

# UNIVERSITY OF BRITISH COLUMBIA



## DEPARTMENT OF SURGERY

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# UNIVERSITY OF BRITISH COLUMBIA

## DEPARTMENT OF SURGERY

**30<sup>th</sup> Annual Residents' Research Day - April 26<sup>th</sup>, 2007**  
**Paetzold Health Education Auditorium**



General Surgery  
Thoracic Surgery  
Vascular Surgery  
Pediatric General Surgery

### MORNING SESSION

0800-0815	Introductory Welcome - Dr. Stephen Chung	
0815-0830	Dr. Sharadh Sampath, RIV (General Surgery) <i>An 18-Year Review of Open and Laparoscopic Splenectomy for Idiopathic Thrombocytopenic Purpura</i> ✚ Discussant: Dr. Scott Cowie, RV	Page 1
0830-0845	Dr. John Boutros, RIII (General Surgery) <i>Defining the Role of Minimally Invasive Surgery in the Treatment of Neuroblastoma</i> ✚ Discussant: Dr. Connie Chiu, RII	Page 2
0845-0900	Dr. Todd Swanson, RIII (General Surgery) <i>Apnea Frequency in Premature Infants Having Inguinal Hernia Repairs at a Major Tertiary Canadian Pediatric Hospital</i> ✚ Discussant: Dr. Matt Robinson, RIII	Page 3/4
0900-0920	Dr. Shaun Deen, RIII (General Surgery) <i>Anaplastic Thyroid Carcinoma Exhibits Intratumoral Molecular Homogeneity</i> ✚ Discussant: Dr. Scott Ainslie, RIV	Page 5
0920-0935	Dr. Christian Finley, RV (General Surgery) <i>Empyema: An Increasing Concern in Canada</i> ✚ Discussant: Dr. Elena Vikis, RV	Page 6
0935-0950	Dr. Susan Krajewski, RII (General Surgery) <i>The Impact of Computed Tomography Scanning of the Abdomen on Clinical Outcomes in Patients with Acute Right Lower Quadrant Pain - A Systematic Review of the Literature</i> ✚ Discussant: Dr. Jeff Doyle, RIV	Page 7
0950-1005	Dr. Robert Baird, RV (General Surgery) <i>Outcome Predictors In Congenital Diaphragmatic Hernia</i> ✚ Discussant: Dr. Tracy Scott, RIV	Page 8

1005-1025	<b>Coffee</b>	
1030-1045	Dr. Clara Tan, RI (General Surgery) <i>Development of Quantitative Modelling of Surgical Motor Actions to Assess Motor Performance in Minimally Invasive Surgery (MIS)</i> ✚ Discussant: Dr. Nicole Robbins, RIII	Page 9
1045-1100	Dr. Michael Goodwin, RII (General Surgery) <i>Improving Post-Discharge Care for the Homeless Patients</i> ✚ Discussant: Dr. Jason Faulds, RI	Page 10
1100-1110	Discussion of AM presentations, Dr. Chris Moir	
1115-1200	Dr. Christopher Moir, Department of Surgery, Division of Pediatric General Surgery, Mayo Clinic, Rochester, Minnesota. Visiting Professor of the Royal of Physicians and Surgeons of Canada <i>Surgical Research: The Patient Comes First</i>	
1205-1400	<b>ALUMNI LUNCHEON</b> <b>Medical Student &amp; Alumni Centre (MSAC)</b> <b>2750 Heather Street</b>	

## AFTERNOON SESSION

1405-1420	Dr. Jessica Mills, RIV (General Surgery) <i>Quality of Life Following Surgical Repair for Hirschsprung's Disease</i> ✚ Discussant: Dr. Mark Dickeson, RIII	Page 11
1420-1435	Dr. Joe Chan, RIV (General Surgery) <i>Surgical Residency Training in West Africa</i> ✚ Open Discussion	Page 12
1435-1450	Dr. Jin-Si Pao, RIII (General Surgery) <i>The Spatial Epidemiology of Violence-Related Injury in a Large Canadian City</i> ✚ Discussant: Dr. Peter Kim, RV	Page 13
1450-1505	Dr. Maja Segedi, RII (General Surgery) <i>Emergency Surgery Outcomes Study: Effects of Timing on Patient Outcomes in a Tertiary Hospital</i> ✚ Discussant: Dr. Sonya Baik, RI	Page 14
1505-1525	Dr. Monica Langer, RIV (General Surgery) <i>Preliminary Results of the Pediatric Trial of Euglycemia in Cardiac Surgery</i> ✚ Discussant: Dr. Hannah Piper, RV	Page 15

- 1525-1540 Dr. Adrienne Melck, RIV (General Surgery) Page 16  
*Mortality From Differentiated Thyroid Cancer in  
British Columbia: Patient Clinicopathologic and Treatment  
Characteristics*  
✚ Discussant: Dr. Andrew Schumacher, RV
- 1540-1555 Sarah Lord, RII (General Surgery) Page 17  
*The Epidemiology of Pedestrian Trauma In A Large Urban  
Environment: A 5-Year, Population-Based Study*  
✚ Discussant: Dr. Court Babcock, RI
- 1555-1605 Discussion of PM presentations – Dr. Chris Moir

