The 23rd Annual

WB & MH Chung

Lectureship and Research Day
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*The Surgical Times was formerly the newsletter of the UBC Department of Surgery produced by two distinguished emeriti professors: Dr. Phil Ashmore and Dr. John MacFarlane. With the advent of electronic communications, the Surgical Times is now only printed in paper form once a year for Chung Research Day.*
Learning Objectives

This event is an Accredited Group Learning Activity eligible for up to 6 Section 1 credits as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada. This program has been reviewed and approved by UBC Division of Continuing Professional Development. Each physician should claim only those credits he/she actually spent in the activity.

1. To describe and evaluate the clinical, education and basic science research being conducted in the Department of Surgery.
2. To discover new and innovative research techniques.
3. To participate in the collaborative research environment within the Department of Surgery.
## Research Day Schedule

### MORNING SESSION

*8 minute paper with 2 minute discussion*

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker/Title</th>
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<tbody>
<tr>
<td>0800</td>
<td>Dr. Gary Redekop, Head, Department of Surgery: Chung Research Day Welcome</td>
</tr>
<tr>
<td>0805</td>
<td>Dr. Dean Percy, General Surgery: Mental Toughness in Surgeons: How do we measure up?</td>
</tr>
<tr>
<td>0815</td>
<td>Dr. Mohsen Akbari, Neurosurgery: A Pressure Sensor for Intracranial Pressure Monitoring for Management of Hydrocephalus</td>
</tr>
<tr>
<td>0825</td>
<td>Dr. Elaine McKevitt, Plastic Surgery: ‘Swing Rooms’ – an innovative resource utilization model to improve combined care and access to immediate breast reconstruction</td>
</tr>
<tr>
<td>0845</td>
<td>Dr. Brian Westerberg, Medical Director, Branch for International Surgical Care: Welcome to Dr. Wendy Lai</td>
</tr>
<tr>
<td>0845</td>
<td>CHUNG LECTURE 1 - Dr. Wendy Lai</td>
</tr>
<tr>
<td>0945</td>
<td>Dr. Joseph Margolick, General Surgery: The foundations of a bilateral academic exchange between a high and a middle income country - the UBC-HCC Polanco partnership</td>
</tr>
<tr>
<td>0955</td>
<td>Dr. Annie Lalonde, General Surgery: The Establishment of a Trauma Registry in Gondar, Ethiopia</td>
</tr>
<tr>
<td>1005</td>
<td>Dr. Kimberly Luu, Otolaryngology: Assessing the impact of a longitudinal collaboration on a developing residency program in low resource setting</td>
</tr>
<tr>
<td>1015</td>
<td>Dr. Nicole Jedrzejko, General Surgery: A Systematic Review on Sustainability Criteria in Global Surgery</td>
</tr>
<tr>
<td>1025</td>
<td>Dr. Nadine Caron, General Surgery: The Northern Biobank Initiative: Dialogue to permit dialogue...lessons learned in establishing a First Nations Biobank</td>
</tr>
<tr>
<td>1035</td>
<td>REFRESHMENT BREAK</td>
</tr>
<tr>
<td>1050</td>
<td>Dr. William Jia, Neurosurgery: A novel oncolytic HSV-1 vector for cancer immunotherapy</td>
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<tr>
<td>1100</td>
<td>Dr. Katrina Duncan, General Surgery: Usability and Feasibility of a Mobile Electronic Trauma Health Platform</td>
</tr>
<tr>
<td>1110</td>
<td>Dr. Thilo Speckman, General Surgery: NPSA4 optimizes metabolism during excitation of pancreatic B-cells by suppressing HIF1α signalling</td>
</tr>
<tr>
<td>1130</td>
<td>Dr. Heather Denroche, General Surgery: Interactions between IAPP and innate immunity in islet amyloid-induced diabetes</td>
</tr>
<tr>
<td>1140</td>
<td>Dr. Amir Pourghadiri, Plastic Surgery: The Use of a Liquid Skin Substitute Improves the Healing Outcome of Full-Thickness Wounds in a Porcine Model</td>
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<tr>
<td>1150</td>
<td>Dr. Graeme Hintz, Pediatric Surgery: Stapled versus Hand-Sewn Pediatric Intestinal Anastomoses: A Retrospective Cohort Study</td>
</tr>
<tr>
<td>1200</td>
<td>Dr. Aria Shokoohi, Radiation Oncology: A Population-based Review of Salvage Surgery, Radioactive Iodine, External Beam Radiation and Systemic Therapy for Management of Recurrent Differentiated Thyroid Cancer</td>
</tr>
<tr>
<td>1210</td>
<td>Dr. Stahs Pripotnev, Plastic Surgery: The Chevron Flap – A Case Series Demonstrating a Novel Flap Design and Applications</td>
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### SIMULTANEOUS SESSIONS & LUNCH
## AFTERNOON SESSION

*8 minute paper with 2 minute discussion*

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1320</td>
<td>Dr. Evie Landry</td>
<td>Otolaryngology</td>
<td>The Use of Video Glasses in Pediatric Surgical Education</td>
</tr>
<tr>
<td>1330</td>
<td>Andrew Thamboo</td>
<td>Otolaryngology</td>
<td>5-Year Outcomes of Salvage Endoscopic Nasopharyngectomy for Nasopharyngeal Carcinoma</td>
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<tr>
<td>1340</td>
<td>Dr. Kimberly Luu</td>
<td>Otolaryngology</td>
<td>Virtual Surgery &amp; Stereolithography for Complex Head &amp; Neck Reconstruction</td>
</tr>
<tr>
<td>1350</td>
<td>Dr. Jordan Tran</td>
<td>Radiation Oncology</td>
<td>Adolescent and Young Adult Central Nervous System Tumor Survivors: An Assessment of the Documentation of Late-Effects Risks and Screening Recommendations</td>
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</table>

### CHUNG LECTURE 2 - Dr. Michael Tymianski

<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>1400</td>
<td>Dr. Gary Yang</td>
<td>Vascular Surgery</td>
<td>Utilization of spinal drain and intraoperative neurophysiologic monitoring in thoracic endovascular aortic repair</td>
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<tr>
<td>1500</td>
<td>Dr. Tyler Omeis</td>
<td>Plastic Surgery</td>
<td>A 40-Year Review of Demographics and Clinical Outcomes of Adult Burn Patients Admitted to a Single Provincial Burn Centre</td>
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<tr>
<td>1510</td>
<td>Dr. Gautam Sarwal</td>
<td>Vascular Surgery</td>
<td>Technique and complications of extended iliofemoral eversion endarterectomy for severe iliofemoral arterial disease</td>
</tr>
<tr>
<td>1520</td>
<td>Dr. Javier Ospina</td>
<td>Otolaryngology</td>
<td>Endoscopic Craniofacial Resection and Endoscopic Assisted Craniofacial Resection for locally advanced anterior skull base Tumors.</td>
</tr>
<tr>
<td>1530</td>
<td>Dr. Percy Edward</td>
<td>Cardiac Surgery</td>
<td>Using CT Angiograms to Predict Conversion to Sternotomy or Complicated Anastomosis in Patients Undergoing Robotically-Assisted Minimally Invasive Coronary Artery Bypass</td>
</tr>
</tbody>
</table>

### Evening Reception (RSVP required)

**Program**

6:00 pm - Cocktails
6:30 pm – Award Presentations
7:00 pm – Dinner

**Location**

The University Golf Club in the heart of the Pacific Spirit Park and the University Endowment Lands

*5185 University Blvd, Vancouver, BC V6T 1X5*
<table>
<thead>
<tr>
<th>#</th>
<th>Division</th>
<th>Submitting Author</th>
<th>Abstract Title</th>
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<tbody>
<tr>
<td>A01</td>
<td>Neurosurgery</td>
<td>Fatehi Hassanabad, Mostafa</td>
<td>Patient Outcomes After Treatment of PICA Aneurysms</td>
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<tr>
<td>A02</td>
<td>Neurosurgery</td>
<td>Makarenko, Serge</td>
<td>A Novel Scale for Describing Visual Outcomes in Patients Following Resection of Lesions Affecting the Optic Apparatus – Unified Visual Function Scale</td>
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<td>A03</td>
<td>General Surgery</td>
<td>Margolick, Joseph Frank</td>
<td>Systematic Review and Meta-analysis of Unplanned Reoperations, Emergency Department Visits and Hospital Readmission After Thyroidectomy</td>
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<tr>
<td>A04</td>
<td>Neurosurgery</td>
<td>Charlotte Dandurand</td>
<td>Adult craniopharyngioma: case series, systematic review and meta-analysis</td>
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<tr>
<td>A05</td>
<td>Otolaryngology</td>
<td>Gheriani, Heitham</td>
<td>Frontal Ostium Grade (FOG) - A NEW CT Grading system for a safe surgical approach to the frontal sinus</td>
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<td>A06</td>
<td>General Surgery</td>
<td>Hiebert, Jake Daniel</td>
<td>Dual-energy Computed Tomography Should Be The First Line Preoperative Localization Study For Individuals Undergoing Parathyroidectomy For Treatment of Primary Hyperparathyroidism</td>
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<td>A07</td>
<td>General Surgery</td>
<td>Oosthuizen, Jean LF</td>
<td>Papillary Features In Thyroid Nodules Diagnosed As Atypia of Undetermined Significance or Follicular Lesion of Undetermined Significance Increases Cancer Risk And Should Influence Treatment</td>
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<td>A08</td>
<td>Neurosurgery</td>
<td>Akbari, Mohsen</td>
<td>Temozolomide-loaded polymeric microparticles for treatment of glioblastoma multiforme</td>
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<td>A09</td>
<td>Otolaryngology</td>
<td>Jabalee, James Patrick</td>
<td>Analyzing the nuclear phenotype of histologically normal tumor-adjacent epithelium in patients with HPV-positive oropharyngeal cancer</td>
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<tr>
<td>A10</td>
<td>Otolaryngology</td>
<td>Butskiy, Oleksandr</td>
<td>Customized computer optimization of flap design for circumferential pharyngoesophageal reconstruction: a case series.</td>
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<td>A11</td>
<td>General Surgery</td>
<td>Webb, Mitchell Allan</td>
<td>Open Abdomen in Liver Transplantation</td>
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<tr>
<td>A12</td>
<td>Plastic Surgery</td>
<td>Mankowski, Peter James</td>
<td>Ensuring success after match: perceptions of attributes valued in plastic surgery residents</td>
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<td>A13</td>
<td>Cardiac Surgery</td>
<td>Hong, Jonathan</td>
<td>Staphylococcus aureus prevention strategies in cardiac surgery: a cost-effectiveness analysis</td>
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<td>A14</td>
<td>Otolaryngology</td>
<td>Tong, Jeffery</td>
<td>Incorporating patient choice and participation in the decision-making process of selecting a cochlear implant model</td>
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<tr>
<td>A15</td>
<td>Pediatric Surgery</td>
<td>Tong, Jeffery</td>
<td>Using medical student focus groups to supplement faculty evaluative feedback during clerkship</td>
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</table>
# Simultaneous Session B – Chair Dr. Hannah Carolan
Paetzold Lecture Theatre, 12:20 – 1:20 pm

*2.5 minute paper with 0.5 minute discussion*

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<th>#</th>
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<tr>
<td>801</td>
<td>Otolaryngology</td>
<td>Pauwels, Julie Francine</td>
<td>Spontaneous resolution of ear lidding in newborns</td>
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<td>802</td>
<td>Otolaryngology</td>
<td>Chadha, Neil K</td>
<td>Increased Injury and subsequent health care utilization in a population based sample of children with hearing loss in the United States</td>
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<td>803</td>
<td>Cardiac Surgery</td>
<td>Cook, Richard</td>
<td>Complete Revascularization May Not Be Necessary In Patients Undergoing Robotically-Assisted MIDCAB</td>
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<tr>
<td>804</td>
<td>Neurosurgery</td>
<td>Ayling, Oliver G.S.</td>
<td>Suboccipital Decompressive Craniectomy for Cerebellar Infarction: A Systematic Review and Meta-Analysis</td>
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<tr>
<td>805</td>
<td>Neurosurgery</td>
<td>Ayling, Oliver G.S.</td>
<td>Anemia after aneurysmal subarachnoid hemorrhage is associated with poor long-term outcome and death</td>
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<td>806</td>
<td>General Surgery</td>
<td>DeGirolamo, Kristin</td>
<td>A Day in the Life of Emergency General Surgery in Canada: A Multicentre Observational Study</td>
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<td>807</td>
<td>General Surgery</td>
<td>Zou, Yuanjie</td>
<td>Autophagy and Lysosomal Function Protect Pancreatic β-Cells under Hypoxic Stress</td>
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<td>808</td>
<td>Cardiac Surgery</td>
<td>Yang, Cathevine</td>
<td>Incidence of Upper Extremity Deep Venous Thrombosis Following Laser Assisted Lead Extraction of Pacemaker and Implantable Cardioverter Defibrillator Leads</td>
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<td>809</td>
<td>Otolaryngology</td>
<td>Javer, Amin R.</td>
<td>A Prospective Randomized Controlled Trial Assessing Saline Nasal Irrigation Administration Methods Comparing Use of Multimedia Education Platforms and Offline Instruction Sheets</td>
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<td>810</td>
<td>Otolaryngology</td>
<td>Newton, Ethan</td>
<td>The impact of surgical wait times on patient-reported outcomes in sinus surgery for chronic rhinosinusitis</td>
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<td>811</td>
<td>General Surgery</td>
<td>Johar, Jasper</td>
<td>Older Differentiated Thyroid Cancer Patients Exhibit Increased Cancer Invasiveness And Nodal Metastases: A Possible Explanation For Their Worse Prognosis</td>
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<td>812</td>
<td>General Surgery</td>
<td>Ghuman, Amandeep</td>
<td>Urinary Retention In Early Foley Catheter Removal After Colorectal Surgery</td>
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<td>813</td>
<td>Otolaryngology</td>
<td>Tellez, Paula</td>
<td>Why patients referred for Cochlear Implant Assessment ultimately do not received a Cochlear Implant: Who said not to Whom?</td>
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<td>814</td>
<td>Otolaryngology</td>
<td>Amenyogbe, Andrew</td>
<td>Noise in the operating rooms of BC Children’s Hospital</td>
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<td>815</td>
<td>General Surgery</td>
<td>Lustig, Daniel Ben</td>
<td>Is Microductectomy Necessary To Diagnose Breast Cancer?</td>
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<tr>
<td>C1</td>
<td>Plastic Surgery</td>
<td>Van Slyke, Aaron Christopher</td>
<td>Breast implant longevity and reasons for explantation: a 13-year review</td>
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<td>C2</td>
<td>Pediatric Surgery</td>
<td>McCutcheon, Victoria</td>
<td>Paediatric Elbow Fractures from a Child’s Viewpoint: A mixed-methods study</td>
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<td>C3</td>
<td>Plastic Surgery</td>
<td>Akbari, Mohsen</td>
<td>Advanced Multifunctional Hydrogel-Based Dressing for Wound Monitoring</td>
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<tr>
<td>C4</td>
<td>Radiation Oncology</td>
<td>Chan, Matthew</td>
<td>Correlating pre-treatment white matter hyperintensity on magnetic resonance imaging and cognitive function after volumetric radiosurgery and whole brainradiotherapy</td>
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<td>C5</td>
<td>Plastic Surgery</td>
<td>Leung, Leslie</td>
<td>A Cross-Sectional Analysis of the Cleft Palate-Craniofacial Waitlist</td>
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<td>C6</td>
<td>Radiation Oncology</td>
<td>Murchison, Sonja Catherine</td>
<td>Subventricular Zone Dose and Outcome In A Large Cohort Of Glioblastoma Multiforme Treated With Surgery and Concurrent Chemoradiotherapy Between 2006-2012</td>
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<td>C7</td>
<td>Otolaryngology</td>
<td>Amanian, Ameen</td>
<td>Mastoid Pressure Dressing Usage Following Cochlear Implant Surgery - Challenging the Practice Patterns Amongst Canadian Pediatric Otolaryngologists</td>
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<td>C8</td>
<td>Plastic Surgery</td>
<td>Nickel, Kevin</td>
<td>Tissue Expansion for Equinovarus Deformity: A 16-year Review</td>
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<td>C9</td>
<td>Otolaryngology</td>
<td>Gurberg , Joshua</td>
<td>Safety of Long Term Budesonide-Impregnated Topical Nasal Saline Irrigation for the Treatment of Chronic Rhinosinusitis</td>
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<td>C10</td>
<td>Otolaryngology</td>
<td>Gurberg , Joshua</td>
<td>The Efficacy of Treatment for Idiopathic Sudden Sensorineural Hearing Loss – The Vancouver General Hospital Experience</td>
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<tr>
<td>C11</td>
<td>General Surgery</td>
<td>MacDonald, Katherine Nicole</td>
<td>Effect of cytokines on thymus-derived regulatory T cell expansion</td>
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<td>C12</td>
<td>Radiation Oncology</td>
<td>Chang, Kimberley Lauren</td>
<td>Questioning the Quality of Online Thyroid Cancer Information</td>
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<td>C13</td>
<td>Pediatric Surgery</td>
<td>Ma, Vivian H.Y.</td>
<td>Dressed for success? Silver impregnated nanocrystalline dressing for initial treatment of giant omphalocoele</td>
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<td>C14</td>
<td>Plastic Surgery</td>
<td>Foggin, Hannah Hope</td>
<td>Evaluation of the viability and function of adipose-derived stem cells within a bioengineered liquid skin substitute</td>
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<td>C15</td>
<td>Plastic Surgery</td>
<td>Demsey, Daniel</td>
<td>Predictive Factors and Outcomes in Major Burn Patients with Renal Injury</td>
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<td>C16</td>
<td>Plastic Surgery</td>
<td>Zawadiuk, Luke</td>
<td>Recurrent Breast CSF Pseudocyst and Updated Literature Review</td>
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<tr>
<td>C17</td>
<td>Otolaryngology</td>
<td>Raza, Syed Shuja</td>
<td>Selective Secretion of miR-605-5p via Extracellular Vesicles Plays a Complex Role in Oral Squamous Cell Carcinoma</td>
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<td>C18</td>
<td>Otolaryngology</td>
<td>Chen , Rachel (Hao Hang)</td>
<td>MicroRNA Expression Profile in Sensorineural Hearing Loss</td>
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<td>C19</td>
<td>Plastic Surgery</td>
<td>Forbes, Diana</td>
<td>Novel Therapy for Complex Wounds using a Dermal Gel Matrix with Adipose Derived Stem Cells</td>
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<td>Otolaryngology</td>
<td>Wijesinghe, Printhra</td>
<td>Are inner ear cell characteristics of porcine derived inner ear cells persistent?</td>
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<td>C21</td>
<td>Plastic Surgery</td>
<td>Roller, Janine</td>
<td>A review of the characteristics of validated QOL PROMS in pediatric plastic surgery</td>
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<td>C22</td>
<td>Plastic Surgery</td>
<td>Alnojeidi, Hatem Humod</td>
<td>Hematopoietic Cell-derived Multipotent Stem Cells Are Major Contributors to Dermal Wound Healing</td>
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<td>C23</td>
<td>Otolaryngology</td>
<td>Butskiy, Oleksandr</td>
<td>Retrograde medial dissection of the recurrent laryngeal nerve in thyroid surgery: technique presentation and a review of 342 consecutive surgeries.</td>
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<td>C24</td>
<td>Otolaryngology</td>
<td>Butskiy, Oleksandr</td>
<td>Gastric pull up as a primary reconstructive option for circumferential pharyngoesophageal junction defects: morbidity, mortality, and functional outcomes in a cohort of 48 patients.</td>
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<td>C25</td>
<td>Otolaryngology</td>
<td>Butskiy, Oleksandr</td>
<td>Nasal septum squamous cell carcinoma: the first classification system and a case series</td>
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<td>C26</td>
<td>Otolaryngology</td>
<td>Javer, Amin R.</td>
<td>Effect of Endoscopic Sinus Surgery on Clinical Outcomes in Cystic Fibrosis</td>
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<td>C27</td>
<td>Otolaryngology</td>
<td>Javer, Amin R.</td>
<td>Comparison of Ambulatory Surgical Centers to Hospital Based Facilities in Outcomes of Endoscopic Sinus Surgery</td>
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<td>Pediatric Surgery</td>
<td>Ng, Michelle</td>
<td>Hand Hygiene Education Campaign at Soroti Regional Referral Hospital, Uganda</td>
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<td>Vascular Surgery</td>
<td>Arsenault, Kyle Adam</td>
<td>Venous arterialization for non-reconstructible lower extremity arterial disease - A multi-centre case series</td>
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<td>C30</td>
<td>Radiation Oncology</td>
<td>Shokoohi, Aria</td>
<td>Management of Differentiated Thyroid Cancer In Accordance With the American Thyroid Association Guidelines: Impact on Patient Disease Free and Overall Survival Outcomes</td>
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<tr>
<td>C31</td>
<td>Vascular Surgery</td>
<td>Hamidizadeh, Ramin</td>
<td>Influence of arterial and venous diameters on autogenous arteriovenous access patency</td>
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<td>C32</td>
<td>Otolaryngology</td>
<td>Parhar, Harman Singh</td>
<td>Patient Refusal of Cancer-Directed Surgery Contributes to Disparities in Head &amp; Neck Squamous Cell Carcinoma Outcomes</td>
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<td>C33</td>
<td>Otolaryngology</td>
<td>Parhar, Harman Singh</td>
<td>60-Day Readmission following Transoral Robotic Surgery for Oropharyngeal Squamous Cell Carcinoma: A Nationwide Analysis</td>
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<td>C34</td>
<td>General Surgery</td>
<td>Hui, Queenie</td>
<td>The Role of Islet Resident Macrophages and β-cells in Amyloid-Induced IL-1β Production in Human Islets: Implications for Clinical Islet Transplantation</td>
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<td>C36</td>
<td>Otolaryngology</td>
<td>Ospina, Javier</td>
<td>Using the EQ-5D to calculate the cost-effectiveness of Endoscopic Sinus Surgery for the treatment of Chronic Rhinosinusitis in Canada</td>
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<tr>
<td>C38</td>
<td>Otolaryngology</td>
<td>Javer, Amin R.</td>
<td>Sinonasal Inverted Papilloma Recurrence Rates after Endoscopic Surgery: A Retrospective Review – The St. Paul’s Sinus Centre Experience</td>
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<tr>
<td>C39</td>
<td>Pediatric Surgery</td>
<td>Chiu, Huai-Hsuan Clare</td>
<td>Teacher-Learner Contract (TLC): an objectives-based checklist for surgical shadowing</td>
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The WB & MH Chung Research Day provides an opportunity for our large and diverse Department of Surgery to highlight the wide range of basic and clinical research conducted by our faculty and trainees. The program includes topics ranging from pure basic science to translational research, education, and clinical outcome studies. We had a record number of abstract submissions, reflecting a wide range of research in the UBC Department of Surgery, from basic and translation science to clinical and educational studies.

This year we will have two visiting Chung Lecturers - one is the traditional academic surgeon phenotype, and one completely different to raise the profile of global health and global surgery in general, which is one of the major interests and activities in the UBC Faculty of Medicine and the Department of Surgery.

Dr. Michael Tymianski, Head of UHN's Division of Neurosurgery and Senior Scientist at the Krembil Research Institute, University of Toronto, is a world-renowned neurosurgeon and neuroscientist. He holds a Tier 1 Canada Research Chair in Translational Stroke Research and was recently inducted into the Order of Canada. Dr. Tymianski has dedicated his research to understanding the molecular mechanisms underlying stroke and possible therapies for cerebral protection.

Dr. Wendy Lai, President of Mèdecins Sans Frontières (Doctors Without Borders) Canada
Dr. Lai is a specialist in Emergency Medicine at Humber River Hospital in Toronto. She has worked in remote communities of the Canadian North delivering medical care to First Nations and with MSF in several international missions. For Dr. Lai, assisting disadvantaged populations has been a natural extension of her passion for medicine and commitment to social justice.

I would like to acknowledge the energy and creativity that the event organizers have put into making Chung Day a success. Dr. Alice Mui and her scientific program committee have carefully reviewed the submissions and selected a cross section of high quality projects representative of the many avenues of research in the Department of Surgery, which will be presented in a variety of formats. Dr. Mui has also worked along with Susan Nye, my Executive Assistant, and Bethany Saunders, our Director of Administration, to look after the planning and logistics for the day. My sincere thanks to all of you!

I would also like to acknowledge the outstanding accomplishments of the many faculty, residents, fellows, and graduate students in the Department of Surgery, and sincerely hope that you will share with me a deep satisfaction that comes from noting our Department’s many research activities.

Gary Redekop
Head, Department of Surgery
October 2017
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 Department 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 and received his M.D. in 1953. Following internship and surgical residency training at VGH and UBC, Dr. Chung was appointed to the Department 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 Department 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 Department 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 she 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. Dr. Madeline Chung’s is a busy grandmother of five grandchildren.
Dr. Michael Tymianski

Dr. Michael Tymianski is the Head of UHN’s Division of Neurosurgery and Senior Scientist at the Krembil Research Institute.

A world-renowned neurosurgeon and neuroscientist, Dr. Tymianski holds a Tier 1 Canada Research Chair in Translational Stroke Research and was recently inducted into the Order of Canada. He has received multiple academic awards, and funding from the National Institutes of Health, Canadian Institutes of Health Research, Heart and Stroke Foundation of Ontario and the Canadian Stroke Networks.

For the last two decades, Dr. Tymianski has dedicated his research to understanding the molecular mechanisms underlying stroke and possible therapies for cerebral protection. His efforts led to the discovery of the drug called NA-1 which has the potential to protect the brain from the effects of stroke. NA-1 is currently in Phase III clinical trials in humans.

Dr. Wendy Lai

Dr. Wendy Lai is the President of Médecins Sans Frontières (Doctors Without Borders) Canada.

Dr. Lai is a specialist in Emergency Medicine at Humber River Hospital in Toronto. She earned a biochemistry degree with great distinction from McGill University, a medical degree from the University of Western Ontario and studied Family Medicine at the University of Toronto. Dr. Lai has worked in remote communities of the Canadian North delivering medical care to First Nations.

Involved with MSF since 2006, Dr. Lai has worked in the Democratic Republic of the Congo as a medical doctor and as the medical team leader in a maternity hospital in Port-au-Prince, Haiti. She returned to work in post-earthquake Haiti and, most recently, served in the Central African Republic as the medical team leader for a secondary health care project. For Dr. Lai, assisting disadvantaged populations has been a natural extension of her passion for medicine and interest in social justice.
Background: Hydrocephalus is a disease of the brain, characterized by buildup of cerebrospinal fluid. To prevent brain damage due to increased pressure, a shunt is run from the patient’s brain to the abdomen, rerouting excess fluid to be safely absorbed. If this shunt is ever obstructed, the cerebrospinal fluid is unable to drain, and builds up in the brain, causing trauma. 

Objectives: The goal of this work was to develop an implantable pressure sensor, which can monitor the function of the hydrocephalus shunt and provide early warning of failure, allowing doctors to repair the system before any lasting damage occurs. Methods: We printed a strain sensor on a commercially available shunt to measure the deformations in the shunt body as a marker of pressure change. We performed finite element analysis to determine the best location for the sensor. We characterized the sensor and evaluated the ability of the sensor in detecting shunt blockage in the downstream. A Bluetooth circuit was integrated with this system to record the data and transfer it to an external device wirelessly. Results: Our work indicates that printing strain gauges on the surface of implantable shunts is a viable method to create pressure sensors, which could mitigate long term health effects of hydrocephalus. This technology has substantial potential and significant opportunity for more development and growth.

0825  Elaine McKevitt, Plastic Surgery
Title: ‘Swing Rooms’ – an innovative resource utilization model to improve combined care and access to immediate breast reconstruction

Background: Despite benefits in quality of life, patient satisfaction, overall healthcare costs and number of surgeries, historically fewer than 30 percent of patients undergo immediate breast reconstruction following mastectomy for breast cancer. A paucity of qualified oncologic and plastic surgeons coupled with inefficient use of operating (OR) resources presents challenges in offering immediate breast reconstruction in a timely manner. To address these challenges, a rapid access therapeutic mastectomy and immediate reconstruction (RATMIR) program was developed. This study evaluates RATMIR with regards to access to care and efficiency. Methods: All surgical breast cancer cases, including those requiring therapeutic mastectomy for breast cancer were prospectively collated in database form from July 2009 to 2015. In 2010-11 a ‘swing-room’ model was introduced; a full weekly RATMIR program commenced in 2012. The RATMIR swing-room model leverages 2 concurrently running ORs with the surgical oncologist and plastic surgeon moving between rooms to complete 2-4 combined mastectomy cases with immediate reconstruction, in addition to 1-2 independent cases each operative day. Additional dedicated non-swing rooms provide early warning of failure, allowing doctors to repair the system before any lasting damage occurs. Results: Our work indicates that printing strain gauges on the surface of implantable shunts is a viable method to create pressure sensors, which could mitigate long term health effects of hydrocephalus. This technology has substantial potential and significant opportunity for more development and growth.

