifestations and mediators"</i>
1997	K. Wayne Johnston, University of Toronto <i>"Issues in the management of abdominal aortic aneurysms in a rapidly changing health care environment"</i>
1998	Charles H. Tator, Professor and Chair, Division of Neurosurgery, The Toronto Hospital <i>"The breadth of surgical research in the 1990's"</i>
1999	Garth Warnock, Chief General Surgery, University of Alberta Hospitals Director, Division of Surgical Research, University of Alberta <i>"Progress in transplantation of insulin-secreting tissues for diabetes mellitus"</i>
2000	Paul Walker, Vice President, Toronto General Hospital Professor of Surgery and Laboratory Medicine, Pathobiology, University of Toronto <i>"The continuing challenge of sepsis"</i>
2001	James C. Thompson, Ashbel Smith Professor of Surgery, University of Texas Medical Branch <i>"Endocrine tumors of the pancreas"</i>
2002	Richard J. Finley, Professor, Department of Surgery Head, Division of Thoracic Surgery, University of British Columbia <i>"Future of image guided minimally invasive thoracic surgery"</i>
2003	Douglas W. Wilmore, Frank Sawyer Professor of Surgery, Department of Surgery Brigham and Women's Hospital, Boston, Massachusetts <i>"The pathophysiology and treatment of intestinal failure"</i>
2004	John Wong, Chair of Surgery & Head, Department of Surgery University of Hong Kong Medical Centre, Queen Mary Hospital, Hong Kong <i>"Complications of esophagectomy: confess and remember"</i>
2005	Richard K. Reznick, R.S. McLaughlin, Professor and Chair, University of Toronto Department of Surgery, Banting Institute, Toronto, Ontario <i>"Surgical training in 35 hours per week: laudable or lunacy?"</i>
2006	James T. Rutka, Janes Visiting Professor in Surgery Dan Family Chair in Neurosurgery, Professor and Chairman, Division of Neurosurgery, University of Toronto <i>"Astrocytoma invasiveness: molecular mechanisms form the leading edge"</i>
2007	Markus W. Büchler, Professor of Surgery, Division of General Surgery Chairman Surgical Unit, University of Heidelberg <i>"Evidence based pancreatic surgery"</i>
2008	Thomas M. Krummel, Emile Holman Professor and Chair Stanford University School of Medicine, Department of Surgery Susan B. Ford Surgeon in Chief, Lucile Packard Children's Hospital, Stanford, CA <i>"From Blood and Guts to Bits, Bytes and Beyond-- Upgrading the Surgical Apprentice Model"</i>
2009	Andrea L. Pusic, Assistant Attending Surgeon, Plastic and Reconstructive Surgery Memorial Sloan-Kettering Cancer Center, New York <i>"Measuring patient reported outcomes in surgery"</i>
2010	Yvan Douville, Chief, Department of Surgery, University of Laval <i>"Evolution of Stentgraft for Treatment of Abdominal Aortic Aneurysms"</i>
2011	Gerald Fried, Chair, Department of Surgery, McGill University <i>"Teaching Billy how to operate: can we do better?"</i>
2012	Haile Debas, Executive Director of UCSF Global Health Sciences (GHS); former Dean of the UCSF School of Medicine (1993-2003); former Chair, UCSF Department of Surgery <i>"Precious Times"</i>