**RESIDENTS' & ALUMNI DINNER**  
***Vancouver Lawn Tennis and Badminton Club***  
***1630 West 15<sup>th</sup> Avenue***  
***Reception 1830 hrs***  
***Dinner 1930 hrs***

## AN 18-YEAR REVIEW OF OPEN AND LAPAROSCOPIC SPLENECTOMY FOR IDIOPATHIC THROMBOCYTOPENIC PURPURA

Sharadh Sampath, M.D.<sup>a,e</sup>, Adam T. Meneghetti, M.D.<sup>a,e</sup>, John K. MacFarlane, M.D.<sup>b</sup>,  
Nam H. Nguyen, M.D.<sup>c</sup>, W. Barrett Benny, M.D.<sup>d</sup>, Ormond N.M. Panton, M.D.<sup>b,e</sup>,

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<sup>e</sup>*Departments of Surgery and General Surgery, Vancouver General Hospital Site, Vancouver, British Columbia, Canada*

### **Background:**

Laparoscopic splenectomy has become the preferred surgical procedure for the management of idiopathic thrombocytopenic purpura (ITP). However, no studies have directly compared the incidence of recurrent ITP secondary to missed accessory spleens in open versus laparoscopic splenectomy.

### **Methods:**

Open and laparoscopic splenectomies performed for ITP at 4 sites over 18 years were analyzed. The incidence of recurrent disease secondary to missed accessory spleens was compared between the open and laparoscopic splenectomy groups.

### **Results:**

A total of 105 splenectomies (54 open/51 laparoscopic) were performed. Accessory spleens were identified in 6 laparoscopic and 6 open cases ( $P = 0.57$ ). Recurrent disease occurred in 27.6% of open and 14.6% of laparoscopic cases ( $P = 0.222$ ). There were no cases of recurrent ITP secondary to a missed accessory spleen in either group.

### **Conclusions:**

The incidence of missed accessory spleens causing recurrent disease is similar when splenectomy is performed either open or laparoscopically.

## **DEFINING THE ROLE OF MINIMALLY INVASIVE SURGERY IN THE TREATMENT OF NEUROBLASTOMA**

John Boutros MD; \*Mason Bond MD, FRCSC; Paul Beaudry MD, FRCSC; Geoffrey K. Blair MD, FRCSC; Erik D. Skarsgard MD, FRCSC

From the Divisions of Pediatric General Surgery and \*Pediatric Haematology/Oncology, British Columbia Children's Hospital, and the Departments of Surgery and \*Pediatrics, University of British Columbia

### **Background:**

Neuroblastoma (NB) is the commonest extracranial solid tumour of childhood. Surgical resection of the primary site or risk-stratifying biopsy for advanced stage disease are essential elements of multimodal treatment. The objective of this study is to compare outcomes of treatment for patients undergoing MIS compared to open surgical treatment of primary tumour, and to derive selection criteria for safe and efficacious MIS treatment.

### **Methods:**

A single institution retrospective cohort study of all patients with NB who underwent surgical resection (MIS or open) of their primary tumor between July 1, 2003 and June 30, 2006 was conducted. The outcome measures included surgical complications (including need for conversion to open procedure), completeness of resection, event-free and overall survival, and duration of follow-up.

### **Results:**

Of 21 children (12 males, mean age 2 years) who underwent surgical resection of a primary NB, MIS techniques (laparoscopic or thoracoscopic) were used in 8 (38%). There were no significant differences in either patient or tumour characteristics between groups. A complete resection of the primary tumour was achieved in all patients in the MIS group, and in 11 of 14 (79%) in the open surgery group. Perioperative complications occurred in 4 patients (29%) in the open surgery group versus no complications and no conversions in the MIS group. Three patients (21%) in the open surgery group and none of the patients in the MIS group had persistent or recurrent disease at mean follow-up of 14 months.

### **Conclusion:**

MIS treatment of NB can be safely performed, with outcomes comparable to those achieved using open surgery, provided MIS patients are carefully selected on the basis of tumor size and encapsulation.

## **APNEA FREQUENCY IN PREMATURE INFANTS HAVING INGUINAL HERNIA REPAIRS AT A MAJOR TERTIARY CANADIAN PEDIATRIC HOSPITAL**

Todd Swanson MD; Jim Murphy MD, FRCSC; Mark Ansermino MD, FRCP; Ruth Milner, MD

Division of Pediatric General Surgery, Department of Anesthesia, Ruth Milner, Department of Biostatistics; BC Children's Hospital ; University of British Columbia, Vancouver, BC

### **Background:**

30% of premature infants develop inguinal hernias. Inguinal hernias are associated with incarceration and strangulation of inguinal and abdominal organs and repair is recommended early in life.