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0955  Annie Lalonde, General Surgery
Title:  The Establishment of a Trauma Registry in Gondar, Ethiopia
Anne Lalonde1,2, Kristin DeGirolamo1, Deussi Yirdaw2, Meray Berhan2, Mekel Mengistu3, Mesker Yasins3, Richard Simons4.
1General Surgery, University of British Columbia, 2General Surgery, University of Gonder, 3General Surgery, Gonder University Hospital, 4Trauma Surgery, Vancouver General Hospital
Background: Trauma constitutes a major cause of morbidity and mortality worldwide, and its burden is highest in low- and middle-income countries (LMIC). However, access to epidemiological data is often limited by the lack of a structured gathering system known as a trauma registry. Through the collection of standardized data on trauma patients, it becomes possible to devise targeted injury prevention programs, to better allocate resources within a hospital or a province, and to support advocacy at various levels. A minimal trauma dataset had been deployed in Gonder previously. Unfortunately, data collection had not been sustained over the last few years. Given an ongoing interest in implementing the registry, another visit was planned. Objectives: The objective of this project was to re-establish the trauma registry in the Gonder University Hospital, to identify key players and interventions to ensure continuity as well as to characterize the trauma population in the Gonder area. Methods: A field visit was conducted in June 2017. Focus-group discussions were held with the key surgeons interested in participating in the development of the trauma registry and hospital trauma system. Information sessions were also held with the residents and interns, who were identified as the main data collectors. A statistician joined the team as an archivist to enter the data collected on paper at the bedside into a tablet-based application, creating a standardized trauma registry. Results: Data collection has been ongoing since the visit in June 2017, with a total of 418 patients currently in the trauma database. Some of the most significant interventions in ensuring continuity of collection were creating a data flow involving bedside data collection by the interns, and having access to an archivist with dedicated weekly time for data entry. Conclusion: Since the last visit, data collection has been sustained and reliable. The flow of information has been more clearly established, and the addition of a permanent archivist was a significant advance in the registry development. Further developments will include on-site observations by the local team to identify common issues leading to decreased data quality, implementation of solutions and tracking of impact using quality indicators within the registry.

1005  Kimberley Lus, Otolaryngology
Title:  Assessing the impact of a longitudinal collaboration on a developing residency program in low resource setting
Doreen Nakku, Kimberley Lus, Mack Cheney, Gig Odier, Brian Westerberg, Department of Otolaryngology, University of British Columbia
Background: The development of medical training programs in a low resource setting is a complex challenge. The objective of this paper is to examine the effectiveness of educational interventions provided through short international collaborations. Methods: A retrospective review is conducted of the educational programs delivered jointly by three North American Universities and Mbarara University in Uganda. Three years of pre and post intervention scores were assessed for five technical skills. Transfer of endoscopy and suturing skills to clinical practice was assessed by examining the number of procedures performed before and after the intervention. Qualitative data was collected to further understand the impact of these interventions. Themes were coded by a blinded reader and explored further with a follow up questionnaire. Results: All residents showed an increase in OSATS scores for flexible and rigid endoscopy (p<0.02, p<0.00) and cranial nerve exam (p<0.04). The number of endoscopies performed from 5 to 91 (p=0.02), but not for other skills like z-plasty and CT scan review. The three major themes that emerged from the qualitative data helped to provide clarity to the results. These themes include: Resource constraints, context specificity and, in-time assessments. Conclusion: Longitudinal international collaborations are worthwhile in emerging residency programs. Residents valued the relief of resource constraints, development of professional identity, and formalizing education delivery through assessments.

1015  Nicole Jedrzejko, General Surgery
Title:  A Systematic Review on Sustainability Criteria in Global Surgery
Joseph Margolick, Nicole Jedrzejko, S. Morad Hameed, Emilie Joo
Background: There is a major gap in access to surgery between High Income Countries (HICs) and Low and Middle Income Countries (LMICs). Building surgical capacity through global partnerships can help reduce this disparity. This is the only systematic review identifying all published studies on North American global surgical initiatives. The objective is to quantify collaboration in global surgery and propose a model for international cooperation and sustainability based on 6 pillars: multidisciplinary collaboration, bilateral authorship, effective training, broad community engagement, sustainable funding, and outcomes reporting.
Method: This systematic review uses the methodology established by the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA-P). PubMed, EMBASE and MEDLINE databases were searched. Selected studies were independently reviewed by two authors and assessed based on the Newcastle-Ottawa Scale. Results: A total of 4,489 citations were reviewed. Only 82 (1.8%) met our inclusion criteria. Excluded studies included military initiatives and those not arising from North American initiatives. Of the 82 initiatives, 44% had bilateral authorship, 54% provided training to practitioners from LMICs, 33% were multidisciplinary, 6% demonstrated sustainable funding, 44% provided data collection, and only 16% were involved in quality improvement initiatives. We identified 82 studies reporting true global surgery collaborative initiatives. The collaboration ranged from single teaching seminars to fellowship training. None of the studies fulfilled all 6 proposed pillars of sustainability. Conclusion: To be more collaborative and sustainable, global surgical partnerships should consider beginning with a foundation of bilateral exchange of knowledge, clear and measurable objectives, training, and continuous evaluation of program outcomes.

1025  Nadine Caron, General Surgery
Title:  The Northern Biobank Initiative: Dialogue to permit dialogue...lessons learned in establishing a First Nations Biobank
Nadine R. Caron UBC Dept of Surgery, Division of General Surgery; Brooke Boswell and Viktor Deineko: Project Managers for Northern Biobank Initiative; Megan Hunt and Nicole Cross: First Nations Health Authority; Laura Arbour: UBC Faculty of Medicine; Department of Medical Genetics
Background: “Precision medicine” and the associated biobanking, research and clinical genomics are playing a primary role in the evolution of medical care in Canada and around the world. While this is having impact on everything from screening, diagnosis, treatment and foundational understanding of disease, its success has become a potential driver of persisting health inequities in Canada. While Canada plays a prominent role in the area of precision medicine research, it should be noted that this is localized to metropolitan centers that have the associated academic institutions, genomic laboratories, human resources, and research budgets to permit this. Northern, rural and Indigenous populations are at best minimally represented and at worst actively excluded from the research and the subsequent beneficial impacts downstream. Often termed the “genomic divide”, it is anticipated that addressing this divide will prevent an exponential growth in the inequities of research funding, understanding at a population level for a broad spectrum of diseases and the associated clinical care. The Northern Biobank Initiative was introduced to create a research platform to start to address this genomic divide - including the most marginalized—the First Nations population. Objectives: 1. To provide education to increase the awareness and understanding of biobanking and genomic research among First Nations in northern British Columbia (BC) 2. To determine an approach to create a safe process in an ethical space for the development, implementation, and governance of a First Nations biobank in northern BC. Methods: Consultation with the leadership of the First Nations Health Authority (FNHA) determined the interest and methods in which to engage First Nations (FN) in the area of biobanking and genomics. This included FNHA executive
members and the establishment of the Northern First Nations Biobank Advisory Committee. Focus groups and key informant interviews with FN leaders and community members throughout the Northern caucus of British Columbia’s FNHA will be proposed and undertaken as the dialogue continues. Results: After 3 years of consultations with the FNHA, FN Chiefs, FN Health Directors and regional representatives, consent has now been obtained to commence formal consultations with their community members regarding the concept of a First Nations Biobank in northern BC. Conclusions: There is a relative absence of the Indigenous voice on a global scale in the area of genomics. Due process was required for the Northern Biobank Initiative to reach the point where a resolution was passed to permit formal consultations with FN communities in Northern BC. The dialogue will now include the concept of a FN Biobank, the underlying governance to be associated with it, cultural elements that must be implemented in order to ensure that this biobank has the scientific rigor while having the ethical applications and respect for First Nations communities and their history.

1050    William Jia, Neurosurgery
Title: A novel oncolytic HSV-1 vector for cancer immunotherapy
William Jia1,2, Luke Bu1,2, Guoyu Liu1,2, Dmitry Chouljenko2, Erica Lee2, Jun Ding2, Zahirul Dehvari1,2, Yonal Murad2, Will Li2
1University of British Columbia, 2Virogin Biotech Ltd.
Background: Oncolytic viruses (OVs) are among the most powerful approaches in cancer immunotherapy. Herpes simplex virus type-1 (HSV-1) has been approved by FDA as an oncolytic viral drug to treat melanoma. OVs cause cancer cell lysis and induces anti-tumor immune response from the host, resulting in lasting anti-tumor immunity. It has been recognized that anti-tumor immune response requires multiple immune regulatory factors that act synergistically and tumor microenvironment is critical for tumor to grow. Method: A HSV-1 oncolytic viral vector (VG161) was constructed to simultaneously express IL12, IL15 with its receptor alpha unit and a PDL-1 blocking peptide. Anti-tumor activity of VG161 was tested in both immune competent mice (CT26 and A20 tumor models) and nude mice for human tumor models (LNCap and U87), which allowed to test both oncolysis and anti-tumor immunity of the virus. Results: VG161 caused complete tumor eradication in all the models tested. VG161 virus induced tumor oncolysis caused complete tumor destruction in both LNCap and U87 tumors. In the CT26 model, no tumor could be found after re-challenging with the same tumor cells. The anti-tumor immune response by VG161 was significantly stronger than similar viruses that did not express any immune stimulating gene or only express GM-CSF. Furthermore, in a A20 double tumor model, intratumoral injection into the tumor on one side caused tumor regression on both sides. Transcriptom analysis showed significant change in tumor microenvironment. Finally, memory T-cells are evident in the treated animals demonstrated by multiple assays. Conclusions: VG161 is a novel oncolytic virus that are both strong in stimulating anti-tumor immunity and oncolytic activity. Intratumoral expressing multiple immune regulatory factors by an oncolytic virus may significantly change the tumor microenvironment to enhance efficacy of the oncolytic virus.

1100    Katrina Duncan, General Surgery
Title: Usability and Feasibility of a Mobile Electronic Trauma Health Platform
Katrina Duncan, Larissa Roux, Eiman Zargaran, Maureen Brennan, Hubert Bandurski, Ivan Muravyov, Alan Hubbard, Rachel Callcut, Mitchell Cohen, and Morad Hameed; University of British Columbia Division of General Surgery, T6 Health Systems, UC Berkeley, UC San Francisco, Denver Health
Introduction: Trauma remains a significant source of preventable morbidity and mortality globally. Computing technology has advanced significantly and “Big Data” has great potential in optimizing patient care. Hypothesis: We posited that it is feasible to develop a mobile electronic trauma health system that is capable of real-time data analytics at an individual patient level and usable in real-world settings. Methods: An iPad-based interface was developed by a multidisciplinary team which enables real-time point of care data collection. The data is then wirelessly relayed to a spectrum of data visualization and analytics applications to provide data analytics and optimize patient care. The initial platform was tested with nurses and residents using simulated data and a speak-out-loud protocol. After the system was refined, it was then put into use in a Level One Trauma Centre in Cape Town, South Africa. Results: The initial think-out-loud testing of the interface was completed with thirteen residents and nurses. Users appreciated the built-in tools for score calculation and the clinical practice guidelines which were generated specific to the individual patient. The most common concern regarded the speed of data entry. In Cape Town, the system has successfully been used to enter over 3300 patients, including over 150 trauma team activations. Conclusions: A mobile electronic health trauma interface was developed and found to be both feasible and usable in simulation testing and real-world clinical practice. Point of care data entry during a trauma resuscitation is possible and computing technology has progressed sufficiently to permit real-time data analytics to optimize patient care.

1110    Thilo Speckmann, General Surgery
Title: NPAS4 optimizes metabolism during excitation of pancreatic β-cells by suppressing HIF1α signalling
Paul V. Sabatini1,2, Thilo Speckmann1,2, Cuilan Nian1,2, Maria M. Glavas3, Chi Kin Wong1,4, Ji Soo Yoon1,2, Tatsuya Kin5, A.M. James Shapiro5, William T. Gibson1,4, C. Bruce Verchere1,6, Francis C. Lynn1,2,"1 Diabetes Research Group, BC Children’s Hospital Research Institute; 2 Department of Surgery, University of British Columbia; 3 Department of Cellular and Physiological Sciences, University of British Columbia; 4 Department of Medical Genetics, University of British Columbia; 5 Department of Surgery, University of Alberta and Alberta Diabetes Institute; 6 Department of Pathology and Laboratory Medicine, University of British Columbia.
Background: Depolarization of insulin-producing pancreatic β-cells results in calcium influx, which induces vesicle exocytosis and alters gene expression. These processes, along with restitution of resting membrane potential, are energy intensive. The bHLH-PAS transcription factor hypoxia inducible factor 1α (HIF1α) regulates energy homeostasis by shifting metabolism away from oxidative phosphorylation and towards glycolysis, which is undesirable in electrically excitable cells. As such, the presence of homeostatic mechanisms that counteracts HIF1α stabilization in activated β-cells seems likely.
Hypothesis: We hypothesized that cellular mechanisms exist to maximize energy production during excitation of pancreatic β-cells.
Methods: We investigated a role for Neuronal PAS domain protein 4 (NPAS4), a calcium-dependent immediate early bHLH-PAS transcription factor, in adjusting metabolism by utilizing β-cell specific knockout mouse models.
Results: We demonstrate that NPAS4 acts to maximize energy production by suppressing HIF1α. As such, knockout of Npas4 from insulin-producing β-cells results in increased expression of Hif1α target genes, reduced oxygen consumption, loss of insulin secretion, β-cell dedifferentiation and type 2 diabetes. In agreement with results from those with type 2 diabetes, Npas4−/− mice exhibit impaired glucose tolerance, and Npas4−/− mice exhibited increased HIF1α expression, due in part to elevated HIF1α signalling.
Conclusions: In conclusion, NPAS4 is critical for the coordination of metabolism during the stimulation of electrically excitable cells. Its loss leads to the defects in cellular metabolism that underlie the cellular dysfunction that occurs in metabolic disease.

1120    Kristin DeGirolamo, General Surgery
Title: Process Mapping in Surgery: A Systematic Review
Kristin DeGirolamo MD1 Karen O’Souza BSc1, Morad Hameed MD, MPH1 Surgery, University of British Columbia, Vancouver, Canada
Introduction: Quality improvement (QI) has been a longstanding and transformative force in manufacturing. In industry, process mapping (PM) and statistical process control (SPC) are established techniques to deconstruct complex processes into small, discrete steps, analyze variability around each step, and continuously identify opportunities to streamline processes. The purpose of this systematic review is to assess the impact of PM and SPC on surgical processes and outcomes. Materials & Methods: A systematic, English-language search of Ovid, EMBASE and MEDLINE was conducted for papers examining the impact of process mapping on Surgical care from 1946 to present. Key words used were “statistical process control”, “process map”, “Deming”, “Shewhart” AND “Surgical procedure”, “Operative”. From 138 papers, two independent reviewers identified 64 studies that met inclusion criteria. The evidence-based practice of improving quality (EPIQ) method was used to score quality and level of evidence. Results: 3 broad themes identified were economic impacts, patient outcomes and access to care systemically. 5 papers used time-driven activity based costing to compare the economics of resource-intensive procedures and potential cost-reducing strategies that maintained and emphasized value. 30 papers were identified as describing the use of SPC and PM to investigate QI initiatives aimed at improving perioperative complication rates; they noted decreased infection rates, adverse events, and postpartum haemorrhages as well
as increased co-morbidity variation impacting outcomes. The 29 remaining papers commented on systems and access to care. Using various PM techniques important issues such as delays to OR, access to endoscopy and surgical cancellations were addressed. PM helped address inefficiencies in these areas and reduced delays to both the OR and endoscopy, resulting in fewer cancelled cases and patient no shows.

**Conclusion:** Process mapping allows detailed insights into the variability and costs of complex processes. This review demonstrates many examples of how PM can be integrated into established surgical QI strategies to improve patient care. Models should be created and re-assessed to improve quality of care and financial performance of health systems.

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**1130**  
**Heather Denroche,** General Surgery

**Title:** Interactions between IAPP and innate immunity in islet amyloid-induced diabetes

Heather C. Denroche1, Ilona Alnojeidi1, Ruhangiz Kilani1, Layla Nabai1, Anthony Papp1, Aziz Ghahary1  
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**Background:** Insoluble aggregates of beta cell-derived islet amyloid polypeptide (IAPP) contribute to beta cell dysfunction in type 2 diabetes, however, the mechanism is unclear. IAPP aggregates induce secretion of pro-inflammatory cytokines from macrophages, eliciting islet inflammation and impaired beta cell function in mice. In vitro, IAPP aggregates stimulate cytokine expression via toll like receptor 2 (TLR2) signalling, and induce secretion of the cytokines IL-1β through activation of the nucleotide binding oligomerization domain, leucin rich repeat and pyrin containing 3 (NLRP3) inflammasome.

**Objective:** Determine whether IAPP aggregates induce beta cell dysfunction and subsequent diabetes in vivo through TLR2-dependent and/or NLRP3-dependent pathways. **Methods:** Mice expressing a human IAPP transgene in beta cells (hIAPP Tg/0 mice) which develop robust islet amyloid, islet inflammation, and a type 2 diabetes-like phenotype on high fat diet, were crossed with Tlr2−/− mice or Nlrp3−/− mice. In addition, we generated hIAPP Tg/0 mice with a myeloid-specific deletion of the TLR adapter protein, MyD88, via the Cre-lox system. **Results:** hIAPP Tg/0 mice displayed similar weight gain, but were significantly hyperglycemic and glucose intolerant relative to hIAPP 0/0 controls (which lack an aggregating form of IAPP). Surprisingly, TLR2 deficiency had no protective effect on glucose intolerance, diabetes incidence, islet dysfunction or islet inflammation in hIAPP Tg/0 mice. Moreover, myeloid-specific deletion of MyD88 did not offset hIAPP-induced beta cell dysfunction or diabetes development. In contrast, our preliminary results indicate that global deletion of NLRP3 attenuates diabetes progression in hIAPP Tg/0 mice. Conclusions: These data reveal that while TLR2 signalling is necessary for the pro-inflammatory response to IAPP aggregates in vitro, these pathways are not necessary for IAPP to induce islet inflammation and beta cell dysfunction in vivo. NLRP3 on the other hand appears to be important for IAPP aggregate-induced beta cell dysfunction in vivo.

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**1140**  
**Amir Pourghadiri,** Plastic Surgery

**Title:** The Use of a Liquid Skin Substitute Improves the Healing Outcome of Full-Thickness Wounds in a Porcine Model

Amir Pourghadiri1, Ilona Alnojeidi1, Ruhangiz Kilani1, Layla Nabai1, Anthony Papp1, Aziz Ghahary1  
1Department of Surgery, Division of Plastic Surgery, University of British Columbia.

**Background:** The use of autologous meshed skin grafts is essential for the survival of patients with large burns and skin defects. This technique allows for maximal coverage of the wound surface area, while minimizing the number of required donor sites. The expansion ratios can be done as low as 2:1, with open spaces that are twice the size of skin, and if necessary as high as 9:1. Although this procedure saves the lives of patients with severe burn injuries, large void areas remains open and vulnerable to infection, fluid and heat loss. Further, development of fishnet-like irregular scars is devastating not only for burn patients in terms of aesthetic appeal, but also for caregivers. **Objective:** In this study, we examined the effect of a collagen composite hydrogel (MeshFill) created by our team in Yorkshire pigs. **Methods:** We generated full-thickness wounds (k cm x k cm), and applied either: no treatment (NT) (n=4), MeshFill (MF) (n=4), meshed skin (MS) (n=2), or meshed skin + meshfill (MS+MF) (n=4). Wounds were dressed and photographed every 5 days. Sections 4 μm thick were collected at days 10 and 20, and analyzed for histology and immunohistochemistry (IHC). **Results:** MF-treated wounds were epithelialized and remained less contracted compared to NT wounds. MS+MF wounds revealed rete ridges, whereas the MS group lacked these ridges. **Conclusion:** Wounds treated with MF and MS + MF showed an accelerated healing outcome and reduced contraction. These results provide insight into the therapeutic benefit of a hydrogel-meshed skin treatment regimen.

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**1150**  
**Graeme Hintz,** Pediatric Surgery

**Title:** Stapled versus Hand-Sewn Pediatric Intestinal Anastomoses: A Retrospective Cohort Study

Graeme Hintz1, Elizabeth Dufresne1, Lisa Chao1, Carolyn Bell1, MD Undergraduate Program, Faculty of Medicine, University of British Columbia; Abdullah Alshehri, Division of Pediatric Surgery, Department of Surgery, British Columbia Children’s Hospital.

**Objective:** A retrospective analysis of patients undergoing intestinal anastomosis at a single tertiary centre between 2012 and 2016 was undertaken. **Methods:** Demographics, diagnosis, anatomy and complications were compared between the hand-sewn (HS) and stapled anastomosis (SA) groups. Primary outcomes were anastomotic leak and/or stricture requiring intervention. **Results:** There were 101 patients with 126 intestinal anastomoses (80 HS, 46 SA). The median age and weight were significantly higher in the HS vs. SA (10.3 vs. 59.7 months and 8.5 vs. 16.8 kg); the overall anastomotic complication rate was 20% and 13% respectively (not significant). Anastomotic complications in the ileocolic subgroup: 7/ HS vs. 0/14 SA (not significant). Anastomotic complications were higher in patients ≤ 10 kg compared to > 10kg, 27.9% vs. 8.9% respectively (p<0.01). Other complications were similar between groups. **Conclusion:** Overall, no statistically significant difference between hand-sewn and stapled intestinal anastomosis was found. Anastomotic complications were significantly higher in patients ≤ 10 kg.

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**1200**  
**Aria Shokoohi,** Radiation Oncology

**Title:** A Population-based Review of Salvage Surgery, Radioactive Iodine, External Beam Radiation and Systemic Therapy for Management of Recurrent Differentiated Thyroid Cancer

Aria Shokoohi, Eric Berthelet, Ann Wui, Sabrina Gill, Adam White, George Sersmith, Elton Proznan, Sam Wiseman, Cheryl Ho

**Introduction:** Management of recurrent differentiated thyroid cancer (DTC) may include surgery, radioactive iodine (RAI) and/or external beam radiotherapy (XRT). Patients may also be treated with systemic agents such as sorafenib and lenvatinib for RAI refractory DTC.

**Objective:** The study objective was to evaluate DTC recurrent disease treatment and utilization of systemic therapy. **Methods:** The British Columbia Cancer Agency (BCCA) provides cancer care for over 4.5 million Canadians. A retrospective review of all DTC patients referred to the BCCA between 2009 and 2013 was conducted. Baseline characteristics, local/distant recurrence, surgical management, RAI, external beam radiotherapy (XRT) and systemic therapy details were collected. Disease free survival (DFS) and overall survival (OS) were estimated using the Kaplan Meier method. **Results / Discussion:** 1070 DTC patients were referred to the BCCA with stage I–IVB disease (~70% of all diagnoses in the province). Median follow up 4.1 y. Baseline characteristics: female 73%, median age 50 y, histology; papillary 90%, follicular 7%, Hurthle cell 3%. Stage at presentation using the AJCC 7th edition: I 60%, II 8%, III 25%, IVA/IVB 7%. Local and/or distant recurrence occurred in 159 patients (15%). 120 (11%) of the patients with local recurrence were treated with primary surgery +/- RAI or XRT 51%, RAI +/- XRT 40%, XRT alone 1%, unknown 8%. 33 (3%) had a second recurrence and were treated with primary surgery +/- RAI or XRT 39%, RAI +/- XRT 27%, XRT alone 3%, and unknown 31%. Of 59 patients who developed distant metastatic disease 20 had prior local recurrence. Common sites of metastases were lung 73%, bone 29% and liver 10%. Of the entire cohort, 6 (0.6%) received systemic therapy with sorafenib. The 5 y DFS was 85% and OS was 95% for all patients.
Conclusions: In our population-based cohort, 85% of patients were cured by primary disease management. Local recurrence was successfully managed with surgery, RAI and/or XRT with no evidence of residual disease in 57% of patients. Multi-modality treatment of local recurrence facilitates complete disease ablation in the majority of patients, and despite a significant number of metastatic recurrences, only a small fraction of patients require systemic therapy.

1210  Staths Pripotnev, Plastic Surgery
Title: The Chevron Flap – A Case Series Demonstrating a Novel Flap Design and Applications
Staths Pripotnev, Ashley Tregaskiss, Division of Plastic Surgery, Department of Surgery, University of British Columbia

Introduction: The chevron flap is a novel bipedicled V-Y random pattern advancement flap with many advantages over primary closure, skin grafting, and other local flaps. It allows for soft tissue reconstruction commonly encountered with cancer excisions. Methods: This case series of 24 chevron flaps in 21 patients reviews the practical design, use, and applications of the flap while highlighting certain important considerations. Results: Defects varying in size from 15-89 cm² were reconstructed in 16 males and 5 females ranging in age from 15-89. In all 24 cases, there were 2 minor complications of superficial dehiscence, 1 case of superficial infection treated with antibiotics and no major complications such as partial or complete flap loss. Conclusion: The chevron flap is a versatile and reliable flap with applications almost anywhere on the body.

1320  Evie Landry, Otolaryngology
Title: The Use of Video Glasses in Pediatric Surgical Education
Evie Landry, MD; Michael Yang, MD; Julie Pauwels, MPH; Neil Chadda, MD; MBChB(Hons); MPH; BSc(Hons); FCSC, Division of Pediatric Otolaryngology–Head and Neck Surgery, University of British Columbia, Vancouver

Objective: One of the most common challenges in surgical education for trainees is gaining practical experience through observing procedures in the operating room. Due to the nature of some procedures, a narrow surgical view severely limits the learning experience. Video glasses are new devices that offer the potential to project the primary surgeon’s exact view to learners in real-time, allowing for an enhanced operative learning experience.

Study Design: Single center randomized prospective trial. Setting: Tertiary care pediatric hospital. Participants: Using block randomization, medical students and surgical residents observed either a tonsillectomy or adenoidectomy, either directly at table-side or by projected real-time video feed from the surgeon’s video glasses, in random order. Participants then completed a survey comparing aspects of their learning experience viewing the procedure through the video feed in comparison to direct observation. Main Outcome Measures: Evaluating the hypothesis that video glasses provided an improved overall learning experience and a realistic simulation of the open surgical procedures tested. Results: 23 trainees participated in the study. Survey results demonstrated that the overall learning experience with the use of video surgical glasses was significantly improved when compared to direct visualization alone. (82/100 average Visual Analog scale (VAS) score vs. 64/100, p=0.021) Video glasses were shown to be superior when comparing the view of the surgical field (83/100 vs. 54/100 on VAS, p<0.001) and the ability to identify anatomical structures (79/100 vs. 56/100 on VAS, p=0.001). The ease of following surgical steps with video glasses was shown to have a statistically significant difference when compared to direct visualization. (81/100 vs. 69/100 on VAS, p=0.039) All participants stated that video glasses closely simulated the learning environment of the real-life open procedure. Conclusion: This study showed that the use of video glasses was beneficial for surgical education and a realistic tool for learners at varying levels of training. Video glasses may significantly improve the learning experience for procedures with a narrow field of view.

1330  Andrew Thamboo, Otolaryngology
Title: 5-Year Outcomes of Salvage Endoscopic Nasopharyngectomy for Nasopharyngeal Carcinoma
Andrew Thamboo MB, MD; MSc; 2. Vishal Patel BSc; 3. Peter H. Hwang MSc 1. Division of Rhinology, Department of Otolaryngology – Head and Neck Surgery, Stanford University School of Medicine, Palo Alto, CA 2. Department of Otolaryngology – Head and Neck Surgery, University of British Columbia, Vancouver, British Columbia, Canada

Background: Recurrent nasopharyngeal carcinoma (rNPC) can be salvaged with re-irradiation, open nasopharyngectomy, and more recently endoscopic nasopharyngectomy. However, long-term outcomes of endoscopic approaches are lacking. Thus, we report 5-year outcomes following endoscopic nasopharyngectomy for rNPC. Objective: To investigate the 5-year outcomes following endoscopic nasopharyngectomy for rNPC in North America. Methods: Patients who underwent endoscopic nasopharyngectomy for rNPC between November 2004 and November 2016 were retrospectively reviewed. Inclusion criteria included a minimum 5-year follow-up time after surgery. Presenting (pTNM) status and recurrent (rTNM) status for each recurrence was determined. Outcomes included margin status, disease recurrence, death, and complication rates. Results: Thirteen patients were included. Mean time follow-up was 74.3 months (range = 56.4 – 96 months). Negative margins were achieved in 77% of initial cases. Positive margins were associated with higher rT stages. Recurrence was seen in 6 patients, which was also associated with a higher pStage and rStage. All patients with positive margins had re-recurrence. Four patients required repeat endoscopic nasopharyngectomy and two received chemoradiation. All four with a second endoscopic procedure had further disease recurrence. Five-year local disease-free and overall survival rates were 53.9% and 84.6%, respectively. The minor complication rate was 52.6%, major operative complication rate was 0.0%, and late complication rate was 23.1%. Conclusion: Endoscopic nasopharyngectomy demonstrates promising 5-year overall survival rate for rT1-2 and select rT3 cases of rNPC with a favorable complication rates. Lower rStages were associated with a higher disease-free rate, and lower complications of superficial dehiscence, one case of superficial infection treated with antibiotics and no major complications such as partial or complete flap loss. Conclusion: The chevron flap is a versatile and reliable flap with applications almost anywhere on the body.

1340  Kimberly Luu, Otolaryngology
Title: Virtual Surgery and Stereolithography for Complex Head and Neck Reconstruction
Kimberly Luu, Amrirez Padigel, Edward Wong, Eitan Prisman, Department of Otolaryngology, University of British Columbia

Introduction: Stereolithography is a technology that can be applied to virtual planning and creation of surgical guides for mandibular reconstruction. Studies on this technology used third party software, which are costly and requires the surgeon to relinquish design control. The objectives of this study are to validate the functionality of an in house automated software tool for mandibular reconstruction and to determine if stereolithography can be a useful educational tool. Methods: Software, written in house, segments a CT scan and takes input of resection margins to calculate fibular segments that optimize for contour and bony opposition. Cutting guides are automatically created and printed. In a simulation lab, ten Otolaryngology residents were randomly assigned to a free-hand or guided group and tasked with resecting and reconstructing a carcinoma invaded mandible. The final reconstructions were compared on: change from native mandibular width and projection, segment gap distance, expert assessment, and reconstruction time. Face validity was assessed via a questionnaire. Results: Thirteen patients were included. Mean time follow-up was 74.3 months (range = 56.4 – 96 months). Negative margins were achieved in 77% of initial cases. Positive margins were associated with higher rT stages. Recurrence was seen in 6 patients, which was also associated with a higher pStage and rStage. All patients with positive margins had re-recurrence. Four patients required repeat endoscopic nasopharyngectomy and two received chemoradiation. All four with a second endoscopic procedure had further disease recurrence. Five-year local disease-free and overall survival rates were 53.9% and 84.6%, respectively. The minor complication rate was 52.6%, major operative complication rate was 0.0%, and late complication rate was 23.1%. Conclusion: Endoscopic nasopharyngectomy demonstrates promising 5-year overall survival rate for rT1-2 and select rT3 cases of rNPC with a favorable complication rates. Lower rStages were associated with a higher disease-free rate, and lower complications of superficial dehiscence, one case of superficial infection treated with antibiotics and no major complications such as partial or complete flap loss. Conclusion: The chevron flap is a versatile and reliable flap with applications almost anywhere on the body.

1350  Jordan Tran, Radiation Oncology
Title: Adolescent and Young Adult Central Nervous System Tumor Survivors: An Assessment of the Documentation of Late-Effects Risks and Screening Recommendations
Jordan Tran1, Fuchsia Howard2, Michael McKenzie3, Avis Uileet4, Karen Goddard1 1 Faculty of Medicine, University of British Columbia, 2 Faculty of Applied Sciences, School of Nursing, University of British Columbia, 3 Department of Radiation Oncology, British Columbia Cancer Agency, 4 Specialized Clinics, Patient Experience & Interprofessional Practice, British Columbia Cancer Agency

Conclusions: In our population-based cohort, 85% of patients were cured by primary disease management. Local recurrence was successfully managed with surgery, RAI and/or XRT with no evidence of residual disease in 57% of patients. Multi-modality treatment of local recurrence facilitates complete disease ablation in the majority of patients, and despite a significant number of metastatic recurrences, only a small fraction of patients require systemic therapy.
Introduction: Adolescent and young adult (AYA) (ages 15-35) cancer survivors, particularly those treated for a central nervous system (CNS) tumor, are very likely to be at ongoing risk for late effects. Late effects are long term health problems that occur more than 5 years after the end of therapy. At least two-thirds of cancer survivors treated with radiation therapy (RT) are likely to develop a life threatening or serious late effect. Community-based follow-up care by primary care providers is necessary to ensure AYA CNS survivors have access to life-long follow-up care to screen for and manage potential complications resulting from treatment. Yet, it is unclear what patient-specific information is available to primary care providers to inform this care. Understanding the nature of documented late effects risks and screening recommendations could provide the foundation for improving written communication between oncology and primary care, which is essential for improving health services and patient outcomes. Objectives: The research objective was to assess the quality and quantity of the documentation of risks for late effects and recommendations for follow-up among AYA patients treated for a CNS tumor at the British Columbia Cancer Agency (BCCA). Methods: This was a retrospective review of charts of AYA patients who were diagnosed with a CNS neoplasm or arteriovenous malformation (AVM) and treated with cranial radiation therapy between 1985 and 2010 at any BCCA treatment center. Data was abstracted using a standardized collection form to assess the written documentation in the narrative chart including, the initial consultation with the treating oncologist, follow-up/progress notes, treatment summaries, and the discharge summary. Descriptive statistics were used to determine the proportion of patient charts that contained reference to late effects risks, late effects screening recommendations, communication of late effects risks with the patient, as well as the most commonly documented late effects risks and recommendations. Results: 136 patients met the inclusion criteria and 134 were reviewed. The majority (85%) were diagnosed with a brain neoplasm and 15% with an AVM. Treatment consisted of partial brain RT for 80% and craniospinal RT for 10%, and 17% received chemotherapy. Half of patients were discharged from the BCCA with a dictate while 50% were “lost to follow-up” (had scheduled appointments but failed to attend). There was no specific documentation for late effect risks for 45% of patients, and 76% of patients did not receive any screening recommendations. At discharge, 6 patients (4%) received documentation about specific late effects and 16 patients (12%) had screening recommendations, with pituitary hormone screening most commonly recommended (11% of patients). There was an increase in the documentation of late effects risks between 1980-1989 to 1990-1999 to 2000-2010 from 22% to 70% to 88%, respectively. The most common late effect documented was radionecrosis (36 instances).

Conclusions: Historically, there has been minimal documentation of the late effects risks and screening recommendations for AYA patients treated for CNS tumours at the BCCA. In recent years, documentation of specific late effects has increased, perhaps reflecting increased knowledge about the late effects of cancer treatment, but the completeness of charts and the communication of risks and recommendations to patients leaves much room for improvement. A care plan as part of the discharge summary indicating potential late effects and screening recommendations is likely to be helpful in guiding the care of long term of cancer survivors followed in the community.

1500  Gary Yang, Vascular Surgery

Title: Utilization of spinal drain and intraoperative neurophysiologic monitoring in thoracic endovascular aortic repair

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Background: Adjuncts for early detection and treatment of spinal ischemia in thoracic aortic surgery are supported by robust clinical experience in open repair. The utility of cerebrospinal fluid (CSF) drainage and neurophysiologic monitoring (NPM) in thoracic endovascular aortic surgery (TEVAR) is less clear. In our institution, NPM and CSF drains are used in all complex TEVAR cases and in selected standard TEVAR procedures. The low rate of spinal cord injury (SCI) in standard TEVAR, combined with potential risks associated with CSF drainage have lead us to review our experience with liberal utilization of CSF drains and NPM.

Objective: To evaluate our experiences with CSF drain and NPM usage to prevent SCI in TEVAR.

Methods: This was a retrospective analysis of all patients undergoing endovascular thoracic aortic repair from a single institution between 2007-2016. Complex thoracoabdominal interventions were excluded. Preoperative characteristics, aneurysm extent and etiology were reviewed. Utilization of CSF drains, including volume of fluid removed, duration of drainage and catheter related complications were collected. NPM data was reviewed to determine influence on intraoperative management. Results: A total of 223 patients had TEVAR and 130 met the inclusion criteria. Cerebrospinal drainage was used in 71 patients (54.6%). On average, drains were kept in for 1.6 ± 0.2 days, with over two thirds being removed on the first post-operative day. Median total drain output was 168 ± 31 ml. Complications related to CSF drainage occurred in 4 patients (5.6%) with major complications occurring in 2 patients (2.8%). Intraoperative NPM was used in 56 (43%) patients. Changes in motor evoked potentials were noted in half of these patients, and represented mild unilateral leg ischemia in all but two cases. In these two patients, changes consistent with spinal cord ischemia were noted and both resolved with augmentation of blood pressure. Neither patient developed post-operative SCI. Total graft length > 200 cm was found to be predictive of SCI (HR = 19.64; 95% CI 1.09-202.41; P = 0.042).

Conclusions: SCI after TEVAR is rare, and is most commonly delayed in presentation. Intraoperative monitoring identified two patients with a suspected spinal cord event that lead to changes in clinical management. None of the patients with clinically evident SCI had NPM changes and all could have had CSF drainage catheters placed at the time of their event.

1510  Mostafa Fatehi, Neurosurgery

Title: A 40-Year Review of Demographics and Clinical Outcomes of Adult Burn Patients Admitted to a Single Provincial Burn Centre

Tyler Omeis, MD, Division of Plastic Surgery; Kevin Nickel, BSc, UBC Faculty of Medicine; Anthony Papp, MD PhD, Division of Plastic Surgery

Background: Burn admissions are associated with lengthy hospital stays, high mortality rates, and significant costs to the healthcare system. This study was designed to evaluate trends in demographics and outcomes of all burn patients admitted to a provincial burn centre over a 40-year period.

Objective: To discuss trends in the demographics and outcomes of burn related admissions over the last 40 years. Methods: Demographic and clinical data was extracted from a provincial burn database on all burn patients admitted between 1976 and 2015. Patient demographics, Baux score, complications, length of stay and mortality rates were all reviewed. The recorded data was evaluated and divided into 5-year increments to summarize the findings.

Results: Between 1976 and 2015 there were a total of 5151 admissions to our centre. Rate of admissions steadily declined up until 1998, after which, admissions remained constant. Males represented 74% of all admissions. The average age increased by 2.5 years per 5-year time window. Baux score increased by 2 points per 5-year window. The mortality rate of all comers remained constant at 6.3% over the 40 years studied. The survival rate of patients requiring hemodialysis for renal failure increased to 90% in the last 5 years. Increased age, Baux score, female gender, and complications including renal failure, pneumonia, aspiration pneumonia, and septicemia were all associated with significantly increased mortality rates.

Conclusion: The incidence of burn related admissions has remained constant in the last 15 years despite an increase in the average age and Baux score. Trends of increased survival rate in patients with high risk complications such as renal failure requiring hemodialysis suggests that there has been an improvement in the management of higher risk patients.

1520  Gautamn Sarwal, Vascular Surgery

Title: Technique and complications of extended iliofemoral endarterectomy for severe iliofemoral arterial disease

Gautamn Sarwal, MD MEd (Cand), 1 Jonathan Misskey, MD MEd, 2 John D.S. Reid, MD FRCP, 3 Ravinder Sidhu, MD MEd FRCP, 3 and Peter S. MacDonald, MD FRCP

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Objective: To demonstrate our novel approach to managing severe iliofemoral disease, with a single incision, extended iliofemoral endarterectomy (IFE). Methods: We performed a retrospective review of all patients undergoing IFE from 2007 to 2015 at our institution. This included patients who underwent IFE, with or without an additional procedure for inflow or outflow improvement.

Surgical Technique: The common femoral artery (CFA) and external iliac artery (EIA) are exposed via a vertical or oblique groin incision. All side branches are ligated and proximal control achieved with balloon occlusion.
The CFA is then transected at its bifurcation and everted superiorly to the EIA. The endarterectomized segment is then re-anastomosed in an end-to-end fashion onto the CFA bifurcation or its branches, thus providing an autologous arterial reconstruction. **Results:** 112 patients underwent IFEE with a total of 140 limbs over eight years. 59 limbs (42.1%) presented with critical limb ischemia and a mean ankle brachial index (ABI) of 0.46±0.26. Mean age was 72.1 years and the American Society of Anaesthesiologists grade was three. A vertical incision was used in 93 cases. Post endarterectomy, the iliofemoral segment was re-anastomosed to the CFA bifurcation in 68 limbs (48.6%), PFA in 70 limbs (50%) and SFA in two limbs (1.4%). 49 procedures (35%) involved an additional profunda femoris or superficial femoral arterial endarterectomy. 72 patients had adjunctive re-vascularization procedures including iliac stenting (40%) or distal bypass (31%). The 30-day mortality was 3.6%, one of whom died secondary to an underlying malignancy. We noted 15 (10.1%) systemic complications and 16 (11.4%) minor complications. Systemic complications included four myocardial infarctions, one stroke, seven cases of sepsis and four cases of acute limb ischemia requiring thrombectomy. There was one patient with technical failure due to chronic occlusion. Minor complications included four groin infections, six wound dehiscences, and six surgical site collections, all managed conservatively. We report no amputations. **Conclusion:** IFEE is a safe and alternative means of treating severe iliofemoral arterial disease.

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1530  
**Javier Ospina, Otolaryngology**  
**Title:** Endoscopic Craniofacial Resection and Endoscopic Assisted Craniofacial Resection for locally advanced anterior skull base Tumors.  
**Javier Ospina MD, Fellow Rhinology & Skull Base Surgery – Division of Otolaryngology Head & Neck Surgery; Sarpeet Sekhon, UBC Medical student; Arif Janjua MD FRCS, Clinical Assistant Professor - Rhinology & Skull Base Surgery - Division of Otolaryngology Head & Neck Surgery; Peter Gooderham MD FRCS, Clinical Assistant Professor - Division of Neurosurgery**

**Introduction:** Tumors involving the anterior skull base are challenging due to the complex anatomy and important structures that may be involved. Traditionally, Craniofacial resection and Transfacial approaches have been employed in the surgical management of such tumors. Recently, Endoscopic Craniofacial Resection (eCFR) and Endoscopic Assisted Craniofacial Resection (e-aCFR) have proven to be effective in select patients, showing similar oncologic outcomes and a significant reduction in complications and morbidities. **Objectives:** The objective of this study was to evaluate the early outcomes, pitfalls and complications of our series of patients who underwent endoscopic, or endoscopic assisted approaches for skull base tumors in the last 4 years. **Methods:** Retrospective analysis of the medical charts of patients with anterior skull base tumors treated with cCFR and e-aCFR, from January 2013 to July 2017. **Results:** A total of 21 patients underwent eCFR or e-aCFR for anterior locally advanced skull base tumors (11 eCFR and 10 e-aCFR). 18 Malignant Tumors and 3 Benign tumors. The malignant tumors were 9 Esthesioneuroblastomas, 6 with very locally advanced disease (5 with T4 or Kadish C, and 1 T3 or Kadish C), 3 with moderate advanced disease (3 Kadish B or T2). 4 Adenocarcinomas (T4b), 2 Neuroendocrine carcinoma (T4b) and 1 SNUC (T4a) and 1 SCC (T4b). Of the malignant tumors 2 were previously treated with radiotherapy and 3 surgically resected. Of the benign tumors 1 was an Inverted Papilloma (T4a) and 2 fibro-osseous lesions involving the skull base. For skull base reconstruction Nasoseptal flaps were used in 11 patients (52%), 8 Fascia Lata grafts (38%) 6 synthetics Dural repairs (28%), 6 pericranial flaps (28%), and 3 Fat graft (14%), 1 Titanium mesh (4%) and 1 collagen matrix (4%). For malignant tumors 13 (61%) patients underwent adjuvant treatments after surgery. 9 (50%) received a combination of Radiotherapy and Chemotherapy, 1 (5%) patient was treated with Chemotherapy and 1 (6%) with radiotherapy only. As Neo-adjuvant treatment only 1 (5%) patient had Chemotherapy. The average length of follow-up was 22.3 months (range from 4 to 54 months). All patients were alive at moment of follow-up except for one patient who had a SNUC and died presenting distal metastasis to sacrum and pelvis. We found 3 (14%) postoperative CSF leak, 2 immediate postoperative and 1 delayed with meningitis (no neurological sequelae). 1 patient had intraoperative seizures, 1 patient developed seizures after adjuvant radiotherapy and 1 required a second intervention for a late encephalophele. None of these patients have long-term sequela. 7 (38%) of the 18 locally advanced malignant tumors developed recurrences; the average time between recurrence and surgery was 12 months. 2 (28%) of these recurrences were treated as a rescue surgery for previous radiotherapy and 3 (42%) of them didn’t have adjuvant treatments after surgery. There were no recurrences on the benign tumors subgroup. **Conclusions:** For selected cases, eCFR and e-aCFR could be safe and effective to treat locally advanced tumors involving the anterior cranial base. Recurrences were found more frequent in previously treated patients and those without adjuvant treatment. Multidisciplinary and team approach to these complex lesions is essential to archive favorable outcomes.

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1540  
**Percy Edwards, Cardiac Surgery**  
**Title:** Using CT Angiograms to Predict Conversion to Sternotomy or Complicated Anastomosis in Patients Undergoing Robotic-assisted Minimally Invasive Coronary Artery Bypass  
**Edward Percy1, Richard Cook1, Anthony Fung2, John Mayo3 1. University of British Columbia, Division of Cardiovascular Surgery 2. University of British Columbia, Division of Cardiology 3. University of British Columbia, Department of Radiology**  

**Background:** Robotic-assisted minimally invasive direct coronary artery bypass (RA-MIDCAB) is an alternative to sternotomy-based surgery in properly selected patients. Identifying the left anterior descending artery (LAD) when it is deep in epicardial fat, however, can be challenging through a minimally invasive incision. In some patients, conversion to sternotomy is necessary. **Objective:** To evaluate a technique for predicting conversion to sternotomy or complicated anastomosis using pre-operative cardiac-gated computed tomography angiograms (CTA). **Methods:** Retrospective review of 75 patients who underwent RA-MIDCAB. The distance from the LAD to the myocardium (LTM) was measured on a defined “S-chamber” axial CT view. The relative risk of sternotomy or complicated anastomosis was compared between patients whose LAD was resting directly on the myocardium (LTM distance = 0mm) with those whose LAD was resting above (LTM distance > 0mm). **Results:** The average LTM distance was 3.2+/-2.6mm (range 0 – 11.5mm). Fourteen patients (18.7%) had an LTM distance = 0mm. Of the entire group of 75 patients, 6 (8.0%) required conversion to sternotomy. Four others (5.3%) were reported to have a complication with the anastomosis intra-operatively. For patients with LTM distance = 0mm, the relative risk of sternotomy or complicated anastomosis was 18.0 (95% CI: 4.3 – 75.6, p = 0.0001). **Conclusions:** In our experience, patients with LTM distance = 0mm were at significantly higher risk of either conversion to sternotomy or technically complicated anastomosis. This novel measurement may be useful to identify patients with anatomy which is unsuitable for the RA-MIDCAB approach.
Mostafa Fatehi Hassanabad, Neurosurgery
Title: Patient Outcomes After Treatment of PICA Aneurysms
Mostafa Fatehi Hassanabad 1, Peter A Gooderham1, Charlotte Dandurand 1
Division of Neurosurgery, Vancouver General Hospital

Background: Aneurysms of the posterior inferior cerebellar artery (PICA) are a rare cause of subarachnoid hemorrhage (SAH). Furthermore, their treatment is challenged by a high proportion of fusiform aneurysms and the tortuosity of the PICA. Similar to other intracranial aneurysms, the choice of surgical vs. endovascular treatment depends on patient characteristics and clinician expertise. Objectives: To determine whether there are outcome differences between surgical and endovascular treatment. We aim to ascertain patient characteristics or aneurysm features which predict treatment choice and patient outcomes.

Methods: A single-center, retrospective chart review of patients admitted to Vancouver General Hospital (VGH) with PICA aneurysms. Data collection was limited to patients admitted between 2005 and 2015. Primary outcomes assessed were patient mortality and length of stay (LOS) in hospital.

Results: A total of 54 patients were included in this study; of these, 39 patients were surgically treated while 11 underwent endovascular coiling. There were no significant differences in patient age or gender in each treatment group. Moreover, the primary outcomes were not statistically different; though there was a trend toward longer LOS in the surgical patients. Conclusions: Here we present a large series of patients presenting with a rare intracranial aneurysm. Our institutional experience is unique in North America in the preponderance of surgical management. There were no statistically significant differences in the primary outcomes measured. Future work will assess patient functional status and quality of life.

Serge Makarenko, Neurosurgery
Title: A Novel Scale for Describing Visual Outcomes in Patients Following Resection of Lesions Affecting the Optic Apparatus – Unified Visual Function Scale
Serge Makarenko MD BSc 1, Vincent Ye BSc 2, Peter A. Gooderham MD FRCSC 1, Ryojo Akagami MD MRCSC FRCSC 2 Department of Surgery, Vancouver General Hospital

Background: Historically, descriptions of visual acuity and visual field change following intracranial procedures has been very rudimentary. Clinicians and researchers have often used basic descriptors such as “improved”, “worsened”, and “unchanged” to describe outcomes following resections of tumours affecting the optic apparatus. These descriptors are vague, difficult to quantify, and are challenging to apply in a clinical perspective. Several groups have attempted to combine visual acuity and visual fields into a single assessment score, but these are not user-friendly. Objective: We present a novel way to describe a patient’s visual function as a combination of visual acuity and visual field change that is simple to use and can be used by surgeons, and researchers to gauge visual outcomes following tumour resection. Methods: We combined visual acuity and visual fields into three categories designed around the definition of legal blindness and fitness to drive in Canada. We then assigned a score to each and compared it to our previously published case series of perisellar meningiomas to document and test overall visual outcomes for patients undergoing tumour resection. The results were compared against previously published visual loss scales in the literature. Results: With our scale, we were able to capture the overall visual change while being sensitive enough to define the overall improvement or worsening quantitatively, using categories that are clinically relevant and understandable. Conclusion: The Unified Visual Function Scale is a robust way to assess a patient’s vision combining both visual acuity and visual field. The implementation of pre- and post-operative assessment is both sensitive enough to assess overall change, while providing clinically relevant information for surgeons, and allows for comparisons between treatment groups.

Joseph Margolick, General Surgery
Title: Systematic Review and Meta-analysis of Unplanned Reoperations, Emergency Department Visits and Hospital Readmission After Thyroidectomy
Joseph Margolick, Wenhua Chen, Sam M Wiseman

Unplanned reoperation, Emergency Department (ED) visits, and hospital readmission following thyroid operations are a source of frustration for both surgeons and patients. The objective of this review was to systematically evaluate the literature in order to determine the contemporary rates of reoperation, readmission and ED visits following thyroid operations. A secondary objective was to identify practices that show promise in reducing the occurrence of these post-operative events. Twenty-two studies were included in the systematic review. Meta-analysis was performed to obtain the weighted-pooled summary estimates of rates of reoperation, ED visit and unplanned hospital readmission. Jackknife sensitivity analyses was performed for each dataset. In order to detect publication bias and the small-study effect, funnel plot analysis was performed. The pooled rate estimate for reoperation was very low (0.6% [95% CI: 0.3–1.1%]). This was subject to publication bias because small studies tended to report lower rates of reoperation. The pooled rate of ED visits was 8.1% (95% CI: 6.5%–9.8%) while the pooled rate of hospital readmission was 2.7% (95% CI: 2.1–3.4%). Neck hematoma was the most common reason for reoperation while post-operative hypocalcemia was the most common reason for hospital readmission. ED visits and hospital readmission after thyroidectomy are not uncommon. Routine post-operative calcium and vitamin D supplementation may reduce rates of post-operative hypocalcemia, and avoiding post-operative hypertension may decrease the risk of neck hematoma. Older age, thyroid cancer, dependent functional status, diabetes, COPD, steroid use, hemodialysis and recent weight loss increase the risk of hospital readmission after thyroid surgery.

Charlotte Dandurand, Neurosurgery
Title: Adult cranioopharyngioma: case series, systematic review and meta-analysis
Charlotte Dandurand MD1, Amir Ali Sepehry BA MSc PhD2; Mohammad Hossein Asadi Laroi3; Ryojo Akagami, MD BSc MRCSC FRCSC 1; Peter Gooderham, MD FRCS1*
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Background: The optimal therapeutic approach for adult cranioopharyngioma remains controversial. Some advocate for gross total resection (GTR), while others advocate for subtotal resection followed by adjuvant radiotherapy (STR + XRT). Objectives: To conduct a systematic review and meta-analysis assessing the rate of recurrence in follow-up of three years in adult cranioopharyngioma stratified by extent of resection and presence of adjuvant radiotherapy. Methods: MEDLINE (1946 to July 1st 2016) and EMBASE (1980 to June 30th 2016) were systematically reviewed. From 1975 to 2013, 33 patients were treated with initial surgical resection for adult onset cranioopharyngioma at our center. Results: Data from 22 patients were available for inclusion as a case series in the systematic review. Eligible studies (n=21) were identified from the literature in addition to a case series of our institutional experience. Three groups were available for the rate of recurrence in follow-up of three years in adult craniopharyngioma stratified by extent of resection and presence of adjuvant radiotherapy. The rates of recurrence were 17%, 27% and 45%, respectively. The risk of developing recurrence was significant for GTR vs. STR + XRT, and STR + XRT vs. STR (OR: 0.89, 95% CI: 0.35-2.37) and STR + XRT vs. STR (OR:0.20, 95% CI: 0.10-0.41). Risk of recurrence after GTR vs. STR + XRT did not reach significance (OR: 0.63, 95% CI: 0.33-1.24, P = 0.18). Conclusion: This is the first and largest systematic review focusing on rate of recurrence in adult cranioopharyngioma. Although rates of recurrence are favoring GTR, difference in risk of recurrence did not reach significance. This study provides guidance to clinicians and directions for future research with the need to stratify outcomes per treatment modalities.

Heitham Gheriani, Otolaryngology
Title: Frontal Ostium Grade (FOG) - A NEW CT Grading system for a safe surgical approach to the frontal sinus
H Gheriani, J W Alabjar, A Habib, A Javer. Division of Otolaryngology and the St Paul’s Sinus Centre, Department of surgery, St Paul’s Hospital, Vancouver

Introduction: Anatomical variability of the frontal recess makes endoscopic surgery in the region potentially challenging to both beginners and senior surgeons. The location and size of the frontal sinus ostium is critical in determining the level of difficulty the surgeon will face during dissection. The frontal process of the Maxilla is a constant landmark that forms part of the antero-lateral frontal sinus drainage pathway below the Ostium. The smaller the frontal sinus ostium...
diameter, and the more anterior its location in relation to the frontal process of maxilla, the more difficult is the surgical access. We propose a new CT grading system for the frontal sinus that is specific to the anatomical position of the frontal sinus ostium.

**Objective:** To create a novel Frontal Ostium Grading (FOG) system using Computerized Tomography (CT). **Method:** On sagittal CT, a vertical line is drawn through the frontal process of the maxilla along its vertical axis (line R). The second line (S) is placed at the point of upturn of the anterior skull base in the same plane. If the second line (S) is posterior to the reference line (R), then the Frontal Grade is termed FOG positive (+ve). A positive FOG grade implies that the frontal ostium will be surgically more accessible as opposed to a CT where the S (second) line is anterior to the R line, which will be termed as a FOG (-ve) negative, thereby making the ostium much more difficult to access. If both S and R lines overlap each other, then the frontal sinus ostium grade is termed FOG (N) Neutral. **Results:** A total of 348 CT scans for patients who had undergone sinusonal surgery over the past 3 years were examined. Of these, 297 (85.3%) were found to be suitable for inclusion in the study. A total of 206 (69.4%) on the left and 188 (63.3%) on the right were found to be FOG +ve compared to 27 (9.1%) on the left side, 25 (8.4%) on the right side which were found to have a FOG -ve grade. A total of 45 (15.2%) on the left and 58 (19.5%) on the right were FOG Neutral.

**Conclusion:** We introduce a new frontal sinus anatomical CT grading system designed to help in the planning of endoscopic frontal sinus surgery, and in predicting the level of surgical difficulty, training and expertise required to safely and successfully perform surgery in this difficult area.

**A06**

**Title:** Dual-energy Computed Tomography Should Be The First Line Preoperative Localization Study For Individuals Undergoing Parathyroidectomy For Treatment of Primary Hyperparathyroidism

**Methods:** A Retrospective review was carried out at a single center, of all PHP patients, not undergoing reoperation, that had undergone a preoperative DE-CT for PT localization. Data collected included: clinical characteristics, laboratory values, imaging results, operative and pathology findings, and patient outcomes. **Results:** 97 PHP patients made up the study population. The sensitivities and accuracies for preoperative DE-CT were: ultrasound: US (42.2%) and 92.7%, Tc-99m sestamibi noncontrast single photon emission computed tomography: CT-MIBI (67.0%) and 96.8%, and for DE-CT was 87.6% and 95.8%, respectively. In the subgroup of 32 patients (33%) that did not localize with CT-MIBI and/or US, DE-CT correctly localized a PT in 21 cases (65.6%). A combination of: CT-MIBI and US correctly localized a PT in 65.9% of cases, DE-CT and US correctly localized a PT in 86.4% of cases, and three tests together correctly localized a PT in 89.8% of cases. Only 5.7% of the cases that were accurately localized by a combination of CT-MIBI and US were not identified by DE-CT. **Discussion:** DE-CT should be utilized as a first line preoperative localization study for PT in PHP patients because it is not only more sensitive than CT-MIBI and US, but also correctly locates the majority of PTs that are not identified by these two commonly employed imaging studies.

**A07**

**Title:** Papillary Features in Thyroid Nodules Diagnosed as Atypia of Undetermined Significance or Follicular Lesion of Undetermined Significance Increases Cancer Risk And Should Influence Treatment

**Methods:** A Retrospective review of the records of all individuals undergoing preoperative FNAB to establish the presence of papillary features. **Results:** Of the 58 FNAB specimens (52.3%) that did not exhibit papillary features had a significantly lower localized by a combination of CT-MIBI and US were not identified by DE-CT. **Conclusion:** For PT in PHP patients because it is not only more sensitive than CT-MIBI and US, but also correctly locates the majority of PTs that are not identified by these two commonly employed imaging studies.

**A08**

**Title:** Temozolomide-loaded polymeric microparticles for treatment of glioblastoma multiforme

**Methods:** We use oil-in-oil emulsion to encapsulate TMZ in PLGA microparticles. Encapsulation efficiency and release rate of the drug was measured and compared to the oil-in-water single emulsion and double emulsion methods that were previously used by others literature. The effect of PLGA concentration on the release rate and encapsulation efficiency of the drug was also investigated. **Results:** We obtained the encapsulation efficiency of 65%, which is significantly higher than other encapsulation methods. We also achieved the sustained release of up to a month using the optimized formulation. **Conclusion:** The overhanging goal of this work was to develop synthesize TMZ-loaded microcarriers with high encapsulation efficiencies and extended release profiles for treatment of GBM.
biopsy-based screening protocol for detection of HPV-positive tumors in the throat were unsuccessful. This is likely because tumors initiate at the base of large invaginations whereas brush biopsies collect only the histologically normal surface epithelial cells, which lack HPV that is associated with the tumor cells. We hypothesize that such surface epithelial cells contain malignancy-associated changes (MACs), subtle morphological and/or molecular changes in normal-appearing cells adjacent to a tumor, which could be used as diagnostic biomarkers. **Objectives:** MACs have been identified as promising biomarkers for the diagnosis of difficulty-to-detect tumors. This study aims to determine if MACs are present in the histologically normal epithelial cells adjacent to HPV-positive oropharyngeal tumors. **Methods:** Biopsies of paired tumor and contralateral normal tissues were collected from each of nine HPV+ OPC patients as part of an ongoing clinical trial at VGH. Each biopsy was fixed, sectioned, and three areas of interest corresponding to the tumor (T), tumor-adjacent normal epithelium (AN), and contralateral normal epithelium (CLN), were outlined by the study pathologist. Slides were stained with Feulgen-thionin and a semi-automated quantitative imaging system was used to measure >100 nuclear features per cell. Features of T and CLN were used to build a Random Forest-based classifier capable of discriminating between these tissue types. Voting scores were extracted from the trained classifier, which classify nuclei on a continuous scale from zero ("normal-like") to one ("tumor-like"). **Results:** Our model showed an area under the ROC curve of 0.90 and classified 84.7% of 1207 tumor nuclei and 80.8% of 837 CLN nuclei correctly when applied to the test set. If AN nuclei do not contain MACs, then the distribution of features in AN tissues should be nearly identical to that of CLN, since they are derived from the same anatomical structure (surface epithelium of the oropharynx). However, of the top 10 most important features identified by our model (based on the mean decrease in accuracy), we identify four in which the AN is intermediate between the CLN and the tumor, and three in which the AN is statistically significantly different from the CLN but not the tumor. Furthermore, the distribution of voting scores of AN nuclei was intermediate between that of tumor and CLN for each of the nine patients analyzed, suggesting the presence of MACs. **Conclusions:** Our results suggest that histologically normal epithelial cells adjacent to HPV-positive oropharyngeal tumors contain reproducible changes in nuclear phenotype which could be used as biomarkers for the detection of early-stage HPV+ OPC.

A10 Oleksandr Butski, Otolaryngology
**Title:** Customized computer optimization of flap design for circumferential pharyngoesophageal reconstruction: a case series
**Authors:** Oleksandr Butski1, Vladimír G. Kim2, Scott Durant3, Donald W. Anderson4, Elton Prisant1
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**Background:** Circumferential resection at the pharyngoesophageal junction is often required for advanced malignancies of the hypopharynx, larynx, or cervical esophagus. The use of continuous free flaps folded into a tube is a popular method of reconstructing circumferential pharyngeal defects. Last year, our group described the use of customized software for modeling the cutaneous flap design for circumferential pharyngoesophageal reconstruction and presented the results of a cadaver study using this approach. Our software uses the dimensions of the circumferential defect measured intraoperatively as an input, and then predicts the two dimensional shape of the cutaneous flap that can be tubed into the desired proportions. Using the software, the shape of the free flap can be optimized to reduce donor site morbidity. **Objectives:** To report the results of the first clinical cases using the customized computer optimization of flap design for circumferential pharyngoesophageal reconstruction. **Methods:** We prospectively collected intraoperative and post-operative data of the patients who underwent circumferential pharyngeal reconstruction with the assistance of the customized software at the Vancouver General Hospital. Preoperative data consisted of dimensions and folding patterns of the cutaneous free flaps chosen by the surgeons. Post-operative data consisted of in-hospital complications and preliminary swallowing and speech outcomes. **Results:** Four consecutive patients who required anterolateral thigh free flap reconstruction underwent circumferential pharyngeal resection between August 2016 and August 2017. The dimensions of the defects varied in height, length and width. Software was used to customize the two dimensional shape of the flap for each patient, with the angle of folding ranging from 45° to 55°. All donor sites were closed primarily. Post-operatively, two patients developed fistulas which were closed with pectoralis major myofascial flap. Three of the four patients received a tracheoesophageal prosthesis and were able to initiate fluid intake while in hospital. **Conclusion:** We present the clinical results of the first method for virtually modeling circumferential pharyngoesophageal junction reconstruction. The method appears to be practical and efficient, potentially reducing donor site morbidity while ensuring accuracy of the reconstruction.

A11 Mitchell Allan Webb, General Surgery
**Title:** Open Abdomen in Liver Transplantation
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**Introduction:** Damage control laparotomy (DCL) with a temporary abdominal closure device is used for selective cases in trauma and acute care surgery. There is a discussion on how best to manage intra-operative hemorrhage and whether a role for DCL exists. **Objectives:** To examine the extent of peri-operative blood loss and blood product utilization in patients managed with DCL and vacuum-assisted closure (VAC) compared to those who are managed with primary abdominal closure (PAC) for orthotopic liver transplantation. **Methods:** Retrospective review of all adults undergoing deceased donor liver transplantation performed from 2007-2011 at a single center tertiary care institution. **Results:** 201 orthotopic deceased donor liver transplantations were performed. 34 cases required DCL with VAC, while 167 cases underwent PAC. Intra-operative blood loss (10.7L vs 4.4L, p < 0.001) and cell saver return (3998 vs 1399 ml, p<0.001), FFP (15.9 vs 7.6 units, p<0.001) and PLT requirements (18.3 vs 8.5 units, p<0.001), were significantly elevated in VAC compared to PAC. VAC patients also had significantly increased RBC, FFP, PLT, crystalloid, and colloid volume total requirements within the first 24 hours of ICU admission compared to PAC. 30 of the 167 PAC cases failed, which required re-laparotomy most commonly due to bleeding. **Conclusion:** In orthotopic liver transplantation, application of damage control surgery principles with a VAC device was utilized secondary to massive intra-operative exanguination. Further evaluation of our data is required to identify long-term morbidity and mortality in both groups.

A12 Peter Mankowski, Plastic Surgery
**Title:** Ensuring success after match: perceptions of attributes valued in plastic surgery residents
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**Background:** With their small program size and surplus of keen applicants, plastic surgery residency programs are faced with the difficult task of selecting their future program members within a highly competitive environment. To provide transparency and consistency between programs, many articles have been published documenting the applicant review process for a residency position and the characteristics most valued by plastic surgery programs. However, there is a lack of information on the attributes that academic plastic surgeons prize in their residents beyond the expectations documented in formal evaluations. **Objectives:** The purpose of this research is to determine which qualities are associated with the most valued and respected residents within plastic surgery training programs. **Methods:** A primary literature review was performed which identified 17 studies that highlighted attributes valued in medical students applying to plastic surgery and qualities associated with model residents. A total of ten positive and ten negative attributes were extracted from the literature review and used to construct a survey consisting both ranking and open-ended questions. After a trial and review period, the survey was disseminated at a quaternary plastic surgery department including staff and current residents. **Results:** We obtained a survey response rate of 64%. From the collected responses, a weighted ranking score for each evaluated attribute was obtained. The terms integrity, professional, and work ethic were viewed as the three most important positive attributes prized within residents. The terms dishonest, lack of dependability and unprofessional were valued most negatively by survey responders. Finally, the themes most frequently identified in the open-ended responses suggest that a commitment to patient centered care and exceptional work ethic are of particular importance. **Conclusions:** Ultimately, instilling the importance of integrity and professionalism while delivering patient centered care is most highly valued by members of the plastic surgery community within their surgical residents.
A13  Jonathan Hong, Cardiac Surgery

Title:  Staphylococcus aureus prevention strategies in cardiac surgery: a cost-effectiveness analysis

Jonathan C Hong, Monoj K Saraswat, Trevor Ellison, J Trent Magruder, Todd Crawford, Julia M Gardner, William V Padula PhD, Glenn J Whitman MD

Background: Cardiac surgery patients colonized with Staphylococcus aureus have a greater risk of surgical site infections (SSIs). The purpose of this study was to evaluate the cost-effectiveness of decolonization strategies to prevent SSIs. Methods: We compared 3 decolonization strategies: Universal Decolonization (UD), all patients treated; Targeted Decolonization (TD), only S. aureus carriers treated; and No Decolonization (ND). Decolonization included mupirocin, chlorhexidine, and vancomycin. We implemented a decision tree comparing the costs and quality-adjusted life years (QALYs) of these strategies on SSI over a 1-year period for patients undergoing coronary artery bypass (CABG) from a US health sector perspective. Deterministic and probabilistic sensitivity analyses were conducted to address the uncertainty in the parameters. Results: UD was the dominant strategy, since it resulted in reduced costs at near-equal QALYs compared to TD and ND. Compared to ND, UD decreased costs by $436 and increased QALYs by 0.004 per patient, while TD decreased costs by $292 and increased QALYs by 0.003 per patient. For 1000 patients, UD prevented 23 SSI while TD prevented 16 SSI compared to ND. Sensitivity analysis showed UD to be the most cost-effective strategy in more than 85% of simulations. For the 220,000 CABG procedures performed yearly in US, UD would save $96 million while TD would save $64 million compared to ND. Conclusion: Universal decolonization outperforms other strategies. However, the potential costs savings of $31.8 million per 220,000 CABG procedures comparing UD versus TD must be weighed against the potential risk of developing resistance associated with universal decolonization.

A14  Jeffery Tong, Otolaryngology

Title:  Incorporating patient choice and participation in the decision-making process of selecting a cochlear implant model

Jeffery Tong, Rochelle Galleto, Brian Westerberg, Jane Lea, Division of Otolaryngology – Head and Neck Surgery, Department of Surgery, University of British Columbia

Background: Multiple companies manufacture cochlear implants (CI) for patient use. The Cochlear Implant Clinic at St. Paul’s Hospital uses only one of four possible manufacturers; patients cannot choose a particular manufacturer during the decision process. Adding choice could potentiate patient anxiety. However, other centres offer choices to patients arguing there is high patient satisfaction with this model of decision-making. Objectives: 1) To gather and evaluate patient experiences with the current pre-operative cochlear implant decision process at our centre 2) To determine if patients would prefer to have a choice and to participate in the selection of the manufacturer of their cochlear implant. Methods: Thirty semi-structured qualitative one-on-one interviews were conducted to evaluate patient choice and preferences with regards to deciding on a particular cochlear implant manufacturer. Both pre-operative CI candidates and post-operative CI recipients were selected to participate. Transcripts of the interviews underwent qualitative analysis tools, including coding and thematic analysis. Results: Preliminary analysis suggests the majority of patients did not place much emphasis on the manufacturer or brand of cochlear implant they received or will receive, other than some aspects of the external components. Patients were mostly content to leave the decision making to the cochlear implant team. Conclusions: At this time, giving patients a choice in the selection of the manufacturer of their cochlear implant may not significantly improve patient satisfaction. Patients may feel more empowered selecting external components that matched their personal preferences and lifestyle.

A15  Jeffery Tong, Pediatric Surgery

Title:  The use of polydioxanone (PDS) plates for endoscopic skull base repair

Jeffery Tong, Andreana Butter, Terri MacDougall, Geoffrey K Blair; Division of Pediatric Surgery, Department of Surgery, University of British Columbia; Department of Surgery, Schulich School of Medicine & Dentistry, Western University

Background: Traditionally, medical students have used online feedback surveys to provide faculty feedback on their clerkship education. There is currently a lack of published evidence describing focus groups as a tool in this process. We recently have employed focus groups to facilitate the feedback process on their surgical clerkship. Objectives: 1) To determine the utility of focus groups as a method of obtaining feedback from students regarding their surgical clerkship experiences.

2) To explore the capacity of student focus groups as an independent tool to assist creating revisions to the surgical clerkship curriculum. Methods: Three annual focus groups were held consisting of 4 to 10 third-and-fourth year medical students and was facilitated by the Director of Undergraduate Surgical Education in the Department of Surgery at UBC. These students had completed their core surgery clerkship rotation and were asked to informally offer their opinions surrounding various aspects of the rotation including academic sessions, ward experiences, examination methods and future directions of the rotation. The content and depth of the quotes extracted from the focus groups were then compared to the feedback received through mandatory end-of-rotation surveys to evaluate the utility of focus groups in generating original content. In addition, our experiences were collaboratively combined with the conclusions of similarly structured student focus groups held by the Department of Surgery at the University of Western Ontario. Results: Focus groups were found to resonate with similar themes that were compiled through student online surveys. Focus groups also allowed for students to put forward, discuss and elaborate on ways that they felt could improve their surgical education that was not expressed through the online surveys. The focus groups allowed for bidirectional conversations where faculty and students comfortably exchanged ideas on proposed curriculum changes. Similar positive outcomes were achieved at the University of Western Ontario, where focus groups have been utilized for the past 15 years. Concrete changes to surgical curricula at both universities were borne of these focus group discussions. Conclusion: We believe this cost-effective concept can be applied to multiple-levels of medical education. We were able to demonstrate tangible changes to the surgical curriculum as a direct outcome of these focus groups. Focus groups offer a unique opportunity for students to directly voice their innovative and practical concepts which may otherwise be missed through other traditional means of obtaining feedback.
B01  Julie Pauwels, Otolaryngology

Title: Spontaneous resolution of ear lidding in newborns

Methods: 73 newborns (3% of the sample) were identified with lidding, 4 with bilateral and 7 with unilateral lidding. 10/11 newborns had spontaneous complete resolution of the lidding within an average 40.6 days of recruitment (range: 12-67 days). One newborn with bilateral lidding underwent molding splint treatment on both ears through parental choice, and achieved complete resolution in approximately 33 days.

Conclusions: Ear lidding was prevalent in newborns, but in this small cohort of closely-observed children, spontaneous resolution inevitably occurred within the first 3 months of life. Early cosmetic treatment for mild ear lidding may be unnecessary as cases may resolve on their own.

B02  Neil Chadha, Otolaryngology

Title: Increased Injury and subsequent health care utilization in a population based sample of children with hearing loss in the United States

Results: Hearing difficulty was reported in 0.6% of participants. In multivariable analyses, hearing difficulty was associated with a 76% increased incidence of injuries during the 1.3 year average follow up period (Incidence rate ratio 1.76, 95% CI 1.03-3.01, p=0.039). The association was most pronounced among children >12 years of age and from the lowest income families. The odds of emergency room attendance for injuries were two times higher for children with hearing loss in comparison to those with normal hearing (Odds Ratio 2.02, 95% CI 1.05 - 3.88, p=0.034). The association was not present in other healthcare settings.

Conclusions: This population-level study provides novel evidence that children with hearing loss are more susceptible to injury leading to increased healthcare usage. Further research is needed to understand the mechanisms underlying this association and whether hearing loss interventions reduce this risk.

B03  Richard Cook, Cardiac Surgery

Title: Complete Revascularization May Not Be Necessary In Patients Undergoing Robotically-Assisted MIDCAB

Methods: This was a retrospective review, including patients from May 2009 (1st RA-MIDCAB case at our institution) to August 2015 (to allow for 1 year follow-up). Preoperative factors were compared between the two groups using 2-tailed Student’s t-tests. Follow-up information was collected at least one year after each operation. Kaplan-Meier survival curves were used to compare survival between the 2 groups.

Results: The mean Society for Thoracic Surgery risk score for perioperative mortality was higher in the Hybrid group than the Non-Hybrid group (6.3 +/-2.0 vs 3.1 +/-1.8, respectively), however, there were no perioperative deaths. Only 1 patient (Hybrid group) had a major cerebrovascular accident post-operatively, and none of the patients had a wound infection. There was no significant difference in survival observed between the Hybrid and Non-Hybrid groups (Figure 1, log rank test p = 0.57).

Conclusions: Although the Hybrid group had a higher predicted risk of perioperative mortality, there was no significant difference in perioperative mortality, major complications, or survival observed between those patients, and the Non-Hybrid group. Our small experience suggests that in certain highly-selected patients with multi-vessel CAD, incomplete revascularization with RA-MIDCAB alone may be a reasonable and safe alternative to complete revascularization.

B04  Oliver Ayingl, Neurosurgery

Title: Suboccipital Decompressive Craniectomy for Cerebellar Infarction: A Systematic Review and Meta-Analysis

Background and Purpose: Suboccipital decompressive craniectomy (SDC) for cerebellar infarction has been traditionally performed without a strong level of clinical evidence. The aim of this systematic review and meta-analysis is to investigate the impact of SDC on functional outcomes, mortality, and adverse events in patients with cerebellar infaracts. Methods: We performed a systematic review and meta-analysis in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Our primary outcome was the proportion of patients with moderate-severe disability after SDC. Secondary outcomes included mortality and adverse events. A sensitivity analysis was conducted to examine the roles of age, pre-operative neurological status, external ventricular drain insertion (EVD), and debridement of infarcted tissue on SDC outcomes. Pooled event rates were calculated using the random effect model.

Results: Eleven studies (with 283 patients) met our inclusion criteria. The pooled event rate for moderate-severe disability was 28% (95% CI 20-37%) and for mortality was 20% (95% CI 12-31%). Among studies that reporting adverse events for SDC, the estimated overall rate was 23% (95% CI 14-35%). Sensitivity analysis found less mortality with mean age <60 years, higher rates of concomitant EVD-insertion, and debridement of infarcted tissue. Several factors were identified for heterogeneity between studies, including: follow-up time, outcomes scale, extent of infarction and other neuroimaging features.

Conclusions: The best available evidence for SDC is based on retrospective observational studies. SDC for cerebellar infarction is associated with better outcomes compared...
to decompressive surgery for hemispheric infarctions. Lack of standardized reporting methods for SDC is a considerable drawback to the development of a better critical and scientific understanding of the impact of this surgery on patient outcomes.

**B05**

**Oliver Ayling, Neurosurgery**

**Title:** Anemia after aneurysmal subarachnoid hemorrhage is associated with poor outcome and death

**Purpose:** Anemia after aneurysmal subarachnoid hemorrhage is common and potentially modifiable. We evaluated the effect of anemia on long-term neurological outcome and death and if transfusion of packed red blood cells affected outcome.

**Methods:** A post hoc analysis of the CONSCIOUS-1 study.

**Results:** In this cohort of 413 subjects anemia, defined as hemoglobin <10g/dL, was present in 5% of patients at presentation, in 29% of patients post-procedure (days 1-3), and in 32% of patients during the vasospasm period (days 5-9). On multivariate logistic regression, anemia post-procedurally (OR 0.67, 95% CI 0.063-1.28, p-0.03) and during the vasospasm window (OR 0.97, 95% CI 0.38-1.57, p=0.0014) were independently associated with poor neurological outcome. Anemia post-procedurally (OR 1.25, 95% CI 0.17-2.41, p=0.027) but not during the vasospasm window was an independent predictor of death. Propensity score matching demonstrated that transfusion of anemic patient did not improve long-term neurological outcome (p>0.8) or mortality rates (p>0.9), but transfusions in patients with a hemoglobin concentration >10 g/dL were associated with improved outcomes (p= 0.015, OR 0.09, 95% CI 0.002-0.72), but there were no differences in mortality.

**Conclusions:** Anemia after aneurysmal subarachnoid hemorrhage is associated with poor long-term neurological outcome and death. Transfusion of packed red blood cells is beneficial for patients with hemoglobin levels >10 g/dL but not for those with lower hemoglobin.

**B06**

**Kristin DeGirolamo, General Surgery**

**Title:** A Day in the Life of Emergency General Surgery in Canada: A Multicentre Observational Study

**Background:** Emergency general surgery (EGS) services are gaining popularity in Canada as systems-based approaches to surgical emergencies. Despite the high volume, acuity and complexity of the surgical patient served by EGS services, little has been reported about their structure, process, case mix and outcomes.

**Methods:** A national cross sectional study of EGS services was conducted simultaneously during a single 24-hour period on January 10, 2017 at 14 hospitals. Hospitals were recruited through the Canadian Association of General Surgeons Committee on Acute Care Surgery. Data outlining service structure, patient demographics, operative cases, consults, and admitted patients were analyzed.

**Results:** Services were staffed by 1-3 clinicians, with variable resident coverage. Most EGS services did not include trauma. 71% of sites had at least one half-day per week of protected operative time average. A total of 393 patient encounters occurred in the 24-hour period (48.4% operative, 51.6% non-operative; with a mean of 3.8 operations per service). The patient population was complex with 37% having greater than 3 comorbidities. There was a wide case mix including appendectomies (8%) and cholecystectomies (18%), as well as complex emergencies such as perforations (6%) and obstructions (14%).

**Conclusion:** Dedicated EGS services are well established across Canada. The characteristics and case mix are heterogeneous, but all services are provide comprehensive operative and non-operative care to complex, acutely ill patients with high levels of comorbidity. This study begins a national surveillance effort in EGS to define and advance surgical quality in an important and diverse surgical population.

**B07**

**Peter Yuanjie Zou, General Surgery**

**Title:** Autophagy and Lysosomal Function Protect Pancreatic β-Cells under Hypoxic Stress

**Methods:** Autophagy is a cell stress response where damaged organelles and protein aggregates are sequestered into autophagosomes and delivered to lysosomes for degradation. Autophagy is known to protect pancreatic insulin-secreting β-cells under lipotoxic stress. It remains an unanswered question if lysosomal function and autophagy are also important for β-cell viability under the hypoxic stress that contributes to β-cell failure and loss following pancreatic islet transplantation. **Objectives:** To determine 1) if impairment of autophagosome formation or lysosomal physiology affect β-cell function and survival under normoxic or hypoxic stress, and 2) if lysosomal dysregulation is a fundamental pathophysiological event in stressed β-cells. **Methods:** We deleted the essential autophagy gene Aut5 using adenovirus-mediated Cre expression in A5 mice islet cells. COCl2, Lysosomal distribution was assessed by LysoTracker staining and confocal microscopy. Lysosomal alkalization, and impairment of autophagic turnover, was achieved chemically using chloroquine (CHO) or Bafilomycin A1 (Baf-A1). Mitochondrial metabolism was quantified by recording cellular oxygen consumption rates (OCR). Gene expression was examined by quantitative real-time PCR. Cell death was tracked using fluorescence imaging of propidium iodide uptake. **Results:** Culture under 1% O2 significantly upregulated key genes related to hypoxia signaling, stress responses and autophagy in WT and Aut5 KO islet cells. Time-lapse recordings showed that loss of Aut5 markedly amplified hypoxia-induced cell death. Treatment with COCl2 reduced β-cell LysoTracker Red staining, suggesting a reduction in the number of lysosomes or severe disruption of mitochondrial homeostasis under chemical hypoxia-like conditions. Interestingly, this loss was accelerated in Aut5-deficient cells. To determine if lysosomal failure affects β-cell metabolism, we measured OCR in MIN6 β-cells that had been cultured 24 hrs in CHO (0.5, 1, and 5 mM) and Baf-A1 (1, 5, and 10 mM). Basal OCR in 3 mM glucose was not affected by pre-culture in Baf-A1 but was reduced by CHQ at higher concentrations. Both Baf-A1 (10 mM) and CHQ (5 µM and 10 µM) lowered the acute OCR response to 25 mM glucose. **Conclusion:** Our data reveal a protective role of autophagy in β-cells under hypoxic stress, and further suggest hypoxia may impair lysosomal homeostasis with possible consequences for β-cell metabolic function and survival.

**B08**

**Cathevine Yang, Cardiac Surgery**

**Title:** Incidence of Upper Extremity Deep Venous Thrombosis Following Laser Assisted Lead Extraction of Pacemaker and Implantable Cardiokerter Defibrillator Leads

**Objectives:** To assess for the incidence and risk factors of upper extremity DVT following lead extraction using ultrasound. **Methods:** This study included 47 consecutive patients undergoing laser-assisted lead extraction at St. Paul’s Hospital between December 2014 and November 2015. All patients received clinical follow-up and an ultrasound of their upper extremities to assess for the presence of DVT after laser assisted lead extraction. Patient demographic information, extraction procedural details, clinical follow-up, and post-extraction ultrasound results were collected. Primary endpoints examined were presence of DVT on ultrasound and arm swelling. Secondary endpoints included death, cardiac or vascular perforations, pulmonary embolism, and other complications. We employed a logistic regression model to identify the possible factors influencing the presence of DVTs. **Results:** DVT was present in 5 of 47 patients (10.6%, 95% CI [6-16.9]). One patient developed...
arm welling but did not have evidence of DVT upon ultrasound study. All patients were alive at the time of discharge and post-operative day 30. Larger laser sheath size (16 Fr versus 14 Fr) was found to be associated with a much higher risk of DVT [p=0.018, OR 12.2 95% CI [1.548 - 96.139]]. Length of lead implant in years was also found to be associated with higher risk of DVT [p=0.018, OR 1.2, 95% CI [1.035-1.425]]. **Conclusions:** The incidence of ultrasonographically evident DVT in the target vein post laser lead extraction was found to be higher than previously shown. Larger laser sheath size and longer lead dwelling time are both predictors of DVT in the target vein.

B09 Amin Javer, Otolaryngology
**Title:** A Prospective Randomized Controlled Trial Assessing Saline Nasal Irrigation Administration Methods Comparing Use of Multimedia Education Platforms and Offline Instruction Sheets

Amani Ansari, Shohini Muyaika, Katrin Samoy, Amin R. Javer, Division of Otolaryngology, University of British Columbia, St. Paul’s Sinus Centre, Vancouver, British Columbia, Canada

**Background:** Chronic rhinosinusitis (CRS) is a common condition affecting millions of North Americans. It has an estimated prevalence of 5% in the Canadian population. One treatment modality involves medical management using saline rinses, steroid sprays, or a combination. Prior to starting treatment, patients are educated on its use through a verbal discussion with the clinician and a printed instruction sheet listing the steps of preparation and administration. However, whether patients retain this information and administer the medication correctly is not known. Many factors contribute to this end result such as modality of teaching, patient education level, and frequency of repetition. With the increased utilization of technology in healthcare, new methods are introduced daily to advance patient care. One example includes Multimedia Education Platforms (MEP), a set of modules that incorporate visuals such as videos, images, sound, and even virtual reality to provide teaching to patients. MEPs have been studied extensively amongst patient populations with chronic diseases. Recent studies have shown increased patient preference for such platforms and improved clinical outcomes over traditional education methods like verbal discussions. Additionally, the use of multimedia platforms has shown to result in greater early-recall of information compared to traditional approaches.

In this study, we plan to introduce MEPs when prescribing sinus rinses to patients at the St. Paul’s Sinus Centre. **Objectives:** The goals of this study are to assess the efficacy of MEPs in improving medication administration methods using the Medication Administration Assessment Score (MAAS). Secondary measures will include patient satisfaction, information recall, and quality of life scores using various questionnaires. **Methods:** Target participants include those who are prescribed sinus rinses for the control of their sinus disease. Study subjects will be randomized into a control (instruction sheet) vs. a MEP arm (educational module in conjunction with an instruction sheet). The MEP arm will complete an online module consisting of a medication administration video following their clinic visit. All participants will be seen again at 6-weeks where they will demonstrate their medication administration and be assessed via the MAAS. They will also complete a questionnaire to test their delayed recall of information. A total sample of 60 patients is required.

**Discussion:** If this study successful, it will illustrate that evidence-based patient-independent learning can improve a patient’s medication administration skillset, satisfaction, and information recall. In a healthcare world where physician time is in high demand, supplementary teaching modalities need to be incorporated into patient care. Follow-ups to this study will include virtual reality environments, where patients can observe and perform a sequence of steps to administer a medication, or remove nasal packing from a virtual patient and receive direct feedback at the comfort of their own home.

B10 Ethan Newton, Otolaryngology
**Title:** The impact of surgical wait time on patient reported outcomes in sinus surgery for chronic rhinosinusitis

Ethan Newton1, Arif Janjua1, Ernest Laiz2, Guiping Liu3, Trofford Crump3, Jason M. Sutherland4 1University of British Columbia, Department of Surgery Division of Otolaryngology - Head and Neck Surgery, 2Centre for Health Services and Policy Research University of British Columbia, 3Department of Surgery University of Calgary, 4Centre for Health Services and Policy Research

**Background:** In many developed countries, wait times for elective surgery are increasing. Among these, Endoscopic Sinus Surgery (ESS) is performed for treatment of chronic rhinosinusitis (CRS). Little is known about the impact of increased wait times on patients’ surgical outcomes. The purpose of this study was to evaluate the association between patients’ surgical wait times and post-operative patient-reported outcomes. **Methods:** This study was based on a prospectively recruited longitudinal cohort of patients booked for ESS for the treatment of medically-refractory CRS in Vancouver, Canada. Patients were recruited between September 2012 and December 2016. All participants completed the sino-nasal outcome test (SNOT-22) pre-operatively and six months post-operatively. The primary outcome measure was participants’ change in SNOT-22 score following surgery. A multivariate regression model measured the association between patient-reported outcome, wait time and potential confounders. **Results:** The study included 150 participants. The mean surgical wait time was 32 weeks. The mean pre-operative SNOT-22 score was 40.0. The improvement in SNOT-22 scores following ESS was 18 points. Regression analysis found no association between wait time for ESS and the change in SNOT-22 scores after surgery (p = 0.42). Only pre-operative SNOT-22 score correlated with outcome scores. **Conclusions:** There was no association between the gains in health-related quality of life and the duration participants’ waited for surgery. The largest gains in health were concentrated among participants with the highest symptom burden, irrespective of wait time. This result suggests that it may be safe to triage patients based on symptom severity as a potential approach to maximizing the population’s overall health.

B11 Jasper Johar, General Surgery
**Title:** Older Differentiated Thyroid Cancer Patients Exhibit Increased Cancer Invasiveness And Nodal Metastases: A Possible Explanation For Their Worse Prognosis

Jasper Johar, BSc (Honors), 2Heidi Britton, BSc (Honors), 3Kadi Liu, BKin2, Sam M. Wiseman, MD, FRCSC2, 1Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada 2Department of Surgery, St. Paul’s Hospital & University of British Columbia

**Introduction:** Differentiated thyroid cancers (DTC) have been established to carry worse prognoses with advanced age. Several staging systems have been established worldwide that use age in the staging of thyroid cancer. These include MACIS (metastasis, age, completeness of surgical resection or removal of the tumor, invasion, and size), AMES (age, metastasis, extent of disease, and size), and the American Joint Committee on Cancer (AJCC) TNM (tumor, node, metastasis) staging system which uses a cutoff of 45 years of age. Although the association of more aggressive DTC with advanced age has been well documented in the literature, there is currently no proposed mechanism to explain these poorer outcomes.

**Objectives:** The objective of this study was to investigate the clinicopathological variables that underlie observed age-related differences in DTC behavior, and may have the potential to improve the tailoring of surgical treatment and adjuvant therapy. **Methods:** Medical records from 941 sequential DTC patients who underwent thyroid surgery at a tertiary care Endocrine Surgical Center (St. Paul’s Hospital, Vancouver, BC, Canada) between January 2005 and August 2017 were reviewed. DTC patient sex and pathological characteristics (cancer size, follicular, extra-thyroidal cancer extension (ETE), vascular invasion, histological subtype, completeness of cancer resection), and presence (LNM) and extent of nodal or distant metastases, were evaluated for their relationship with patient age. A multivariate analysis of variance (using JMP 13.0 and R 2.12.0) was performed for dichotomous (gender, extra-thyroidal extension, multifocality, and vascular invasion), trichotomous (lymph node metastasis) and continuous (tumor size) variables. **Results:** After exclusion of cases with incomplete data and papillary microcarcinomas, which generally are incidentally diagnosed and have an excellent prognosis, 622 patients made up the final study population. In the study population patient age was normally distributed (mean 47.0, 1st quartile 37.0 and 3rd quartile 57.0), and the mean age of women was 46.9 years and 50.2 years for men. The correlations between mean age and ETE (P<10^-5), LNM (P<10^-5), and sex (P=0.028) were statistically significant. After splitting the study population into four age groups according to the mean age distribution and quartiles (<37, 37-47, 48-57, and >57 years of age), the correlation between mean age and LNM was significant (P=0.011) in the 48-57 age group, and the correlation between mean age and ETE was significant (P=0.0024) in the over 57 age group. **Conclusions:** The worse prognosis observed in older DTC patients is due to increased cancer invasiveness (ETE) and metastatic behavior (LNM). Further study of the underlying molecular basis for these differences is important, and could lead to more tailored treatment, and improved outcomes for this common malignancy.
B12 Amandeep Ghuman, General Surgery
Title: Urinary Retention In Early Foley Catheter Removal After Colorectal Surgery

Introduction: Prolonged catheterization causes increased urinary tract infections (UTIs), but early removal after surgery can lead to urinary retention. We began removing the Foley on postoperative day 2. The aim of this study is to determine the incidence of urinary retention and infection and potential risk factors.

Methods: Single academic center retrospective cohort study with male patients 50+ years old undergoing elective colorectal surgery from January 2015-February 2017. Females, prior prostate surgery, tumor extension to bladder or prostate and/or intraoperative bladder or bladder injury were excluded. As of 2016 prophylactic Tamsulosin 0.4mg daily was given three days before surgery and continued until discharge. A multivariate regression analysis was performed to determine potential risk factors for urinary retention including age, neoadjuvant chemoradiation, history of voiding difficulty, MIS vs. Open, lesion location, operative time, ASA, intra operative fluid balance, epidural, PCA, anastomotic leak, ileus and prophylactic Tamsulosin use.

Results: 118 patients were included in the analysis, 62 without and 56 with prophylactic Tamsulosin. Urinary retention rate was 12.71% and UTI rate 5.13%. Operative duration and ileus were found to be independent risk factors for urinary retention with adjusted odds ratio of 1.02 [95%CI: 1.01, 1.03], p<0.01 and 4.96 [95%CI: 1.45, 16.94], p<0.01 respectively. There was no significant association with the other variables. Discussion: Urinary retention was associated with operative duration and ileus, which could potentially be explained by more difficult cases. Urinary retention was not associated with rectal lesions or prophylactic Tamsulosin. However, sample size is small and further investigation is warranted.

B13 Paula Tellez, Otolaryngology
Title: Why patients referred for Cochlear Implant Assessment ultimately do not received an implant: Who said no to whom?
Paula A. Tellez, Ruth Chia, Frederik K. Kozak, Julie Pouwels

Introduction: Not all patients referred for cochlear implant assessment ultimately received one. There are multifactorial reasons for this, including declining by the Cochlear Implant Team (CIT) or that the patient/family don’t want to proceed with the proposed treatment. Objectives: Review the past eight years of referrals to our Pediatric Cochlear Implant Team and establish why patients did not receive an implant. Methods: Medical charts of patients referred to the Cochlear Implant Team (CIT) at British Columbia Children’s Hospital between April 1, 2007 and March 31, 2015 were reviewed. Information regarding source of referral, age, gender, type and severity of hearing loss, etiology, comorbidities and family history of hearing loss were obtained. Number of patients turned down by the CIT was recorded along with number of patients/families who refused to cochlear implant and the reasons for both were tabulated. Results: 241 patients were referred to the CIT over the 8 years of the study and 224 of those charts could be reviewed and included in our study. 58% (131) were male and 42% (93) female. The average age of referral was 5 years (range from 1 month to 18 years) and was mainly referred by audiologist (57%). 141 patients (63%) went to implantation and 83 (37%) were not implanted. 59 of these 83 patients (71%) were declined by the CIT. The main reasons why the CIT declined implantation or considered the patient wasn’t a good candidate were: significant benefit with hearing aids (23%), absence of bilateral cochlear nerves (19%), too much residual hearing (19%), length of auditory deprivation (12%), age (6%), among others. The remaining 24 patients (29%) who were not implanted were due to patient’s or family preferences. The principal reasons why patient/family decided not to proceed with cochlear implant were because they considered the patient had “enough” residual hearing (19%), they preferred the use of hearing aids (38%) or family history of hearing loss and desire of learning sign language (24%). Conclusions: Reasons why patients who are referred to the Pediatric Cochlear Implant Team and not receiving an implant are diverse. The two main reasons for being rejected by the team were too much residual hearing or good benefit with hearing aids, and the absence of bilateral cochlear nerves. The main reasons why parents/families elected not to pursued implantation were the perception of enough hearing and the desire of using hearing aids.

B14 Andrew Amenyogbe, Otolaryngology
Title: Noise in the operating rooms of BC Children's Hospital
Andrew Amenyogbe, Frederik Kozak, Julie Pouwels, and Alice Liu, Division of Pediatric Otolaryngology, Head & Neck Surgery, BC Children’s Hospital

Background: Noise in the operating room (OR) is a topic of particular interest within the medical community. Concerns are both immediate, regarding the necessity of clear speech communication during surgery, and long term, regarding the potential of negative effects on hearing of OR personnel that accumulate over time. Nurses, surgeons and anesthesiologists who work in noisy operating rooms have been categorized as being susceptible to noise induced-hearing loss. Recently several review articles have proposed that OR noise levels can reach peaks above 120dB. Nonetheless, there is a lack of consensus in the literature in regards to whether noise levels experienced in the OR exceed exposure limits. Objectives: The purpose of this study was to quantify operating room noise exposure across the specialties of Neurosurgery, Otolaryngology, and Orthopedics; and further, establish whether harmful noise peaks (≥120 dB) occur. In addition, this study also investigated the operating room staff’s perception of noise levels and difficulties in communication during the procedures.

Methods: Noise levels were measured across the specialties of neurosurgery, otolaryngology and orthopedics. OR personnel were outfitted with a dosimeter that captured noise exposure before, during and after surgery. To qualify the acoustical events during surgical procedures, a video recorder monitored the surgery for later review of what caused the noise peaks. The data was analyzed to determine background sound levels, average equivalent sound levels, frequency distribution, and peak sound pressure levels. Results are presented in dBA, or in the case of peak levels, unweighted dB values. The surgical team’s perspective on noise levels was assessed using a brief anonymous questionnaire after the dosimeter was removed. Each specialty was recorded 3 times to investigate variability.

Results: Noise exposure levels did not exceed recommended limits of 85 dBA; however, transient peak sound levels approached and exceeded maximums of 120 dB on multiple occasions during surgery. There were conflicting survey responses regarding the level of noise experienced and whether this posed difficulties in communication during the procedures.

Conclusions: Surgery is noisy work. Although overall total noise dose during surgery was acceptable, the presence of significant sound pressure peaks of great intensity is a cause for concern. There are numerous implications of these high sound pressure levels: including the significant, but unquantified risk for noise-induced hearing loss, and obstruction of clear communication. All the surgical divisions monitored experienced sound pressure peaks that either approached or exceeded 120 dB; it is possible that these very high sound pressure peaks could negatively impact the hearing of surgical staff over time.

B15 Daniel Ben Lustig, General Surgery
Title: Is Microductectomy Still Necessary For Breast Cancer Diagnosis?
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Introduction: Spontaneous nipple discharge (SND) accounts for 10% of breast specialist referrals and is thought to be due to malignancy in up to 12% of cases. Patients with SND who have neither palpable masses nor evidence of disease on imaging have traditionally been investigated with galactogram and duct excision to prevent missing a diagnosis of cancer. As imaging diagnosis has improved it has raised the question of how frequently breast cancer is diagnosed following microductectomy and whether the procedure remains necessary. The aim of this study was to determine the incidence of malignancy in women presenting with SND who underwent microductectomy after initial clinical and radiological evaluation were inconclusive. Methods: A retrospective chart review was conducted for patients referred to the Providence Health Care Breast Centre for SND between 2009-2016. All patients who underwent microductectomy for SND were included in our study and their pathology reports were examined to determine the incidence of malignancy. Results: 219 microductectomies were performed for women presenting with SND whose clinical and radiological work up was negative for abnormalities. Breast cancer
was identified in 13% of patients: 3% invasive carcinoma (n=6) and 10% carcinoma-in-situ (n=22). The majority of women had benign pathology including intraductal papilloma 54% (n=119), duct ectasia 10% (n=21) or other (normal/inflammatory/hyperplasia) representing 23% (n=50) of cases. **Conclusion:**

At our center malignancies were detected in 13% of women who underwent a microductectomy procedure after their initial clinical and radiological evaluation for SND were inconclusive. Therefore, patients with SND should continue to be evaluated with microductectomy to guide further management and prevent missed cancers.
GelDerm holds a great promise in managing chronic and acute injuries caused by trauma, surgery, or diabetes. The proposed

Conclusions: Here, we provide evidence that BiocellTM implants are explanted sooner and more frequently for reasons related to implant performance failure. A larger proportion of BiocellTM implants had late seromas, compared to three late seromas with any other implant type (p-value = 0.0013).

C02  Victoria McCutcheon, Pediatric Surgery

Title: Paediatric Elbow Fractures from a Child’s Viewpoint: A mixed-methods study

Victoria McCutcheon,2, Harpreet Chhina,1, Ian Pikes,1 Mariana Brussoni,3, Damian Duffy,5 Anthony Cooper,1,2,5 1 Faculty of Medicine, University of British Columbia. 2 Department of Orthopedics, BC Children’s Hospital. 3 BC Injury Research and Prevention Unit, Department of Paediatrics, BC Children’s Hospital. 4 The School of Population and Public Health, University of British Columbia. 5 Department of Paediatric Surgery, BC Children’s Hospital

Introduction and Background: Supracondylar fractures of the humerus (SCH) are the most common fractures sustained following a fall among children. The majority of these fractures are mild, but the most severe injury mechanisms can result in a disruption to the nerves and blood supply resulting in limb threatening injuries and potential life-long disability. Better understanding of injury mechanisms and injury-related factors that influence injury, especially for severe cases, is crucial to identifying best practices and informing policy. Objectives: Stratify fractures and examine the associated mechanisms and circumstances of injury to identify best practices and inform supportive policy. In doing so, we plan to investigate why some children sustain more severe fractures than others by exploring mechanisms and locations of injury, risk-taking behaviours, and bone density. Methods: A prospective, mixed-methods pilot study. Our approach links narratives from qualitative photo elicitation interviews (PEI) to mapped images of the locations of injury using geo-tagged photographs children have taken themselves. Quantitative data includes incidence and classification of SCH fracture severities, as well as treatments and outcomes to ultimately identify those at risk of longterm or irreversible complications. Results: Screening and recruitment are underway with 15 patients currently recruited. We aim to recruit and interview 30-50 participants for the pilot portion of our data. Conclusions: We are exploring why some children sustain more severe fractures than others using their viewpoints of their injury. We are investigating for potentially modifiable and non-modifiable risk factors, including clinical injury data, risk-taking behaviours, and measurements of the locations of injury, to give a measurable view of the patient population and support an enriched view of injury. This is a unique multidisciplinary team collaboration between the Department of Orthopaedics, the School of Population and Public Health, the BC Injury Research and Prevention Unit, and the Office for Paediatric Surgical Evaluation and Innovation, aiming to develop translational knowledge that can be shared with clinicians, patients/care-givers, community-based health teams, and local policy makers to make timely and impactful improvements.

C03  Mohsen Akbari, Plastic Surgery

Title: Advanced Multifunctional Hydrogel-Based Dressing for Wound Monitoring

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Background: Wound infection is a major clinical challenge as wound infections result in significantly longer hospitalization, delayed wound healing, and increased cost and mortality. An infection can lead to the development of a pronounced immune response, accompanied by sepsis or septic shock, which results in hypotension and multiorgan failure. Therefore, the prevention and management of infections, accompanied by continuous monitoring of the wound, are primary concerns of patients dealing with non-healing or traumatic injuries. Objectives: The overarching goal of this work was to develop a multifunctional hydrogel-based dressing (GelDerm) capable of colorimetric measurement of pH as an indicator of bacterial infection and releasing antibiotics to wound site. Methods: We used 3D bioprinting to fabricate and array of colorimetric pH sensors and drug eluting meshes in an alginate-based dressing. We demonstrate the ability of GelDerm to detect bacterial infections using in vitro and ex vivo tests with accuracies comparable to the commercially available systems. Additionally, the dressing was integrated within commercially-available patches and can be placed on the wound without chemical or physical irritation. We demonstrated the ability of GelDerm to eradicate bacteria by the sustained release of antibiotics. Results: The functionality of the developed dressing in detecting bacterial infection was evaluated via an ex-vivo test on pig skin samples, infected by Pseudomonas aeruginosa, and the presence of bacteria was detected within 30 minutes after the placement of the dressings on the skin samples. Moreover, the inclusion of gentamicin-loaded components into the wound dressing facilitated the inhibition of bacterial growth, which was evaluated in vitro on the same strain of bacteria. In this experiment, 2 mg/ml of gentamicin in the hydrogel led to the eradication of P. aeruginosa. This incorporation of antibiotic delivery along with the simple colourimetric infection detection holds a great promise for managing acute and chronic wounds by inhibition of bacterial growth and monitoring infection in real-time without a need for dressing removal. Conclusions: GelDerm holds a great promise in managing chronic and acute injuries caused by trauma, surgery, or diabetes. The proposed engineered dressing offers several advantages over existing technologies including the ability to (1) map the pH of the wound using an array of printed sensors, (2) deliver antibacterial agents at the wound site, which prevents adverse side effects of systemic drug delivery, (3) maintain the wound moisture using a hydrogel substrate, and (4) provide conformal coverage to the wound area. Additionally, the dressing can be integrated within commercially-available packages and can be placed on the wound without chemical or physical irritation.

C04  Matthew Chan, Radiation Oncology

Title: Correlating pre-treatment white matter hyperintensity on magnetic resonance imaging and cognitive function after volumetric radiosurgery and whole brain radiotherapy

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Background: Cerebral white matter hyperintensity (WMH) on magnetic resonance imaging (MRI) has been associated with various geriatric disorders including cognitive impairment in the elderly and ischemic brain injury. Whole brain radiotherapy (WBRT) can also cause cognitive impairment resembling dementia.

Objective: our study aim was to assess the impact of pre-treatment WMH on follow-up cognitive testing after volumetric radiosurgery and WBRT in patients with brain metastases enrolled in the WHAM! clinical trial. Methods: 43 out of 60 patients accrued in the WHAM! trial had suitable pre-treatment MRIs and serial Mini-Mental State Examinations (MMSE) after volumetric radiosurgery and WBRT. Deep WMH and periventricular WMH were contoured on T2-weighted
fluid attenuation inverse recovery (FLAIR) images for 42 patients and on T1-weighted rapid three-dimensional gradient-echo technique (MP-RAGE) images for 1 patient. Patients with deep WMH ≥2 cm³ and periventricular WMH ≤3 cm³ were categorized into a minimal/no WMH group while those exceeding either of those thresholds were categorized into a significant WMH group. Patients were censored at the time of radionecrosis or progression of brain metastasis. Descriptive statistics and logistic regression modeling was used to test for association between WMH and MMSE scores. Results: 24 patients were categorized into the minimal/no WMH group and 19 patients into the significant WMH group. The magnitude in drop in MMSE score from baseline to last cognitive testing date correlated with higher WMH volume (median difference 1 versus 0 points for minimal/no WMH versus significant WMH). The difference in MMSE score between baseline and the lowest score at any time point also correlated with higher WMH volume (median difference 2 versus 1 points). Using logistic regression modeling, a statistically non-significant increased risk of MMSE decline was associated with the presence of WMH (OR 2.17; 95% CI 0.62 - 7.6; p=0.23). Conclusion: A statistically non-significant increased risk of cognitive decline was associated with the presence of pre-treatment WMH after volumetric radiosurgery and WBRT.

C05

Leslie Leung, Plastic Surgery

Title: A Cross-Sectional Analysis of the Cleft Palate-Craniofacial Waitlist

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Background: Cleft Palate Cranio-facial Program (CPC) at BCCH is a multidisciplinary team of specialists. It consists of the Cleft Palate Clinic, the Craniofacial Clinic, and the Jaw Clinic. The program aims to individualize treatment plans based on the current standards of American Cleft Palate Craniofacial Association (ACPA). According to the ACPA, patients need to see certain specialists at different stages for optimal care. Objectives: To describe the patients on the CPC waitlist as of November 1, 2016 according to diagnosis, age, and wait-times, to analyze the missed clinical assessments. To characterize patient care needs according to Medical Complexity, Specialized Speech Services, Vulnerability, and Distance from CPC. To define the tier of care for the study population.

Methods: This was a retrospective cross-sectional study of the BCCH CPC wait list as of November 1, 2016. Data including demographics, medical and social histories, CPC recommended appointment times, specialists, & assessments were collected. We then analysed the patients’ sex, age, diagnosis, geographic location, and median wait times. We further objectively analyzed their care needs based on Complexity (number of specialists seen), Speech (degree of speech intervention required), Vulnerability (degree of social work or ministry involvement), and Distance from CPC. Tier of care was assigned based on care needs in the primary, community, regional, or provincial level. Results: We identified 576 patients from the CPC waitlist with complete data. Most of the patients were non-syndromic cleft patients, representing 62.6% of the study population. Overall, 28.9% patients were syndromic. The mean additional wait times for cleft and craniofacial patients were 10 months and 1.4 years respectively. During this additional waiting period, 7.8% of all patients missed plastic surgery assessment; 20.8% missed orthodontic assessment; 61.6% missed speech assessment. Most patients were recommended to see 3-4 specialists. 38% of all patients required speech assessment, with an additional 5% requiring procedural assessment. 1/3 of patients had some concerns requiring a social worker’s attention. 40% of all patients were outside of the Greater Vancouver Regional District. 91.3% of patients required level 4 tier of care at the provincial level.

Conclusions: A significant number of patients had missed plastic surgery, orthodontics, and speech assessments during the additional waiting period. The majority of them required provincial level of care. Additional resources are needed to address their care needs.

C06

Sonja Catherine Murchison, Radiation Oncology

Title: Subventricular Zone Dose and Outcome In A Large Cohort Of Glioblastoma Multiforme Treated With Surgery and Concurrent Chemoradiotherapy Between 2006-2012

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Background: Stem cells residing in the subventricular zone (SVZ) may contribute to the aggressiveness of Glioblastoma Multiforme (GBM). Objective: This study investigated the relationship of SVZ dose outcome and in a large GBM cohort treated with surgery and chemoradiotherapy (CRT). Methods: Patients completing radical CRT between 2006 – 2012 (n=360) were identified. Clinical data was extracted from electronic medical records. SVZ was contoured from planning CT data with MR registration where available, and dose was extracted from dose volume histograms. Outcomes including progression-free survival (PFS), and overall survival (OS), were assessed for known prognostic factors, and for different SVZ doses. Results: Of the 360 patients assessed, most were older, with good performance status. Rates of gross total resection (GTR), subtotal resection (STR), and biopsy were 48.1%, 37.5%, and 14.4%, respectively. Median PFS for the entire cohort was 271 days (95% CI, 252-298 days), and OS 502 days (95% CI, 462-535 days). PFS was significantly associated with age (P=0.045), KPS (P=0.049), multifocality (P <0.001), and adjuvant chemotherapy (P <0.001). OS was associated with KPS (P=0.001), extent of resection (P<0.003), multifocality (P=0.009), and adjuvant chemotherapy (P=0.001). Dose was not associated with outcome for any of the dose levels assessed, even in a separate analysis of patients with GTR. In multivariate analysis, multifocality independently predicted worse PFS (P <0.01) and poor performance (P <0.01) and biopsy only (P <0.01) independently predicted worse OS. Conclusions: For a large cohort of GBM treated with surgery and long course CRT, SVZ dose does not correlate with outcome.

C07

Ameen Amanian, Otolaryngology

Title: Mastoid Pressure Dressing Usage Following Cochlear Implant Surgery - Challenging the Practice Patterns Amongst Canadian Pediatric Otolaryngologists

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Background: Historically, in Otolaryngology, Mastoid Pressure Dressing (MPD) has been routinely used following major ear surgery (such as cochlear implantation) to reduce postoperative wound complications, including bleeding and hematoma. This entails wrapping a bandage around a patient’s head covering the ear and mastoid area after surgery is completed, applying firm pressure, typically overnight. To date, controlled studies have suggested no difference in the incidence of postoperative dressing management after cochlear implantation and the factors in this decision-making process for post-surgical care amongst Canadian Pediatric Otolaryngologists. Methods: The Otolaryngologists who perform the vast majority of pediatric cochlear implant (CI) surgery in Canada were identified (n=18) and contacted via email to complete a short online questionnaire regarding current post-operative head dressing practice following CI surgery. Descriptive statistics were used to analyze the response data. Results: 100% of the recipients completed the survey. 376 cases of CI were completed in 2016 with an average of 21 cases per surgeon. 61% of the surgeons surveyed routinely used MPDs following CI surgery justified by reasons such as perceived wound protection, standard of care, and physician’s original training practice. Of note, decisions to admit patients overnight included patient age, behavioral complications, parental preference, and time of operation. Conclusion: There is no clear consensus on the use of MPDs amongst centers and reasons for MPD use appeared mainly based on previous training and preference, and hospital standards. Since the current evidence in the literature suggests no difference in wound complication incidence post-surgery when an MPD is used, a change in this historical pattern of practice may be justified. Further prospective controlled studies may be warranted.

C08

Kevin Nickel, Plastic Surgery

Title: Tissue Expansion for Equinovarus Deformity: A 16-Year Review

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Background: Tissue expansion in the lower extremity is controversial, with studies reporting a complication rate as high as 83%. In the few studies that have looked at tissue expansion prior to equinovarus deformity correction, rates of wound complications in children are unacceptably high and there are no adult cases published to date. Here we report the largest case series on the use of tissue expanders for the reconstruction of equinovarus deformity, and the only report in adults. Objectives: 1. Describe the risks associated with lower extremity tissue expansion for equinovarus deformity in the adult population.
2. Appreciate that lower extremity tissue expansion is a useful technique to minimize wound complications for orthopedic correction of equinovarus deformity in the adult population. Methods: This is a retrospective chart review of the senior author’s practice over a 16-year study period. All patients over 18 years of age who underwent tissue expansion prior to definitive orthopedic correction of equinovarus deformity were included. Patient demographics, etiology of equinovarus deformity, rate of expansion, and complications were recorded. Major complications were defined as a premature loss of expander leading to a delay in, or abortion of, orthopedic correction. Data was analyzed using descriptive statistics. Results: 19 cases were performed on 16 patients. Our overall complication rate was 31.6% (6/19), with major complications occurring in 21.1% (4/19) of cases, and minor complications occurring in 10.5% (2/19) of cases. Despite this, 94.7% (18/19) of cases went on to receive definitive orthopedic correction (91%) of tissue expansion. Conclusions: Here we present the first report of tissue expansion for the correction of equinovarus deformity in the adult population. Our overall complication rate of 31.6% compares favourably with that reported in the literature, and 94.7% of cases went on to definitive orthopedic reconstruction.

CO9 Joshua Gurberg, Otolaryngology
Title: Safety of Long Term Budesonide- Impregnated Topical Nasal Saline Irrigation for the Treatment of Chronic Rhinosinusitis
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Background: Chronic rhinosinusitis is a chronic inflammatory disease of the mucosal lining of the nose and the paranasal sinuses. Increasingly over the last decade, Rhinologists have been adding liquid budesonide ampules to nasal saline rinses as a novel topical therapy for patients with CRS. Prior safety studies of budesonide-impregnated irrigations have employed a small number of patients or included a short follow-up period. Objectives: Further elucidate the long-term safety profile of budesonide-impregnated nasal saline irrigations in a larger cohort of patients with chronic inflammatory sinus disease. Methods: Patients receiving once or twice daily budesonide-impregnated nasal saline irrigations for at least 4 months were screened for symptoms of HPA axis suppression and underwent AM serum cortisol testing. Characteristics of patients with and without evidence of HPA axis suppression were compared retrospectively. Results: 69 total patients were reviewed. 87% of patients experienced subjective improvement in their sinonasal symptoms. 2 of the 69 patients (3%) had depressed AM serum cortisol levels on screening bloodwork. Both were treated with 0.5 mg doses of budesonide in nasal saline rinse twice daily for at least 36 months. Both concurrently used a nasal steroid spray and had received oral prednisone over the course of the study, but not within 3 months of AM serum cortisol testing. One of these patients was asymptomatic and one experienced hypertension and sleep disturbance. Conclusion: This study is the largest to date evaluating the safety of budesonide-impregnated saline nasal nasal irrigations. Taken together with the current literature, our results suggest that this widely practiced intervention is safe and effective. Clinicians should consider evaluating for subclinical HPA axis suppression when treatment is prolonged (greater than 36 months in this study) or accompanied by other corticosteroid containing medications.

C10 Joshua Gurberg, Otolaryngology
Title: The efficacy of Treatment for Idiopathic Sudden Sensorineural Hearing Loss – The Vancouver General Hospital Experience
Joshua Gurberg BS, MDCM, John Lee BS, MSc, Lisa Ying BS, and Desmond A. Nunez MBBS MD FRCS(ORL) FRCS Division of Otolaryngology – Head and Neck Surgery, Vancouver General Hospital, University of British Columbia
Background: Hearing loss can affect all age groups and have significant socio-economic consequences. Idiopathic sudden sensorineural hearing loss (SSNHL) is an unexplained form of acute sensorineural hearing loss that develops over less than 72 hours. The primary treatments for idiopathic SSNHL include hyperbaric oxygen therapy (HBO) and oral as well as intratympanic corticosteroids. There have been no large series comparing the outcomes of these three treatments in Canada. Objectives: Assess the effect of different SSNHL treatment regimens on hearing outcome in patients presenting to Vancouver General Hospital from 2013-2015. Methods: Retrospective chart review of consecutive cases. Results: 87 patients were identified with SSNHL over 3 years. 50 patients had complete documentation, met inclusion criteria, and were included in the analysis. Average patient age was 55 (56% male and 44% female). 18% of patients smoked, 18% consumed alcohol, 14% had diabetes, 12% had dyslipidemia, and 32% presented with vertigo. Average pure tone average (PTA) on presentation in the affected ear was 68dB. Vertigo at the time of presentation correlated with the severity of hearing loss (Chi-squared, p<0.005). 2% of patients refused treatment, 2% were treated with HBO, 26% were treated with oral prednisone, 28% were treated with oral and intra-tympanic steroids, 16% were treated with oral prednisone and HBO, while 24% were treated with all three modalities. There was no statistically significant difference in the median post-treatment PTA change between treatment regimens (Kruskal-Wallis, P>0.05). Average PTA improvement was 22db (maximum: 76db, minimum: -33db). 58% of patients achieved significant improvement (>15dB PTA decrease), 6% significantly worsened (> 15dB PTA increase) and 36% were unchanged post-treatment. 20% of patients achieved complete recovery, while 10% progressed to profound hearing loss (>90dB). Conclusion: In this study of patients presenting with SSNHL to a single Canadian referral center, the majority of patients had a severe loss. Regardless of treatment modality, 20% of patients were able to regain normal hearing. Larger numbers will help to validate these findings.

C11 Katherine N. MacDonald, General Surgery
Title: Effect of cytokines on thymus-derived regulatory T cell expansion
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Introduction: Regulatory T cells (Treg)-based therapy is a promising approach to treat immune-mediated diseases such as autoimmune disorders, organ graft rejection, and graft-versus-host disease. Challenges for the successful implementation of Treg therapy include the difficulty in isolating and expanding sufficiently pure cells. We have previously found that the thymus, routinely removed during pediatric cardiac surgery, is a plentiful source of Tregs that can be easily isolated. However, current protocols for in vitro Treg expansion are directly derived from protocols that were originally developed for conventional T cells. There is an opportunity for systematic investigation of how cytokines, nutrients and oxygen conditions can be optimized for maximal Treg expansion.
Objective: To determine new human Treg culture conditions to increase cell yield, without loss of phenotype or function. Methods: Thymic Tregs were expanded for 14 days using anti-CD3/CD28 antibody tetramers. Two-level factorial experimental designs were used to investigate the individual and combined effects on Treg expansion and FOXP3 expression of IL-2, IL-7 and IL-15, as well as IL-2, IL-6, IL-12 and TNF-α. Results: When the effects of IL-2, IL-7 and IL-15 were tested, IL-2 was observed to have a positive effect on fold expansion and a negative effect on FOXP3 expression. IL-7 and IL-15 did not have a significant effect on fold expansion or FOXP3 expression. When the effects of IL-2, IL-6, IL-12 and TNF-α were tested, IL-2 and IL-6 were both significant on thymic Treg expansion. IL-2 enhanced thymic Treg expansion. IL-12 was observed to have a negative effect on thymic Treg expansion at high concentrations and there was a negative interaction between increasing IL-2 and IL-12 concentrations. IL-6 or TNF-α did not have a significant effect on the expansion or FOXP3 expression. Conclusions: The human thymus provides a plentiful source of homogeneous Tregs, allowing multiple culture conditions to be tested from a single donor. This type of experimental design will be used to test other cytokines that have been shown to stimulate Treg proliferation but have not yet been explored for use in clinical expansion protocols.

C12 Kimberly Chang, Radiation Oncology
Title: Questioning the Quality of Online Thyroid Cancer Information
Background: Thyroid cancer is amongst the most common malignancies in North American young adults. As such, many thyroid cancer patients likely use the internet to seek information. Objectives: This project aims to evaluate the quality of online information for thyroid cancer patients. Methods: The search term “thyroid cancer” was entered into Google and meta-search engines Yippy and Dogpile. Inclusion and exclusion criteria were used to create a list of the top 100 websites with thyroid cancer patient information. A previously-validated structured rating tool was used to assess sites’ currency, disclosure, attribution and content. Two reviewers independently coded sites, and results were used to ensure maximum inter-rater reliability. Results: A search for “thyroid cancer” returned 4,760,000 hits on Google, 610,759 on Yippy, and an undisclosed number on Dogpile. Only 26% of the top 100 sites named the authors, and 56% cited sources. 18% contained significant bias. While only 41% provided the date of the most recent update, of those, 90% (36 sites) had been updated within two years. Based on the Flesch-Kincaid Grade Level, 98% of websites required at least high school education for comprehension. With respect to content, a definition was most often present, on 94% of sites, followed by treatment options (93%) and diagnostic work-up (92%). Less commonly covered topics were prevention (37%) or incidence or prevalence (57%). While diagnosis and treatment were among the most frequently present, they were also the most frequently incomplete or inaccurate: only 50% of discussions of diagnosis were complete and accurate, and 47% for treatment. Conclusions: Many websites are available for patients with thyroid cancer, however quality is variable. Most sites lack information patients can use to assess a website’s trustworthiness, such as authorship, citations and currency. Nearly all sites require a reading level far above the average of most patients (i.e. grade six). There are significant gaps in accurate information regarding diagnosis and treatment. This information can help guide care providers and thyroid-centric societies in developing patient education resources.

C13 Vivian Ma, Pediatric Surgery

Dress for success? Silver impregnated nanocrystalline dressing for initial treatment of giant omphalocele
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Introduction: An omphalocele is a congenital abdominal wall anomaly affecting 1 in 4,000 to 6,000 live births. Other anomalies are associated with omphalocyes in 13-25% of patients. This along with the size of the omphalocele, classified as small, giant or ruptured, affect mortality. Given such associations, treatment includes initial operative closure versus delayed non-operative management to facilitate escharization and gradual compression and visceral reduction. Although there is no consensus regarding the optimal management of giant omphalocyes, there is evidence showing that conservative management may be associated with lower mortality, decreased hospitalization and time to early feeding. Traditionally, conservative management consists of daily silver sulfadiazine dressing changes. Objectives: This study aims to compare patient outcomes, cost and resource utilization between patients treated with twice-weekly silver impregnated (SI) nanocrystalline dressings and daily silver sulfadiazine (SS) dressings for the initial non-operative management of giant ophthalocyes. Methods: A retrospective chart review of patients with giant omphalocyes treated with silver impregnated dressings was performed then compared against those treated with silver sulfadiazine dressings. Various mean +/- SD parameters were measured including gestational age, birth weight, giant omphalocele size, days on ventilator, days in NICU, time to full feeds and discharge, time to closure and cost. Results: Between 2014 and 2016, five patients were treated with SI dressings and five with SS dressings. No ruptures occurred. One mortality from pulmonary infection occurred in the SI group. For the SI and SS cohorts, there was no significant difference in maternal age (29 ± 9y, 30 ± 5y, p=0.79), gestational age (36 ± 4wks, 38 ± 2wks, p=0.41) birth weight (2.6 ± 0.63kg, 2.7 ± 0.50kg, p=0.84) or GO size (10.2 ± 4.7cm, 68.4 ± 1.9cm, p=0.33), mean ventilator days (7.5 ± 8.7d, 6.0 ± 8.2d, p=0.80), days in NICU (41 ± 20d, 37 ± 20d, p=0.79), days to discharge (62 ± 41d, 53 ± 29, p=0.73) or days to full feeds (30 ± 15d, 17 ± 11d, p=0.21). The average in-hospital cost of SI dressings was $1100 CAD/week, versus $109 CAD/week for SS dressings. Conclusion: For initial non-operative management of GO, twice weekly silver impregnated nanocrystalline dressings are a safe and effective alternative to silver sulfadiazine dressings. Use of these dressings results in decreased handling of infants as well as decreased physician and nursing resource utilization at a comparable cost with no significant difference in patient outcomes.

C14 Hannah Foggin, Plastic Surgery

Evaluation of the viability and function of adipose-derived stem cells within a bioengineered liquid skin substitute
Hannah Foggin, Nicholas Carr, Peter Lennox, Asia Ghahary, and Reza Jalili 1 Burn and Wound Healing Research Group, Division of Plastic Surgery, Department of Surgery, International Collaboration on Repair Discoveries (ICORD), University of British Columbia

Background: Chronic wounds have potential to cause significant morbidity and mortality, posing social and financial burden from recurring infection and decreased ability to work. As complications of other diseases, such as pressure ulcers in paralyzed individuals with spinal cord injury, they are difficult to care for and, with current paucity of effective treatments, often remain unhealed. Adipose-derived stem cells (ASCs), relatively abundant and easy to extract, have been extensively studied as a novel source of cells and of unique cytokines and growth factors. Preliminary findings have shown that ASCs cultured under regular 2D conditions shift primarily toward a myofibroblast-like phenotype, which in large quantity may result in hypertrophic scarring. Additionally, and importantly, a collagen gel as liquid skin substitute can fully fill and cast to the shape of wound beds. Objective: To compare viability, proliferation rate, and differentiation of human ASCs cultured within a collagen-hydrogel matrix and those in a regular two-dimensional culture plate condition. Methods: ASCs were isolated from subcutaneous human fat tissues using collagenase digestion and then cultured in either a collagen gel or a regular 2D culture plate. Frequency of ASCs was identified by assessing surface markers (CD44+, 73+, 90+, 146+, 31-, 34-, 45-) with flow cytometry. Seven days post-culture, frequency was again evaluated, and viability and proliferation rate were evaluated using Live/Dead staining and MTT assay, respectively. Results: Embedding ASCs within a collagen ECM did not have any deleterious effect on ASC viability and metabolic function assessed via Live/Dead staining and MTT assay respectively. More importantly, ECM-embedded ASCs proved to maintain stemness phenotype (determined by CD146+/44+/31- surface markers) several folds greater than ASCs cultured in regular 2D condition. Conclusion: ASCs can effectively be cultured in 3D gel: compared to 2D culture environments, their differentiation can be better regulated to maintain stemness while also maintaining viability and proliferation rate. A bioengineered collagen gel liquid skin substitute in conjunction with implanted ASCs thus holds potential as a promising treatment for improved wound care and healing.

C15 Daniel Demsey, Plastic Surgery

Predictive Factors and Outcomes in Major Burn Patients with Renal Injury
Demsey D, Mordhorst A, Griesdale D, Papp A

Background: Renal failure in major burn patients is associated with high mortality, reported at between 60-80% in recent literature. Recent Quality Improvement work at our center suggests recent mortality in this cohort is lower than reported. Our paper investigates the associated factors and mortality rate in major burn patients with AKI. Methods: A retrospective review was conducted consisting of 151 burn patients admitted to the Vancouver General Hospital (VGH) Intensive Care Unit between 2010 and 2016. Patients were excluded if there was prior history of kidney disease. Data was collected from patient charts, electronic medical records, and the VGH ICU research database. Baseline and demographic information, as well as laboratory and clinical information regarding course and management in hospital was collected. This data was analyzed to develop a multiple fractional polynomial regression model to identify significant factors associated with development and outcomes of AKI at VGH. Results: Of the 151 patients included, 64 people develop AKI (42%) as defined by the Acute Kidney Injury Network (AKIN) criteria. Of these, 27 patients required renal replacement therapy (RRT). Mortality of patients requiring RRT is 39%, and 15% for patients with AKI and no RRT. Unadjusted regression analysis identifies age, Acute Physiology and Chronic Health Evaluation (APACHE II) score, cumulative fluid balance within first 24 hours, total body surface area % (TBSA%), and use of vasoactive agents as associated with significantly increased
C16  Luke Zawadiuk, Plastic Surgery
Title: Recurrent Breast CSF Pseudocyst and Updated Literature Review
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Background: Ventriculoperitoneal shunts (VP) are standard treatment for hydrocephalus. In the United States, approximately 30,000 VP shunts are placed each year. Shunt revision is common (30-50% within the 1st year) with shunt fracture being the causative event in 5-15% of revision cases. As the number of breast implant surgeries being performed increases, breast pseudocyst caused by VP shunt rupture should be understood as a possible complication of surgery. We present such a case in the setting of breast asymmetry surgery in a young patient. Objectives: To present a case of breast cerebrospinal fluid (CSF) pseudocyst secondary to VP shunt rupture in a patient who underwent breast implant surgery and to provide an updated literature review investigating breast-related VP shunt complications. Methods: We searched Ovid MEDLINE, Ovid EMBASE, Google Scholar and PubMed to identify reports of breast related VP shunt complications using keywords including: “cerebrospinal fluid,” “CSF,” “breast,” “pseudocyst,” “ventriculoperitoneal shunt.” We compared and classified the identified cases using categories described in a study by Schrot and colleagues (2012). Results: Our literature review identified 27 cases of VP shunt malfunction involving the breast. CSF pseudocyst is the most common presentation of breast related VP shunt malfunction with the majority being caused by shunt migration. Here, we present an atypical case of CSF pseudocyst formation secondary to VP shunt fracture. Our literature review revealed only two other reported cases of shunt fracture leading to CSF pseudocyst in patients receiving breast implants with preexisting VP shunts. The time from shunt placement to rupture in these patients who underwent breast surgery was 20 years in one case and at least 8 years in the other. Similarly, our patient’s shunt had fractured 22 years since placement, and two years since receiving breast implants. This is echoed in the literature as shunts older than five years showed evidence of deterioration as they became calcified, rigid, and fragile. Conclusions: We present a rare case of breast CSF pseudocyst. The combination of an old VP shunt with breast implant surgery was the likely cause of shunt failure and subsequent CSF pseudocyst formation. The age of the VP shunt should be taken into consideration when discussing shunt revision, as manipulation of calcified tissues surrounding the shunt may put it at greater risk of damage. With the increasing rates of breast surgery, it is possible that there will be an increase in VP shunt complications in patients undergoing breast surgery. In cases of breast swelling with pre-existing VP shunts and subsequent breast implant placement, CSF pseudocyst should be considered even without common clinical signs of VP shunt failure.

C17  Syed Shuja Raza, Otolaryngology
Title: Selective Secretion of miR-605-5p via Extracellular Vesicles Plays a Complex Role in Oral Squamous Cell Carcinoma
Syed Shuja Raza, Rebecca Tawel, James Lawson, Cathie Ginnis, Division of Otolaryngology, Department of Surgery, University of British Columbia, Vancouver, BC, Canada
Introduction: Extracellular vesicles (EVs) are small, membrane bound vesicles released from cells that contain various types of cargo, including microRNAs – short, non-coding RNAs that can post-translationally regulate gene expression. MicroRNAs have been implicated in a variety of cancers including Oral Squamous Cell Carcinoma (OSCC). Recently, we have identified miR-605-5p as being selectively enriched in the EVs of OSCC cells despite being undetectable in the cells from which the EVs were derived – indicating this miRNA is efficiently and selectively packaged and released from the tumor cells.
Objective: Our objective was to determine the role of miR-605-5p in OSCC. Methods: The status of miR-605-5p was assessed in publicly available miRNA expression data sets and its impact in oral cell lines was determined by overexpressing the miRNA and assessing changes in cellular proliferation. miR-605-5p levels were assessed in the EVs and the impact of these EVs on cell lines of stromal origin was determined. Results: miR-605-5p was downregulated in publicly available oral cancer microRNA expression data sets (p =0.0033), indicating this may be a potential tumor suppressive microRNA. Conversely, overexpression of miR-605-5p in the oral dysplasia cell line DOK and the tumor line SCC25 results in an increase in proliferation. EVs derived from these cells had an impact on stromal cell lines. Conclusions: Taken together, these results suggest miR-605-5p may play a complex role in OSCC. Further investigation is required to gain a full understanding of the specific role this miRNA plays in oral tumor cells and its effect on its surrounding microenvironment.

C18  Rachel Chen, Otolaryngology
Title: MicroRNA Expression Profile in Sensorineural Hearing Loss
Rachel Chen, Desmond A Nunez, Division of Otolaryngology, Department of Surgery, University of British Columbia, Vancouver, BC, Canada
Background: Sensorineural hearing loss (SNHL) is a consequence of inner ear sensory organ or cochlear nerve transmission pathway damage that affects more than 60% of Canadians over the age of 70 years. Presbycusis and idiopathic sudden onset sensorineural hearing loss are two clinical presentations of SNHL, the pathogenetic mechanisms of which are not well understood. MicroRNAs (miRNAs) small, non-coding RNAs are known to play a role in the regulation and expression of the inner ear organs may have a role in the pathogenesis of SNHL. Hypothesis: The development of sensorineural hearing loss is associated with changes in the expression profile of circulating miRNAs. Methods: A narrative review of articles on the role of miRNAs in the pathogenesis of SNHL. Articles were identified by searching the Medline, PubMed, Web of Science, and Embase databases for articles published between 2000 and March 2017. Results: 8 studies were identified. 6 found evidence that miRNAs in pro-apoptotic pathways are up-regulated while miRNAs in proliferative and differentiation pathways are down-regulated in presbycusis. 2 found circulating levels of miRNAs precursor enzyme components to be altered in ISSNHL. Conclusion: Circulating miRNAs are altered in ISSNHL. There is as yet no direct evidence of a similar change in SNHL.

C19  Diana Forbes, Plastic Surgery
Title: Novel Therapy for Complex Wounds using a Dermal Gel Matrix with Adipose Derived Stem Cells
Diana Forbes, MD1,2; Mohammadreza Pakyari, MD2; Ruhangiz Kilani, PhD2; Aziz Ghahary, PhD2; Reza Jalili, MD, PhD2. 1 UBC Plastic and Reconstructive Surgery, 2 BC Provincial Firefighters Burn and Wound Healing Lab.
Background: Wound repair and regeneration is a multidisciplinary field of research with considerable value to the treatment of burn injuries and difficult chronic wounds such as pressure and diabetic ulcers. The ideal therapy would involve restoring the essential components of a matrix scaffold and the necessary cells for healing. Over the last decade, mesenchymal stem cells (MSCs) have become the focus of research in regenerative medicine owing to their ability to provide the essential building blocks for skin regeneration. In our current study, we utilize a validated method of wound splitting in diabetic mice to investigate the pro-healing effects of a novel, in-situ forming dermal gel matrix in combination with adipose-derived stem cells (ASCs) in improving the healing of complex wounds. Methods: To ensure ASC survival within the gel matrix, cells were incubated with the gel matrix for 14 days prior to in-vivo studies. Viability was tested at days 3, 7, and 14. With UBC ethics testing, full thickness excisional wounds were created and split on the dorsum of genetically diabetic mice. Eighteen animals were randomized into 3 groups: 1) occlusive dressing only (control), 2) gel only, 3) gel + ASCs. Wounds were photographed at days 0, 7, 10, 14 and wound area was calculated using Image J Software. Histologic samples of the wounds were obtained and examined for architecture and collagen content using Hematoxylin and Eosin (H&E) and Masson Trichrome staining respectively. Results: Viability testing showed that the gel matrix supported the survival of ASCs. In vivo testing showed that the application of the dermal gel matrix significantly accelerated epithelialization (p<0.001). Wounds treated with gel + ASCs had a trend towards faster rate of healing after Day 10. Histology showed earlier re-epithelialization in both treatment groups. Conclusion: The application of the novel dermal gel matrix in combination with adipose-derived stem cells (ASCs) improves healing of complex wounds in a diabetic mouse model.
Investigation of the molecular mechanisms underlying human inner ear disorders is impeded by limited access to inner ear tissue. The domestic pig is considered as an important model for studies of human health, particularly for complex diseases.

Objectives: To characterize in vitro porcine inner ear cells grown in culture, determine a suitable housekeeping gene for reverse transcriptase polymerized chain reaction (RT-qPCR) studies with these cells, and, determine the inter-passage stability of the cells characteristics.

Materials and Methods: Cochlear and vestibular tissues were harvested from adult pigs, cultured, and characterized at different passage levels (P2 to P8). Gene and protein expression of inner ear hair cell (HC) and supporting cell (SC) markers (Myosin Vili, Prestin, Nestin, Cytokeratin 18 and Vimentin) were determined using RT-qPCR and immunofluorescence respectively. In RT-qPCR, three housekeeping genes, glyceraldehyde-3-phosphate dehydrogenase (Gapdh), beta-actin (b-Act), and hypoxanthine phosphoribosyltransferase 1 (Hprt1) were examined for suitability as an endogenous control based on stable expression level across several passages. The relative target gene expression in cell cultures P2-P8 was measured with reference to: cochlear and vestibular P0 cells respectively by comparative Cycle threshold (Ct). The difference in levels (presented as fold changes) was statistically analyzed by Students T-test.

Results: The porcine inner ear cells showed positive immunofluorescence to Myosin Vili, Prestin, Nestin, Cytokeratin 18 and Vimentin cytochemical markers at all passages tested P2-P8 though intensity and dispersion varied. Hprt1 showed more consistency from P2 to P8 with a mean Ct value range 21.4-23.8, compared to Gapdh 13.55-17.1 and b-Act 12.03-23.5. Relative gene expressions were significantly elevated for Prestin (p values <0.05) at P2 (fold change - 5.36), P4 (1.88), and P5 (6.94) in cochlear cells, and at P2 (3.94), P4 (4.39), P6 (6.37) and P8 (1.32) in vestibular cells. Similarly, Vimentin was elevated at P3 (4.97), P4 (8.53), P5 (11.99), P6 (12.01) and P8 (3.35) in vestibular cells; Prestin at P2 (13.92) and P5 (10.15) in cochlear cells; and Cytokeratin 18 at P7 (5.75) in cochlear cells. Myosin Vili expression was significantly reduced (p<0.05) at P5 (0.49), P6 (0.19) and P7 (0.17) in cochlear cells, and at P2 (0.20) and P8 (0.21) in vestibular cells; Cytokeratin 18 at P2 (0.03), P3 (0.007), P4 (0.005), P5 (0.001), P6 (0.002), P7 (<0.001) and P8 (<0.001) in vestibular cells.

Conclusions: Hprt1 is the preferred housekeeping gene for RT-qPCR in porcine inner ear cell studies. Genes and proteins that are usually present in pro-sensory, neural stem and mesenchymal cells are repeatedly identified through several in vitro culture passages of porcine inner ear cells confirming the persistence of both HC and SC characteristics, though individual gene expression levels varied over time.
demonstrate the four steps in the retrograde medial dissection of the RLN in thyroid surgery. 342 thyroid surgeries were performed in 17 months, including 213 hemithyroidectomies, 91 total thyroidectomies, and 38 completion thyroidectomies. With regard to complications, the rate of transient and permanent hypocalcemia was 13% and 3% respectively, the rate of vocal cord paresis was 9%, and the rate of vocal cord paralysis was 0.3%. The median surgical times for total thyroidectomy, hemithyroidectomy, and completion thyroidectomy were 48 minutes (Interquartile range [IQR]: 40 – 60 min), 39 minutes (IQR: 33 – 47 min) and 40 minutes (IQR: 35 – 51 min) respectively. 1% of cases required conversion to an alternative surgical approach.

Conclusion: In a head and neck endocrine practice that utilizes the retrograde medial approach to RLN dissection, the rate of complications is comparable to those reported with other approaches, the surgical efficiency appears to be enhanced, and the conversion rate to other approaches is low.

C24 Oleksandr Butskiy, Otolaryngology
Title: Gastric pull up as a primary reconstructive option for circumferential pharyngoesophageal junction defects: morbidity, mortality, and functional outcomes in a cohort of 48 patients
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Background: Gastric pull up (GPU) for reconstruction of pharyngoesophageal junction defects has historically been associated with high morbidity and mortality. Given availability of other reconstructive options, the outcomes of offering GPU as a primary reconstructive option have not been evaluated in a modern surgical setting. Furthermore, functional outcomes of GPU reconstruction have not been previously evaluated using validated patient reported outcomes. Objectives: To review all GPU cases by a single head and neck surgeon between 1988 and 2017 and to determine: (1) rates of morbidity and mortality; (2) overall and disease specific survival; (3) factors possibly affecting survival; and (4) speech, swallowing and quality of life outcomes.
Methods: Morbidity, mortality, and functional outcome data was retrospectively collected for a cohort of 48 consecutive patients who received GPU reconstruction by a single surgeon from 1988 to 2017. Starting in 2012, all surviving and new patients were invited to complete Voice Handicap Index and EORTC – QLQ – H&N35 questionnaires, and undergo a modified barium swallow assessment. Results: The obtained data showed: (1) 6% and 19% incidence mortality and gastro-pharyngeal anastomotic complications respectively; (2) Median overall and disease specific mortality of 1 year (95% CI: 8 – 29 months) and 1 year 11 months (95% CI: 1 year – NA) respectively; (3) History of radiation and chemoradiation failure (HR 3.12; 95% CI: 1.24 – 7.84), American Society of Anesthesiologists (ASA) class IIIIV (HR 3.63; 95% CI: 1.47 – 8.99), and presence of in-hospital complications (HR 3.89; 95% CI: 1.46 – 10.31) as factors negatively affecting overall and disease specific survival; (4) GPU voice prosthesis users reporting moderate to severe speech handicap, and long term GPU survivors reporting relatively free swallowing and moderately high levels of overall health and quality of life. Conclusion: GPU continues to be a challenging operation that should be reserved for patients with ASA status II and lack of respiratory co-morbidities. Long term, GPU patients should expect to use a voice prosthesis with moderate to severe speech handicap, while maintaining a relatively normal swallowing function and moderately-high quality of life.

C25 Oleksandr Butskiy, Otolaryngology
Title: Nasal septum squamous cell carcinoma: the first classification system and a case series
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Background: Nasal septum squamous cell carcinomas are rare. While there is no consensus on the optimal treatment of these tumors, surgery is commonly the mainstay of treatment in most centers. Surgical treatment of affected facial structures presents a formidable challenge and a plethora of resection and reconstructive approaches have been described in the literature. These approaches have not been systematized. Objectives: To describe the first classification system for septal squamous cell carcinomas guiding the ablative and reconstructive approaches to the midface. To present a case series illustrating each stage of the classification system. Methods: All cases of nasal septal squamous cell carcinomas performed at the Vancouver General Hospital in the division of Otolaryngology – Head and Neck Surgery between January 2015 and June 2017 were retrospectively reviewed. The surgical steps were prospectively photo-documented by the principle investigator. Results: The classification system organizes the nasal septal squamous cell carcinomas into three stages. Stage I is defined as carcinomas with resection margins isolated to bony or cartilaginous septum, preserving the nasal tip supports. Stage II is defined as carcinomas with resection margins violating the nasal tip support but preserving the nasal skin envelope. Stage III is defined as carcinomas with resection margins violating the nasal tip support and the skin envelope. Stage III further sub classifies extension of the resection margins to the maxillary crest (Stage IIIaM), frontal sinus (Stage IIIaF), and the orbit (Stage IIIo). A case series of 6 patients is presented to illustrate the recommended ablative and reconstructive approaches for each stage in the classification system. Conclusion: The first nasal septal squamous cell carcinoma classification system is proposed and is illustrated through a case series. The classification system is simple and practical, guiding ablative and reconstructive surgical approaches.

C26 Amin Javer, Otolaryngology
Title: Effect of Endoscopic Sinus Surgery on Clinical Outcomes in Cystic Fibrosis
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Introduction: Chronic rhinosinusitis (CRS) is prevalent in the Cystic Fibrosis (CF) population. CRS exacerbations in CF are thought to contribute to pulmonary exacerbations. Literature regarding the impact of endoscopic sinus surgery (ESS) is inconclusive. This study aims to examine the rates of lung function decline and pulmonary exacerbation rates in CF patients who have undergone ESS. Objective: To examine the rates of lung function decline and pulmonary exacerbation rates in CF patients who have undergone ESS. Methods: Retrospective review of 40 adult CF patients at a tertiary care centre between 2005 and 2015. Demographic data, rate of lung function decline (Forced Expiratory Volume1(FEV1) % predicted, year 1 and 2 post-operatively), and number of pulmonary exacerbations (treatment with IV/oral antibiotic therapy +/- hospital admission) were recorded. Results: Forty patients with CF (mean age 37.4, 60% male) were reviewed. Twenty underwent ESS. No significant difference was found between the surgical group and matched non-surgical controls in baseline FEV1(72.5% vs. 72.7%, p=0.98), 2-year pre-operative number of pulmonary exacerbations (3.05 vs. 1.65, p=0.10), or Lund-Mackay scores (12.25 vs. 11.55, p=0.71). No significant difference was found in 1-year post-operative FEV1(70.5% vs. 72.8%, p=0.84), 2-year post-operative FEV1 (70.4% vs. 72.6% p=0.80), and 2-post-operative number of pulmonary exacerbations (1.7 vs. 1.45, p=0.87). In the surgical group, no significant difference was identified between preoperative and postoperative FEV1, 1-year (2.51%, p=0.32) and 2-years after ESS (-3.10%, p=0.51), or in postoperative rate of pulmonary exacerbations (-1.28, p=0.11).
Conclusion: In this study, ESS does not appear to significantly improve FEV1 or significantly decrease the number of pulmonary exacerbations post-operatively.

C27 Amin Javer, Otolaryngology
Title: Comparison of Ambulatory Surgical Centers to Hospital Based Facilities in Outcomes of Endoscopic Sinus Surgery
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Introduction: Endoscopic sinus surgery (ESS) is used for treating patients with chronic rhinosinusitis (CRS). Major complications occur in 1-3% of procedures. While studies show that surgeries performed at ambulatory surgical centres (ASC) are not inferior to those performed at hospital-based facilities (HBF) in mortality and unexpected hospitalization, no study demonstrates data on the safety of ESS performed at an ASC, compared to a HBF. This study compares the complication and revision rates of ESS performed in HBF and ASC. Objective: To compare the complication and revision rates of ESS performed in HBF and ASC.
ASC. Methods: A retrospective review of patients who had ESS for CRS with one rhinologist (January 2013-May 2015) in both HBF and ASC settings was conducted. Only patients classified as American Society of Anaesthesiologists I and II were included. Major complications occurring during the surgery, rates of revisions, and procedure duration were recorded. T-tests and logistic regression methods were used to compare the outcomes of both groups.

Results: Charts of 458 patients (Mean age: 49.4 years) were reviewed. Of these, 218 had their surgeries in a HBF and 240 in an ASC. The complication rate was 1.1% (1.4% in HBF, 0.8% in ASC). The surgical revision rate was 4.8% (4.6% in HBF, 5.0% in ASC). The mean duration of the procedure was 118.7 and 125.7 minutes in HBF and ASC respectively. There was no statistically significant difference in any of the three outcomes of interest (p-values = 0.58, 0.99, 0.06 respectively). Conclusion: There is no significant difference in complication rates, revision rates, or procedure duration between ESS conducted in HBF compared to ASC.

C28 Michelle Ng, Pediatric Surgery
Title: Hand Hygiene Education Campaign at Soroti Regional Referral Hospital, Uganda
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Background: Health care-associated infections are a common cause of adverse events in healthcare settings worldwide, and contribute to additional patient morbidity and mortality. One statistic we the World Health Organization showed the prevalence of such infections to be between 5.7-19.1% in low and middle-income countries. In developing countries, 10 out of every 100 hospitalized patients develop at least 1 healthcare-associated infection. Some factors previously identified for limited resource settings are: inadequate environment hygiene conditions, and lack of knowledge or application of basic infection control. The WHO recommends the implementation of global best practice in hand hygiene as one of the solutions to this issue. Previous research done at Soroti Regional Referral Hospital (SRRH) identified that health care providers recognize the importance of hand hygiene, and despite this the compliance is still low. This project was an implementation of a WHO hand hygiene campaign at SRRH during May 2017.

Methods: Our objective in the long term is to improve overall hand hygiene compliance and knowledge at SRRH; and in the short term to provide hand hygiene education and assess compliance in health care professionals. This campaign consisted of 3 parts: 1) Pre-intervention - observation of hand hygiene according to WHO observation surveys in 9 areas of SRRH; calculation of compliance (%) for physicians and nurses. 2) Workshops - education to physicians and head nurses on hand hygiene steps and the “Five Moments of Hand Hygiene” were conducted over 5 sessions. 3) Post-intervention - observation of hand hygiene following similar methods as pre-intervention; discussion among stakeholders on barriers to hand hygiene.

Results: Compliance rate pre-intervention was 15.7% (nurses 9.1%, physicians 28.6%).

C29 Kyle Arsenault, Vascular Surgery
Title: Venous arterialization for non-reconstructible lower extremity arterial disease - A multi-centre case series
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Background: Approximately 15% of patients with critical limb ischemia are not candidates for revascularization due to lack of target outflow vessels. The prognosis for these patients is grim, with major amputation being the only option for pain control or wound healing. A potential alternative for these patients is venous arterialization of the foot, which may provide reverse flow to the capillary beds and increase collaterals. Methods: Between January 2016 and February 2017, we performed fourteen venous arterialization procedures on thirteen patients for critical limb ischemia at three Canadian vascular surgery centres. We present a case series of our initial experience with this procedure, including indications, techniques, and patient outcomes.

Results: Patients undergoing a venous arterialization procedure were between 51 and 87 years old (median 73.5). Patients had significant comorbidities with diabetes mellitus in nine (69%), dialysis-dependence in three (23%), and contralateral amputations in three (23%). All patients had critical limb ischemia, with Rutherford classification of 4 in two limbs, 5 in ten limbs and 6 in two limbs. All patients had undergone previous attempts at revascularization, including either surgical bypass, tibio-pedal angioplasty, or catheter-directed thrombolysis for a thrombosed popliteal aneurysm. Patients underwent pre- or intraoperative ultrasound mapping of the distal greater saphenous vein (GSV) and the superficial venous system in the foot. A bypass was performed using the remaining ipsilateral GSV or harvested arm vein from the most distal suitable artery to the GSV, which was left in-situ. Through a venotomy at the ankle, valves proximally and distally were lysed. All patients had intraoperative completion angiograms. Three patients underwent concomitant digital amputations. Technical success was 93%. One patient died perioperatively. Primary patency at 30 days was 85%. Ten patients had relief of their rest pain. Three further patients died within 90 days. Four patients underwent major amputation. Conclusions: Venous arterialization may provide symptom relief and tissue healing in patients with otherwise non-reconstructible lower extremity arterial disease. Our early experience is encouraging, but further followup and development of post-procedural strategies are required to assist with the long term limb-salvage benefits of this procedure.

C30 Aria Shokouhi, Radiation Oncology
Title: Management of Differentiated Thyroid Cancer In Accordance With the American Thyroid Association Guidelines: Impact on Patient Disease Free and Overall Survival Outcomes
Aria Shokouhi, Cheryl Ho, Jonn Wu, Sabrina Gill, Adam White, George Sexsmith, Eitan Pritman, Sam M. Wiseman, Eric Berthelet

This objective of this study was to evaluate practice adherence to the upfront management of DTC in accordance with the ATA guidelines and the impact on outcomes. The British Columbia Cancer Agency (BCCA) provides cancer care for over 4.5 million Canadians. A retrospective review of DTC patients referred to the BCCA between 2009 and 2013 was conducted. Baseline characteristics, upfront surgical management, and adjuvant radioactive iodine (RAI) and external beam radiation therapy (EBRT) utilization, were evaluated. Management of disease was assessed for adherence with the 2009 ATA guidelines. Disease free survival (DFS) and overall survival (OS) were estimated using the Kaplan Meier method and compared with the log rank test. 1099 DTC patients were referred to the BCCA (~70% of all diagnoses of DTC in the province). Baseline characteristics: female sex 73%, median age 50, histology; papillary 90%, follicular 7%, Hurthle cell 3%. Stage at presentation using the AJCC 7th edition was: pt1 45%, pt2 18%, pt3 31%, pt4 5%, unknown T 1%, pN0 26%, pN1 36%, N 38%, and CM1 3%. Surgical management for multifocal disease and/or cancer > 1 cm was; lobectomy, total thyroidectomy, and staged total thyroidectomy in 3%, 69%, and 28%. Lymph node sampling was performed for tumors > 4 cm in 62%. RAI was delivered in 83% of patients with tumors > 4 cm, M1 disease and/or gross extra-thyroidal extension. XRT was utilized in 48% with T4 lesions. The 5 year outcomes for management consistent with guideline recommended primary surgical care and/or nodal management versus nonadherence was DFS 84% versus 91% (p=0.23), and OS 94% versus 90% (p=0.10). The 5 year outcomes for guideline recommended adjuvant RAI +/- XRT versus nonadherence was DFS 85% versus 65% (p=0.02), and OS 95% versus 83% (p=0.057). In our population-based cohort, compliance with ATA guideline recommended surgical management did not affect the DFS or OS. The DFS was significantly inferior if patients did not receive the recommended adjuvant RAI +/- XRT. RAI and XRT are integral components of the management of DTC and should be utilized within the context of ATA guideline treatment recommendations.

C31 Ramin Hamidizadeh, Vascular Surgery
Title: Influence of arterial and venous diameters on autogenous arteriovenous access patency
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Background: The autogenous arteriovenous fistula (AVF) is the standard procedure for patients requiring chronic hemodialysis. To enhance its success, preoperative Duplex ultrasound has been used to determine fistula location based on venous and arterial diameters. Previous authors have suggested that a
minimum outflow vein diameter (MOVD) and perianastomotic arterial diameter are associated with successful maturation. **Objectives:** The goal of this study was to determine anatomical and clinical variables that may influence access patency to guide optimal autogenous access configuration selection.

**Methods:** AVF created from 2010-2016 were analyzed from data entered into a prospective database. Pre-procedure duplex mapping data of venous and arterial diameters, and demographic and clinical variables were collected. Kaplan Meier and Cox Hazards analysis were used to assess patencies, maturation, and identify independent predictors of access failure. **Results:** Five hundred thirty-five AVF were created (median follow-up 17.0 months; range 0 - 73). Of these, 265 (49.5%) were radiocephalic, 221 (41.3%) were brachiocephalic, and 49 (9.2%) were brachiobasilic. AVF with a MOVD <3mm were associated with inferior primary patencies at 12 (43±4% vs. 54±4%; P = 0.009) and 36 months (19±4% vs 33±4%), and secondary patencies at 12 (75±3% vs. 91±2%, p<0.001) and 36 months (63±4% vs. 78±4%; P<0.001). Arterial diameter <2mm for radiocephalic AVF was associated with impaired maturation at 12 months in diabetics vs. non-diabetics (53±9% vs. 87±8%), with no differences observed in maturation rates with radical artery diameters > 2mm (84±5% vs. 85±4%) (P = 0.019). On multivariate regression, MOVD (HR 0.02; 95% CI 0.01-0.23, P = 0.002) female sex (HR 1.75 95%CI 1.12-2.73) and diabetes (HR 1.67; 95% CI 1.00 – 2.79; P = 0.048) were associated with secondary patency loss. **Conclusions:** MOVD is strongly predictive of autogenous access patency. Radial artery diameter <2mm was predictive of radiocephalic AVF failure to mature, but only in diabetic patients.

**C32** Harman Parhar, Otolaryngology

**Title:** Patient Refusal of Cancer-Directed Contributions to Survival in Head and Neck Squamous Cell Carcinoma Outcomes

Harman S. Parhar, MD1,2, Donald W. Anderson, MD1, Arif S. Janjua, MD1, J. Scott Durham, MD1, Eitan Prisman, MD1. 1. Division of Otolaryngology - Head & Neck Surgery, University of British Columbia 2. T.H. Chan School of Public Health, Harvard University

**Objectives:** Recent studies have demonstrated significant outcomes disparities among different demographic groups with head and neck squamous cell carcinoma (HNSCC). We aimed to investigate the potential contribution of cancer directed surgery (CDS) refusal to these disparities by estimating the rate of CDS refusal, identifying the predictors for CDS refusal, and estimating the impact of CDS refusal on cancer-specific survival. **Methods:** Retrospective linked nationwide analysis of the Surveillance, Epidemiology, and End Results Database (2004-2014). New cases of HNSCC who were surgical candidates were included. A multivariable logistic regression model was created to identify demographic and clinical factors associated with refusal and Kaplan Meier/Cox regression was used to analyze survival. **Results:** Of 114,506 patients with HNSCC, 58,816 (51.4%) were CDS candidates and of those, 1550 (2.7%) refused surgery. Those who refused CDS were more likely to be older (67.1 +/- 12.6 vs 63.6 +/- 13.1, p<0.01), of Black (OR 1.49, 95% CI:1.28-1.74) or Asian (1.79, 95% CI:1.46-2.20) ethnicity, unmarried (OR married 0.50, 95% CI 0.44 -0.58), have an advanced tumor and have a hypopharyngeal (OR 2.87, 95% CI:2.31-3.58) or laryngeal (OR 1.90, 95% CI:1.68-2.16) primary. **Conclusion:** Refusal of CDS impaired a 2.16-fold (95% CI 2.02-2.30) increased risk of cancer-specific death. 2.7% of patients refuse CDS which impairs survival. Refusal is associated older age, Black or Asian ethnicity, being unmarried, having an advanced stage tumor and having a primary site in the hypopharynx or larynx. Knowledge of these disparities may help providers emphasize the advantages of surgery and may also help patients make informed decisions.

**C33** Harman Parhar, Otolaryngology

**Title:** 60-Day Readmission following Transoral Robotic Surgery for Oropharyngeal Squamous Cell Carcinoma: A Nationwide Analysis

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**Background:** With a dramatic increase in the incidence of HPV-related oropharyngeal carcinoma (OPSCC), there has been a significant interest in the use of minimally invasive techniques, such as transoral robotic surgery (TORS), to avoid the morbidity conferred by traditional surgical approaches and radiotherapy. We aimed to estimate the 60-day readmission rate and identify predictors of readmission. **Methods:** Retrospective linked nationwide analysis (2012-2014) using the federal all-payer Nationwide Readmission Database. Patients who underwent TORS for OPSCC were stratified by readmission status and analyzed for patient-level covariates (age, sex, comorbidity, insurance, income, disposition), concurrent procedures (tracheostomy, gastrostomy, graft, neck dissection) and postoperative complications (hemorrhage, prolonged ventilation, aspiration/pneumonia, wound complications). **Results:** 955 patients underwent TORS: 950 (99.5%) survived index admission and 174 (18.3%) were readmitted for complications. Hemorrhage accounted for 23.6% of readmissions and diet/aspiration complications for 18.4%. Of those readmitted, 16.1% required operative control of bleeding, 10.3% required transfusion, 4.0% required tracheostomy, and 18.4% required gastrostomy. Those readmitted had higher rates of index hemorrhage (8.6% vs 4.1%, p<0.01), aspiration/pneumonia (8.1% vs 4.4%, p=0.02) and wound complications (10.3% vs 5.5%, p=0.02). After multivariate analysis, factors associated with readmission were high number of comorbidities (OR 4.035, 95% CI 1.566-10.397, p<0.01) and discharge to Home Care (OR 1.701, 95% CI 1.058-2.735, p<0.01) or Skilled Nursing Facility (OR 3.345, 95% CI 1.370-7.219, p<0.01). **Conclusions:** 18.3% of patients undergoing TORS for OPSCC were readmitted within 60-days and 32.8% of readmissions occurred between 30 and 60-days. Postoperative hemorrhage (23.6%) and diet related complications (18.4%) were significant contributors.

**C34** Queenie Hui, General Surgery

**Title:** The Role of Islet Resident Macrophages and β-cells in Amyloid-Induced IL-1β Production in Human Islets: Implications for Clinical Islet Transplantation

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**Introduction:** Islet amyloid is a pathologic characteristic of type 2 diabetes (T2D) that also forms in human islets during pre-transplant culture and following transplantation. These β-cell toxic protein aggregates are mainly comprised of a normally produced β-cell peptide named human islet amyloid polypeptide (hIAPP). hIAPP amyloid contributes to β-cell dysfunction and death in T2D and islet grafts but the underlying mechanisms remain unclear. We previously showed that biosynthetic hIAPP aggregates promote interleukin (IL)-1β production in human islets, thereby inducing β-cell upregulation of the Fas cell death receptor and apoptosis. **Objectives:** In this study, we investigated the cellular source(s) of amyloid-induced IL-1β production in human islets.

**Methods:** Isolated human islets (n=6-8 donors) transduced with Ad-prohIAPP-siRNA (to suppress amyloid formation) or non-transduced were treated with or without a neutralizing IL-1β antibody or clodronate (to deplete macrophages) and cultured in elevated (11.1 mmol/l) glucose to potentiate amyloid formation for up to 7 days at 37°C. Amyloid formation, islet IL-1β levels, β/ᶷcell ratio and β-cell apoptosis were assessed. **Results:** Freshly isolated islets had no detectable amyloid and very low levels of IL-1β. Islet culture resulted in progressive amyloid formation (detected by electron microscopy and thioflavin S staining), elevated islet IL-1β production, β-cell Fas upregulation, caspase-8 and -3 activation and apoptosis, all of which were prevented by inhibition of amyloid formation. Interestingly, islet resident macrophages were detectable after 7-day culture at 37°C. Macrophage depletion significantly reduced, but did not completely prevent, amyloid-induced IL-1β immunoreactivity in β-cells. Moreover, neutralizing IL-1β markedly reduced (but did not completely prevent) IL-1β immunoreactivity in human islet β-cells. **Conclusions:** Taken together, these data suggest that resident macrophages (mainly) and β-cells (to a lesser extent) are two cellular sources of amyloid-induced IL-1β production in human islets. Preventing IL-1β production or blocking IL-1β action can protect human islets in conditions associated with islet amyloid formation such as type 2 diabetes and clinical islet transplantation.

**C35** Karen Slater, Plastic Surgery

**Title:** The Risk of Waiting: Breast Cancer Development in BRCA+ Patients Awaiting Risk-Reducing Mastectomy and Immediate Breast Reconstruction

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Background: Inherited BRCA1 or BRCA2 (BRCA1/2) mutations confers a 56%-84% lifetime risk for developing primary breast cancer. Bilateral risk reducing mastectomy (RRM) reduces breast cancer risk for BRCA1/2 carriers by approximately 90%. **Objectives:** To examine wait times for BRCA mutation carriers undergoing RRM and immediate breast reconstruction. We hypothesize that there is a clinically significant rate of breast cancer occurrence in British Columbian patients during wait-time for RRM with immediate reconstruction. **Methods:** A retrospective review of BRCA1/2 mutation carriers identified by the British Columbia Cancer Agency (BCCA) between 2000 and 2012 was performed. Patients were identified through the BCCA Hereditary Cancer Program. Patients with a breast cancer diagnosis at the time of genetic testing were excluded. Charts were reviewed for demographic information, breast cancer risk factors, specialist consultation dates, surgical dates, reconstructive details, and surgical pathology. **Results:** A total of 1137 patients were identified as BRCA1/2 mutation carriers by BCCA from 2000 to 2012. 533 patients with a pre-existing cancer diagnosis at time of BRCA mutation identification were excluded. 64 of the remaining 584 patients were diagnosed with cancer after their BRCA mutation was identified. Patients who developed breast cancer were compared to those who successfully underwent RRM and reconstruction. Data was analysed to confirm the rate of cancer development whilst waiting for risk-reducing surgery. **Conclusion:** BRCA positive patients experience long delays while waiting for risk reducing mastectomy and immediate breast reconstruction. This is the first study to examine breast cancer development in women waiting for RRM with immediate reconstruction. This study emphasizes the need for increased prioritization of prophylactic breast surgery.

C36 Javier Ospina, Otolaryngology

**Title:** Using the EQ-SD to calculate the cost-effectiveness of Endoscopic Sinus Surgery for the treatment of Chronic Rhinosinusitis in Canada

**Methods:** A retrospective review of BRCA1/2 mutation carriers identified by the British Columbia Cancer Agency (BCCA) between 2000 and 2012 was performed. Patients were identified through the BCCA Hereditary Cancer Program. Patients with a breast cancer diagnosis at the time of genetic testing were excluded. Charts were reviewed for demographic information, breast cancer risk factors, specialist consultation dates, surgical dates, reconstructive details, and surgical pathology. **Results:** A total of 1137 patients were identified as BRCA1/2 mutation carriers by BCCA from 2000 to 2012. 533 patients with a pre-existing cancer diagnosis at time of BRCA mutation identification were excluded. 64 of the remaining 584 patients were diagnosed with cancer after their BRCA mutation was identified. Patients who developed breast cancer were compared to those who successfully underwent RRM and reconstruction. Data was analysed to confirm the rate of cancer development whilst waiting for risk-reducing surgery. **Conclusion:** BRCA positive patients experience long delays while waiting for risk reducing mastectomy and immediate breast reconstruction. This is the first study to examine breast cancer development in women waiting for RRM with immediate reconstruction. This study emphasizes the need for increased prioritization of prophylactic breast surgery.

C38 Amin Javer, Otolaryngology

**Title:** Bone Mineral Density in Recalcitrant Chronic Rhinosinusitis Patients on Long-Term Intranasal Budesonide via Mucosal Atomization Device: A Cross-Sectional Study

**Methods:** A retrospective review of BRCA1/2 mutation carriers identified by the British Columbia Cancer Agency (BCCA) between 2000 and 2012 was performed. Patients with a pre-existing cancer diagnosis at time of BRCA mutation identification were excluded. 64 of the remaining 584 patients were diagnosed with cancer after their BRCA mutation was identified. Patients who developed breast cancer were compared to those who successfully underwent RRM and reconstruction. Data was analysed to confirm the rate of cancer development whilst waiting for risk-reducing surgery. **Conclusion:** BRCA positive patients experience long delays while waiting for risk reducing mastectomy and immediate breast reconstruction. This is the first study to examine breast cancer development in women waiting for RRM with immediate reconstruction. This study emphasizes the need for increased prioritization of prophylactic breast surgery.

C39 Hui-Hsuan Clare Chiu, Pediatric Surgery

**Title:** Teacher-Learner Contract (TLC): an objectives-based checklist for surgical shadowing

**Methods:** Participants were recruited by email. The participants were asked to use the TLC during a single shadowing experience; 28 students and 18 surgeons responded to a post-shadowing questionnaire assessing the TLC’s ease of use and general feedback. Thematic analyses of the responses were done using NVivo software. **Results:** In general, students and surgeons reported that the TLC focused learning and improved communication between teachers

C40 Dr. Geoffrey Blair (UBC Department of Surgery); Co-Investigators: Dr. Garth Warron (UBC Department of Surgery), Bababunmi Fashola (Office of Pediatric Surgical Evaluation and Innovation), Damion Duffy (Office of Pediatric Surgical Evaluation and Innovation), Karen D’Souza, Dan Cojocaru, Tran Shu (Angela) J. and Hui-Hsuan (Clare) Chiu

**Background:** Shadowing is an important way for first- and second-year medical students to explore different specialties, connect with mentors, and develop clinical skills. However, its informal nature means that experiences vary greatly and so do the learning outcomes. **Objective:** The Teacher-Learner Contract (TLC) is an objectives-based checklist that was developed as a framework for surgical shadowing.

**Method:** 39 student-surgeon pairs were recruited by email. The participants were asked to use the TLC during a single shadowing experience; 28 students and 18 surgeons responded to a post-shadowing questionnaire assessing the TLC’s ease of use and general feedback. Thematic analyses of the responses were done using NVivo software. **Results:** In general, students and surgeons reported that the TLC focused learning and improved communication between teachers
and learners. Students also commented that using the TLC prompted them to reflect on their goals and consider how the shadowing experience might contribute to their overall medical education. Quantitatively, both students and surgeons found benefit in using the checklist (mean 3.5 SD 0.745 and mean 3.778 SD 1.06 respectively, where 1 was not useful and 5 was very useful). Both students and surgeons rated the TLC as easy to use, and 80% of respondents said they would use the tool again. Conclusion: The TLC is a useful tool to facilitate meaningful shadowing experiences for teachers and learners and may even have longitudinal impacts.

C40  Andrew Thamboo, Otolaryngology
Title: The Functional and Psychological Burden of Empty Nose Syndrome
1St. Paul’s Sinus Centre, Vancouver, British Columbia, Canada; 2Faculty of Medicine, University of Melbourne, Australia; 3Division of Rhinology, Department of Otolaryngology – Head and Neck Surgery, Stanford University School of Medicine, Palo Alto, CA
Background: Empty nose syndrome (ENS) is a debilitating disorder thought to arise as a post-surgical phenomenon from excessive loss of nasal tissues. Affected patients often report a profound impact on all aspects of life, but the extent of this burden has not been quantified. Objective: We sought to determine the impact of ENS on mental health and functional status. Methods: A cross-sectional study was performed of ENS individuals recruited from online ENS forums. ENS status was validated based on positive empty nose syndrome questionnaire score (ENS6Q) and sinus CT imaging or supporting medical documentation. Subjects completed the ENS6Q, patient health questionnaire (PHQ-9) for depression, generalized anxiety disorder questionnaire (GAD-7), Epworth sleepiness scale for daytime somnolence (ESS), work productivity and impairment (WPAI) questionnaire, and the EuroQol general health state survey (EQ-5D-5L). Pearson correlation analysis was performed using an α=0.05 to determine significance. Results: Fifty-three ENS individuals were included (N=53). Overall, participants reported symptoms consistent with moderate anxiety (µ=12.7, SD 5.9) and moderately severe depression warranting treatment (µ=17.9, SD 6.8). Participants also noted a 62% reduction in productivity (p<0.001) and 65% in all other activities (n=53). ENS6Q symptom severity was correlated with more severe depression (p<0.001), anxiety (p=0.001), overall pain/discomfort (p=0.002), and impairment in activities of daily living (p=0.003). Conclusions: ENS individuals carry a clinically significant psychological burden and experience difficulties with many activities of daily living. A multimodal approach in addressing the tissue loss with surgery and cognitive behavioral therapy for the psychological burden may provide the most optimal outcome.

C41  Andrew Thamboo, Otolaryngology
Title: The Geographical Distribution of Empty Nose Syndrome
1St. Paul’s Sinus Centre, Vancouver, British Columbia, Canada; 2Faculty of Medicine, University of Melbourne, Australia; 3Division of Rhinology, Department of Otolaryngology – Head and Neck Surgery, Stanford University School of Medicine, Palo Alto, CA
Background: Empty Nose Syndrome (ENS) is a post-surgical phenomenon from excessive loss of nasal tissues, particularly the inferior turbinate. Given the inferior turbinate is instrumental in maintaining nasal homeostasis in different environments, it is believed that ENS symptoms only arise in certain geographical areas of the world. Objective: We sought to determine the geographical distribution of ENS patients and the impact of local factors on symptom severity. Methods: A cross-sectional study was performed of individuals recruited from online ENS forums. ENS status was validated based on positive empty nose syndrome questionnaire score (ENS6Q) and sinus CT imaging or supporting medical documentation. Participants completed a survey encompassing demographic, geographic and clinical questions. Temperature, humidity, and pollution data were collected from global climate databases. Pearson correlation analysis was performed using an α=0.05 to determine significance. Results: Fifty-three ENS individuals were included (N=53). Participants were distributed across fifteen countries over six continents. While temperature (SD 6.4), humidity (SD 2.5) and pollution (SD 3.9) varied between cities, there was no significant association found between ENS severity and these factors. However, many ENS6Q symptomatic reported an exacerbation of ENS symptoms in response to dry air (94%), air conditioning (64%), change in season/weather (60%), and transitioning between indoors/outdoors (40%). Conclusions: ENS is less likely a geographic condition than a condition that does not tolerate acute shifts in climate. These findings stray from the traditional dogma that ENS is only experienced in dry geographical areas and highlights the importance of recognizing this condition independent of geographic location.

C42  Amin Javer, Otolaryngology
Title: Intranasal Retinoic Acid Treatment for Patients with Olfactory Loss: A Randomized Controlled Trial
William Mak, Sara Derikvand, Christopher Oplaksie, Habb Al-Rahim, Amin Javer, Division of Otolaryngology, University of British Columbia, St. Paul's Sinus Centre, Vancouver, British Columbia, Canada
Introduction: Chronic rhinosinusitis (CRS) is defined as inflammation of the sinonasal cavities lasting longer than 12 weeks. CRS is a common etiology of olfactory dysfunction, specifically hyposmia and anosmia. Objectives: This randomized control trial aims to evaluate the efficacy of topical retinoic acid (RA) on restoring olfaction in CRS patients and explore synergistic effects with olfactory training (OT). Methods: 52 patients at St. Paul's Sinus Centre were diagnosed with CRS and olfactory dysfunction. Patients were randomized to one of three arms - RA with OT (Arm A), RA only (Arm B), and control (Arm C). All patients concurrently received CRS standard of care treatments. Patients with neurodegenerative disorders or physical obstruction of the olfactory cleft were excluded. The 'sniffin' Sticks® olfactory test generated a TDI score, consisting of odor threshold, discrimination, and identification. The test was performed at the initial visit and after 6 months of treatment. Scores were used to diagnose and evaluate treatment responses. Results: 16 patients were assigned to Arm A, 19 to Arm B, and 17 to Arm C. The mean population age was 57.5 years (SD: 13.4). Based on a 2-tailed paired/independent t-test comparing scores at 0 months and 6 months, Arms A and B had statistically significant TDI score improvements with t-values of 4.51 (p<0.00041) and 4.07 (p<0.00071) respectively. The control group Arm C had an insignificant t-value of 1.31 (p>0.05). Conclusions: The statistically significant improvement of mean TDI scores in olfactory dysfunctional patients receiving RA with OT and RA only over a 6 months period demonstrates potential for these interventions. Further research with a larger sample size is needed to evaluate the clinical significance of patient outcomes is currently ongoing at our clinic.

C43  Amin Javer, Otolaryngology
Title: Povidone-Iodine: A New Treatment Option for Recalcitrant Chronic Rhinosinusitis
Warren Mullings, Rikesh Panchpatra, Katrien Samoy, Habb Al-Rahim, Sara Derikvand, Amin Javer Division of Otolaryngology, University of British Columbia, St. Paul’s Sinus Centre, Vancouver, British Columbia
Introduction: Chronic rhinosinusitis (CRS) is a common inflammatory condition of the nasal passage and paranasal sinuses. The antibiotic options for CRS treatment are limited and often either unsuccessful or unable to stop the reoccurrence of CRS. Objectives: To investigate the effect of adding Povidone-Iodine to sinus rinses on endoscopic Modified Lund-Kennedy (MLK) scores for the treatment of recalcitrant CRS. Methods: This is a retrospective chart review of 59 recalcitrant CRS patients with or without nasal polyposis (CRSw/sNP), allergic fungal rhinosinusitis (AFRS) or cystic fibrosis (CF), who added Povidone-Iodine rinses to their treatment regimen between August 2015 and July 2017. Fifty-three post-operative patients who were recalcitrant to appropriate medical management inclusive of steroids, surfactants, topical and/or oral antibacterial or antifungals within the previous 3 months were included in the study. There was objective evidence of bacterial or fungal infection culture or endoscopy prior to the commencement of the Povidone-Iodine rinses. Patients had follow-up appointments at least 6 weeks apart. Results: At the first follow-up appointment, MLK scores decreased significantly compared to the baseline measurement (n = 53; mean decrease = 1.15; 95% CI of the decrease, 1.79-0.51; P < 0.001). A similar decrease was found at the second follow-up visit compared to baseline values (n = 32; mean decrease = 1.06; 95% CI of the decrease, 1.98-0.14; P < 0.026), and at the third (n = 24; mean decrease = 1.29; 95% CI of the decrease, 2.42-0.16; P = 0.027). No significant decrease was found at the fourth appointment. Purulent discharge or allergic mucin was also significantly reduced at the first follow-up appointment (n = 53; mean decrease of the ‘discharge’ subset scores = 0.38; 95% CI of the decrease, 0.68-0.07; P = 0.017). Conclusions: The addition of Povidone-Iodine rinses to recalcitrant CRS management was associated with an overall improvement in MLK scores over 18 weeks, and a reduction in purulent discharge or allergic mucin especially after the first 6 weeks. Further research to delineate the efficacy and safety of Povidone-Iodine rinses in the management of biofilm reduction and symptom improvement in refractory CRS patients is currently ongoing at our clinic.
In islet cells under long-term high glucose culture, Bcl-x knockout amplified disruption to normal Ca²⁺ signaling and mitochondrial responses to glucose, suggesting that they behave more similarly to β-cells. Network morphology and kinetics are associated with a decrease in total mitochondrial volume and a marked impairment of β-cell function. Islet mitochondrial homeostasis may thus provide new insight into the etiology of T2D. Hypothesis: Bcl-xL overexpression causes β-cell adaptation to glucotoxic stress.

**Results:**

- The most common cause of delay is the lack of available OR. To improve target achievement of emergency surgeries, BC Children’s Hospital should find ways to more-efficiently allocate emergency cases to available rooms.

**Conclusion:**

- The most common cause of delay is the lack of available OR. To improve target achievement of emergency surgeries, BC Children’s Hospital should find ways to more-efficiently allocate emergency cases to available rooms.

**C45**

Nicole Mak, Thoracic Surgery

**Title:** Thymic liposarcoma: Report of a Rare Giant Anterior Mediastinal Mass in a Fifty Year Old Female

Nicole Mak 1, John K. O’Connor 2, Sharon Ong 1. UBC Department of Surgery, Division of General Surgery, UBC Clinician Investigator Program 2. UBC Department of Pathology, Fraser Health Authority, Department of Pathology 3. UBC Department of Surgery, Division of Thoracic Surgery, Surrey Memorial Hospital, Department of Surgery, Division of Thoracic Surgery

**Background:** Thymic liposarcoma is a rare neoplasm and may arise from the lung, pleura or mediastinal tissues. Less than 20 cases of thymic liposarcoma have been reported in the literature. Management of thymic liposarcoma varies due to its rarity. Treatment almost always involves attempt at complete surgical resection. The effectiveness of neoadjuvant and adjuvant therapies for the prevention of disease recurrence is unknown. It is postulated that intrathoracic liposarcomas behave similarly to liposarcomas arising in other locations. However, given the very low frequency of their presentation and the lack of reports of long-term follow-up in the literature, this is yet to be confirmed and treatment remains individualized.

**Clinical case:** A 47 year old woman presented with a 4 year history of progressive dyspnea. Initially diagnosed as asthma, a chest X-ray demonstrated almost complete white-out of the left chest. Further characterization by CT scan showed a giant fat-containing mass large enough to occupy the majority of the left hemithorax. Originating from the anterior mediastinum, it caused atelectasis of the majority of the left lung, mediastinal shift towards the right, and displaced the spleen inferomedially. Resection of the 28 cm, 2.9 kg mass was performed by open left thoracotomy. Removal of the tumour required careful dissection around its pseudocapsule as well as fracturing of the patient’s ribs and sacrificing of her left phrenic nerve. Upon pathology, the mass was characterized as a grade 1, well-differentiated liposarcoma arising from the thymus with 20% necrosis and no evidence of dedifferentiation.

**Conclusion:** Thymic liposarcoma is a very rare disease entity and its best treatment is not yet known. The case presented here suggests that patients who undergo careful oncologic resection of well-differentiated, low grade thymoliposarcomas may have long-term disease-free survival without receiving adjuvant radiotherapy.

**C46**

Michelle (Mahshid) Ebtia, Plastic Surgery

**Title:** Evaluation of the Anti-Lipotoxic Effects of the FS2 on Human Pancreatic Islets

Mahshid Ebtia 1, Sanaz Mahmoudi 1, Reza B. Jafari 1, Aziz Ghahary 1. 1. Department of Surgery, University of British Columbia, Vancouver, BC, Canada 2. BIOPEP Solutions Inc. Richmond, BC, Canada

**Introduction:** Prolonged exposure of human pancreatic islets to palmitate, induces a pro-inflammatory response that leads to islet inflammation in type 2 diabetes, compromising insulin secretion. FS2, a proprieary amino acid derivative, has been shown to have modulatory effects on insulin release in rat and human pancreatic islets in vitro. Our research is designed to evaluate anti-lipotoxic effects of this molecule on human pancreatic islets in vitro.

**Hypothesis:** Treatment of human pancreatic islets with FS2 prevents detrimental effects of lipotoxicity. **Methods:** Human islets were cultured in regular medium or high palmitate conditions (500 µM) for 72 hours in the presence or absence of FS2 (50 µg/ml). The viability, cell survival ratio, and lipotoxic ER stress were then tested using Live/Dead staining, MTT assay, and qPCR respectively. **Results:** Incubating human islets in high palmitate conditions significantly decreased their viability and function compared to those cultured in normal medium. Live/Dead staining and MTT assay findings suggest an improvement of viability of human islets treated with FS2 under lipotoxic conditions, compared to no FS2 treatment. qPCR analysis of hCHOP (as an ER stress marker) and hXBp1L1 (as an ER stress marker against actin and hPRT as housekeeping and internal control markers respectively, revealed ~2 fold increase in the viability of human islets treated with FS2 under lipotoxic conditions, compared to no FS2 treatment. **Conclusion:** Our results suggest that FS2 partially prevents the effects of lipotoxicity on islets. Cell viability is partially preserved through FS2 treatment under lipotoxic culture conditions. With further research, FS2 might serve as a novel approach to prevention and treatment of diabetes mellitus progression.

**C47**

Rocky Shi, General Surgery

**Title:** Anti-apoptotic Bcl-xL affects Mitochondrial Networking and Function in Pancreatic β-cells

Rocky Shi, Ahsan Chaudhry, Alexis Shih and Dan S. Luciani, Department of Surgery/General Surgery, UBC BC Children’s Hospital Research Institute

**Background:** High levels of glucose and fatty acids (glucolipotoxicity) promote failure and death of insulin-secreting pancreatic β-cells, and this is a significant factor in the development of type 2 diabetes (T2D). Glucose-stimulated insulin secretion depends on mitochondrial oxidative metabolism and mitochondrial dysfunction contributes to T2D. Mitochondria exist as dynamic networks and the control of mitochondrial biomass, motility and fusion/fission kinetics is essential for cellular health and function. In β-cells, it has been reported that mitochondrial networking affects their ability to withstand glucolipotoxicity. We recently demonstrated that the anti-apoptotic protein Bcl-xL dampens β-cell mitochondrial metabolism and studies in other cell types suggest Bcl-xL regulates mitochondrial biomass and dynamics. Glucolipotoxic stress and T2D are both associated with reduced Bcl-xL.

**Objective:** To determine the role of Bcl-xL, we used in vitro over-expression and studied β-cell-specific Bcl-xL knockout mice. Glucose-stimulated Ca²⁺ responses, mitochondrial oxygen consumption were measured to evaluate β-cell function. Islet cells were cultured in 25mM glucose for 6 days to induce mild glucotoxic stress. Mitochondria were visualized by 2D/3D confocal imaging and for the quantitative analysis of mitochondrial structures, we developed an image analysis pipeline in FIJI/ImageJ.

**Results:** Bcl-xL overexpression causes β-cell mitochondria to lose their normal tubular network structure, aggregate and become motionless. These changes to network morphology and kinetics are associated with a decrease in total mitochondrial volume and a marked impairment of β-cell O₂ consumption and Ca²⁺ responses to glucose. Bcl-x knockout islets cells at basal glucose levels were found to have increased mitochondrial polarization and decreased average mitochondrial size and increased Ca²⁺ responses to glucose stimulation, suggesting that they behave more similarly to β-cells undergoing glucose stimulation. In islet cells under long-term high glucose culture, Bcl-x knockout amplified disruption to normal Ca²⁺ signaling and mitochondrial responses to glucose.
stabilization. **Conclusions:** Our in vitro data demonstrate a significant role for Bcl-xL in the control of mitochondrial networking and function in pancreatic β-cells.

### C48 Matthew Chan, Radiation Oncology

**Title:** Validation of patient reported outcome measures in patients receiving high dose radiation therapy for gynecologic malignancies

**Background:** Patient reported outcomes before and during external beam radiotherapy for gynecologic cancers were collected using a 41 point questionnaire as part of standard of care at our institution. Questionnaires were offered to patients before and during radiotherapy at up to weekly intervals. Objectives: having confirmed the ability to collect this data in a previous study, we sought to validate the utility of this questionnaire in order to determine how and when to collect this data to greatest clinical advantage. **Methods:** Between 1 March 2015 and 30 November 2016, 237 patients filled out a baseline pre-treatment and at least one additional questionnaire during or after 6 weeks after a course of high-dose pelvic radiotherapy for a gynecologic malignancy. Questions rated specific bowel, bladder, and vaginal well-being parameters on a 5-point scale. Change from pre-treatment score was recorded for each patient as a function of the number of weeks into the radiotherapy course. **Results:** Nearly all 41 questions rating bowel, bladder and vaginal well-being detected patterns consistent with onset and resolution of acute gastrointestinal (GI) and genitourinary (GU) side effects. A single summary question inquiring on overall GI well-being showed 72% of patients experienced decline in GI well-being by week 5, which was more sensitive than any of the other 13 more specific GI questions. The single GU summary question showed 45% of patients reporting decline in well-being by week five, which was more sensitive than any of the other 11 specific GU questions. Vaginal and sexual functioning questions were almost half as likely to be answered than the summary GI or GU questions but responders were more likely to report problems. Using the GI and GU summary questions, well-being was measurably worse if patients were treated with 3D CRT versus VMAT (88 versus 76% reported GI toxicity by week 5, while 53 versus 35% reported GU toxicity by week 5, respectively). The addition of an integrated lower pelvic boost to pelvic radiation fields using a VMAT technique was also found by these summary questions to worsen GU well-being (35 versus 57% with boost reported GI toxicity by week 5) but not overall GI well-being (76 versus 71% with boost reported GI toxicity by week 5). **Conclusion:** This questionnaire is sensitive enough to detect a decrement in GI, GU and vaginal well-being and can resolve differences in acute radiotherapy toxicity based on varying techniques and dose. Most of the trend to worsening GI and GU well-being occurring during radiotherapy can be assessed with simplified summary questions. An increasing proportion of patients reported morbidity in each succeeding week suggesting that questionnaires need to be offered weekly in order to capture the onset of symptoms.

### C49 Dianne Valenzuela, Otolaryngology

**Title:** Primary versus secondary tracheoesophageal puncture for voice rehabilitation in laryngectomy patients: a systematic review

**Methods:** A systematic review of studies in the English literature was conducted for studies that directly compared primary and secondary TEP. A comprehensive search of MEDLINE, EMBASE, and Web of Science was performed.

**Results:** 1392 unique titles were identified and 82 full texts articles were reviewed. 11 retrospective clinical cohort studies were ultimately included. No randomized controlled trials were identified. Newcastle-Ottawa score for assessment of quality ranged from 5 to 7. Success rate was defined differently across most studies. Two studies found higher success with primary TEP compared to secondary TEP; nine studies found no difference. Voice outcomes were inconsistently measured; no difference between groups was found in 4 studies. The mostly commonly reported complications were leakage around the TEP, pharyngocutaneous fistula, and stomal stenosis. Overall, complications between primary and secondary TEP were similar. **Conclusions:** Overall, the literature is of low quality. No difference between primary and secondary TEP was found in all but one study which showed a higher rate of pharyngocutaneous fistula rate.

### C50 Kimberley Luu, Otolaryngology

**Title:** Assessing the educational value and impact on safety of a pre-operative CT Sinus Anatomy Review Tool

**Introduction:** Performing endoscopic sinus surgery requires an intricate understanding of the anatomy of the paranasal sinuses. Avoidance of adverse events requires careful review of pre-operative computed tomography (CT) images, which may be aided by a preoperative checklist. The objective of the study is to determine the educational value of a pre-operative CT Sinus review tool and to evaluate the impact of using this tool on the pre-op image review practice.

**Methods:** 12 Otolaryngologists from varying practice levels reviewed 2 preoperative CT scans: 1 with the tool and 1 without the tool, in random order. A 6-item Likert scale questionnaire assessed the operator experience. The number of high-risk anatomical features identified, a determination of overall safety risk and case difficulty, and time needed for pre-op review were compared between the scans reviewed without and with the tool. **Results:** All participants found the tool useful in capturing important anatomy and facilitated confident assessment of case risk and difficulty. The number of high-risk features identified by each participant had a variance of 1.03 without the tool, compared to 0.4 with the tool. The overall case risk and difficulty were rated lower when using the checklist. Using the checklist required significantly more time to complete the pre-op image review (p=0.0005). **Conclusion:** A preoperative CT sinus tool is perceived by surgeons at all levels to be a useful tool prior to sinus surgery. The tool requires more pre-op planning time, but increases the number and consistency of high-risk features that are identified.
**C51 Jennifer Culig, Vascular Surgery**

**Title:** Management of Small High Altitude Carotid Body Tumors; Is Surgery the Best Option?

*Dr. Alberto Munoz, Dr. Jennifer Culig, Universidad Nacional de Colombia, University of British Columbia*

**Background:** This study has been conducted as an international study affiliated with Universidad Nacional de Colombia. The number of Carotid Body Tumors (CBT) in Canada are rare, however; in high altitude cities like Bogota, Colombia the prevalence of this vascular pathology is high. Although experience with carotid body tumors in high altitude cities 2000 meters above sea level is frequently reported, there continues to be controversy over management of small CBTs. Surgical resection for any size of CBT has been typical management in the past however this can be associated with many risks and complications. We analyzed patients diagnosed with small CBT (<2cm) in the vascular laboratory in Bogota Colombia to identify rate of growth, symptoms, and malignancy. We determined whether these tumors were managed with conservative management rather than conventional surgery and resection.

**Methods:** Cross sectional cohort of patients who underwent carotid duplex and were diagnosed with small CBT (< of equal to 2cm in size) at the Bogota Vascular Clinic Vascular Laboratory from Jan 2008 – Dec 2013 were included in this study. Demographics, CBT growth, symptoms, imaging and management were gather by phone survey or clinic visit.

**Results:** 4076 carotid duplexes were performed and 139 patients (3.41%) were found to have CBT. Thirty nine of those patients were found to have small CBT. Mean age of diagnosis was 62 years old with a male to female ration of 8:1. Average followup was 4.2 years with a yearly growth rate of 0.141 cm. The average size of symptomatic carotid was 1.31 cm while average size of asymptomatic patients was 1.49 cm. 11.1% of these were resected.

**Conclusions:** High altitude CBT have slower growth rate rand lower incidence of malignancy when compared to studies of familial CBT. Because the rate of growth is slow and patients tend to be asymptomatic it is reasonable to safely follow these small CBT with duplex scanning rather than immediate surgical resection. Genetic testing could be added to better identify patients who may benefit from early surgery. More research is required in this field to truly determine best management for small carotid body tumors.

**C52 Austin Taylor, General Surgery**

**Title:** The physiological actions of islet amyloid polypeptide

*Austin Taylor1-3, Jaques Courtade1-3, C. Bruce Verchere1 4 BC Children’s Hospital, 2University of British Columbia Faculty of Medicine, 3Department of Pathology & Laboratory Medicine, 4Department of Surgery*

**Background:** Islet amyloid polypeptide (IAPP) is produced and secreted alongside insulin from beta cells in pancreatic islets. IAPP is first produced as a prohormone (proIAPP) which is processed to a mature, 37-amino acid, C-terminally amidated peptide. In states of diabetes and beta cell dysfunction, IAPP production and secretion become dysregulated. While the major physiological actions of IAPP remain to be elucidated, IAPP has been found to slow gastric emptying, reduce post-prandial glucagon secretion, and act in the central nervous system (CNS) to induce satiety through reduction in meal size. IAPP has also been shown to reduce insulin-induced glucose uptake and glycogen synthesis in liver and muscle, and act on beta cells to induce pro-proliferative signalling. Specific IAPP receptors have been identified as the calcitonin receptor (a GPCR) heterodimerized with one of the 3 receptor activity modifying proteins to generate 3 IAPP receptors (AMY1 – AMY3) with high affinity for IAPP. AMY1-3 have been identified in the CNS (hypothalamus and area postrema) and adipose tissue, suggesting a role for IAPP in nutrient intake and storage. Significant reductions in body weight are achieved in obese patients injected twice daily with the FDA-approved IAPP analogue, pramlintide, while rats continually infused with pramlintide have lower body weight than placebo controls though a reduction in food intake and an increased energy expenditure. With IAPP’s reported actions in energy homeostasis and islet signalling, we hypothesized that IAPP is involved in islet stress adaptation and peripheral nutrient metabolism.

**Methods:** IAPP knockout mice were backcrossed for 10 generations to C57BL/6J mice to generate global IAPP-null mice on the Bl6 background strain. Male and female IAPP−/− mice with trio-mate IAPP+/+ controls (cage mates from trio harem breeding) were fed high fat diet (HFD; 45% kcal from fat) or matched control chow diet (chow; 10% kcal from fat) starting at 6-7 weeks of age and monitored biweekly up to 36 weeks of age for changes in energy homeostasis and glucose metabolism.

**Results:** IAPP deletion had no effect on glucose tolerance or fasted blood glucose concentration in male or female mice fed HFD or chow diet. IAPP−/− mice on chow diet display increased body weight relative to wild-type trio-mate control mice, while IAPP−/− mice fed HFD display no difference in body weight to wild-type control mice on HFD.

**Conclusions:** IAPP is involved in the regulation of body weight, while the mechanism through which IAPP exerts its effects remains to be found.
2017 Department of Surgery Faculty Achievement Awards

Hjalmar Johnson New Investigator Award – Dr. Eitan Prisman

Eitan Prisman is an Otolaryngology Head and Neck surgeon and Clinical Assistant Professor at the Vancouver General Hospital and the University of British Columbia specializing in Head and Neck Surgical Oncology. He has an undergraduate and graduate degree in Computer Science and Applied Mathematics. After completing medical school and residency at the University of Toronto, Dr. Prisman completed his fellowship training in Head and Neck Oncology, Trans Oral Robotic Surgery (TORS) and microvascular reconstructive surgery at the Mount Sinai Medical Center in Manhattan.

Dr. Prisman specializes in the management of head and neck cancer, and microvascular reconstruction of the Head and Neck. His clinical expertise included oral, larynx, thyroid, salivary gland and cutaneous malignancies. Dr. Prisman’s research interests include virtual surgical planning, functional outcomes and developing oncological screening techniques. He is co-investigator on 4 clinical trials and has numerous clinical publications. He enjoys academic teaching and is the Continuous Medical Education Director for Otolaryngology at the University of British Columbia.

Richard J Finley Senior Investigator Award – Dr. Amin Javer

Dr. Amin Javer was born in Kenya and immigrated to Vancouver at the age of 14. He completed his undergraduate education at Simon Fraser University, earning a Bachelor of Science Degree in Molecular Biology achieving 1st class honors. Dr. Javer proceeded to UBC where he earned his medical degree, graduating in 1991. After a one-year internship at the University of Saskatchewan at the Regina General Hospital, Dr. Javer returned to Vancouver and UBC to continue his studies. Dr. Javer completed an additional four-year otolaryngology (one year research) and one year core general surgery training, earning his specialist credentials. In 1998, Dr. Javer proceeded to complete a two-year fellowship at the Georgia Nasal and Sinus Institute in Savannah, Georgia, specializing in Advanced Rhinology and Sinus/Skull Base Surgery under the directorship of Dr. Frederick A Kuhn.

Dr. Javer has varied research interests with over 100 research publications and over 10 book chapters. He has a special interest in advanced FESS (functional endoscopic sinus surgery), frontal sinus surgery and fungal sinus disease. Dr. Javer has been awarded several awards and honors in research and in surgical teaching during his career at UBC. He started the sinus fellowship-training program at the St. Paul’s Sinus Centre in 2001, which has graduated 15 subspecialized surgeons from seven different countries. He presents regularly at international sinus courses, and is fluent in eight languages. He is currently a full clinical professor in the department of surgery at the University of British Columbia, the fellowship-training director at UBC, co-director of research in the division of Otolaryngology at UBC, and director and head of the St. Paul’s Sinus Centre.
A History of the 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. The visiting professor presented original research as part of the day as well as judged the clinical and basic science presentations. The Department is grateful for this wonderful legacy that Madeline and Wally Chung have left for the Department.

1995 Lloyd MacLean, Department Head, Surgery, McGill University and President of the American College of Surgeons
1996 John Duff, University of Western Ontario: “Multisystem organ failure: manifestations and mediators”
1997 K. Wayne Johnston, University of Toronto “Issues in the management of abdominal aortic aneurysms in a rapidly changing health care environment”
1998 Charles H. Tator, Professor and Chair, Division of Neurosurgery, The Toronto Hospital: “The breadth of surgical research in the 1990’s”
1999 Garth Warnock, Chief General Surgery, University of Alberta Hospitals, Director, Division of Surgical Research, University of Alberta “Progress in transplantation of insulin-secreting tissues for diabetes mellitus”
2000 Paul Walker, Vice President, Toronto General Hospital
Professor of Surgery and Laboratory Medicine, Pathobiology, University of Toronto “The continuing challenge of sepsis”
2001 James C. Thompson, Ashbel Smith Professor of Surgery, University of Texas Medical Branch “Endocrine tumors of the pancreas”
2002 Richard J. Finley, Professor, Department of Surgery Head, Division of Thoracic Surgery, University of British Columbia “Future of image guided minimally invasive thoracic surgery”
2003 Douglas W. Wilmore, Frank Sawyer Professor of Surgery, Department of Surgery Brigham and Women’s Hospital, Boston, Massachusetts “The pathophysiology and treatment of intestinal failure”
2004 John Wong, Chair of Surgery & Head, Department of Surgery University of Hong Kong Medical Centre, Queen Mary Hospital, Hong Kong “Complications of esophagectomy: confess and remember”
2005 Richard K. Reznick, R.S. McLaughlin, Professor and Chair, University of Toronto Department of Surgery, Banting Institute, Toronto, Ontario “Surgical training in 35 hours per week: laudable or lunacy?”
2006 James T. Rutka, Janes Visiting Professor in Surgery, Dan Family Chair in Neurosurgery, Professor and Chairman, Division of Neurosurgery, University of Toronto “Astrocytoma invasiveness: molecular mechanisms form the leading edge”
2007 Markus W. Büchler, Professor of Surgery, Division of General Surgery Chairman Surgical Unit, University of Heidelberg “Evidence based pancreatic surgery”
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 “From Blood and Guts to Bits, Bytes and Beyond – Upgrading the Surgical Apprentice Model”
2009 Andrea L. Pusic, Assistant Attending Surgeon, Plastic and Reconstructive Surgery, Memorial Sloan-Kettering Cancer Center, New York “Measuring patient reported outcomes in surgery”
2010 Yvan Douville, Chief, Department of Surgery, University of Laval “Evolution of Stentgraft for Treatment of Abdominal Aortic Aneurysms”
2011 Gerald Fried, Chair, Department of Surgery, McGill University “Teaching Billy how to operate: can we do better?”
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. “Precious Times”
2013 Lorelei Lingard, Professor and Director of the Centre for Education Research & Innovation, Schulich School of Medicine & Dentistry, Western University, London, ON “Beyond communication skills: A rhetorical approach to communication for advancing the practice and teaching of teamwork”
2014 Thomas Waddell, Chair, Division of Thoracic Surgery, University of Toronto, Professor, Department of Surgery, University of Toronto Head, Division of Thoracic Surgery, UHN, Senior Scientist, Toronto General Research Institute, UHN “The role of research training in surgical education”.
2015 Garnett Sutherland, Professor, Clinical Neurosciences, University of Calgary, Founder and Director, Seaman Family MR Research Centre, Alberta Heath Services. “Magnetic resonance imaging and robotic surgery.”
2016 Dr. Ivar Mendez, Fred H. Wigmore Professor and Unified Head of the Department of Surgery at the University of Saskatchewan – “Robotic and distance tele-mentoring surgery.”