Post operative apneas are a complication of anesthesia in premature infants. Three varieties of apneas occur: obstructive, central and mixed. These apneas are associated with arterial hemoglobin oxygen desaturations, reflexive bradycardias and occasional cardiopulmonary arrest. Postoperative apneas have been reported in up to 31% of patients who undergo general anesthesia. The risk of this apnea is known to decrease with increasing post conception age (PCA) and gestational age (GA) at birth. Spinal anesthesia in premature infants has lower rates of apnea (4.9%) and occurs in infants with history of apnea.

Current practice at BC Children's Hospital is to monitor for apneas in all postoperative infants who are premature (<37 wks GA) and less than 60 weeks post conception age for at minimum one overnight stay in an ICU setting. At BCCH the majority of inguinal hernia repairs are performed on premature infants using combined caudal (spinal equivalent) and general anesthetic. The incidence of apneas using this combined anesthetic approach has not been reported.

### **Method:**

A Retrospective chart review will be conducted with inclusion criteria being infants: < 37 weeks GA admitted to the ICU for apnea monitoring. Records will be reviewed for all apnea events lasting over 15 seconds (as would be recorded by chest wall impedance) or bradycardia events (<80bpm) which would indicate obstructive apnea. Anesthesia records were reviewed for technique and medications given. Past Medical Records will also be reviewed for possible risk factors.

### **Results:**

4.8% of 126 Premature infants with inguinal hernia repairs of PCA<62 weeks had apnea events between 2001 and 2006. All these infants had past history of apneas compared to only 33% of the infants who did not have apneas. Infants who had postoperative apneas were ten times as likely to have history Intraventricular hemorrhage, 2.6 times as likely to have history of bronchopulmonary dysplasia and 3.1 times as likely to be ASA scores 3 or 4. The infants with apneas had lower birth weights (1.08 kg, SD .36 vs. 1.73, SD .75) and weights at the OR (3.37 kg, SD 1.17 vs. 4.4, SD 1.2). Apnea infants also had longer hospitalizations as neonates, longer courses of oxygen therapy and mechanical ventilation. Apneas infants had younger gestational ages but interestingly did not have younger post conception age at surgery; this likely is due to one outlying patient.

**Conclusion:**

Combined General and Caudal Anesthetic in Premature Infants have an incidence of apnea similar to spinal anesthetic alone. Infants with prior history of apneas, IVH and PDA appear to be those mainly at risk. Smaller birth weight, OR weight, gestation age, and longer more complicated neonatal hospital courses were more common in the apnea group as well. Sevoflurine and Narcotics in the OR are also associated with postoperative apneas.

Costly ICU monitoring for postoperative apnea could be more focused on infants at risk, based on this and previous studies. Further Data needs to be accrued to raise the evidence that modern anesthetic technique has a low risk of apnea in selected premature infants.

## **ANAPLASTIC THYROID CARCINOMA EXHIBITS INTRATUMORAL MOLECULAR HOMOGENEITY**

Shaun Deen MD; Obi L. Griffith BSc; Hamid Masoudi MD; S. Wiseman MD, FRCSC

Department of Surgery, University of British Columbia, Vancouver, BC

### **Background:**

Anaplastic thyroid cancer is a rare lethal endocrine malignancy. The objective of this work was to determine if molecular heterogeneity exists between different intratumoral histologic subtype foci of anaplastic thyroid carcinoma.

### **Methods:**

A tissue microarray composed of 12 anaplastic thyroid carcinoma samples from 6 patients (two discrete histologic subtype foci each) were evaluated for expression of 51 different molecular markers. Significant associations between marker staining and focus (primary versus secondary) or subtype (epithelioid, giant cell, or spindled) were determined using a Fisher's exact test. Marker scores were grouped as either 'negative' (score = 0) or 'positive' (score  $\geq$  1). The samples and markers were clustered using a hierarchical clustering algorithm and heatmaps generated. Correlation between marker staining for the two foci was also assessed for each patient using a Spearman correlation. All tests were two-tailed and considered significant at  $\alpha=0.05$ . Statistics were performed with SPSS software (SPSS Inc, version 13).

### **Results:**

No significant associations were found between intratumoural focus or subtype and marker expression. However, significant correlations were observed between overall staining patterns for paired foci from the same patient. This suggests that the different tumors showed consistent or homogeneous staining. The Spearman correlations ranged from 0.514 to 0.937 when comparing the 2 foci for each of the 6 patients. All P-values were less than 0.004 and considered significant. On the heatmap, the two foci from the same patient consistently clustered together suggesting intratumoral molecular homogeneity when comparing the intratumoral foci.

### **Conclusions:**

Few studies have evaluated molecular marker expression patterns of different histologic subtypes of anaplastic thyroid cancer. Despite being phenotypically heterogeneous, our findings suggest that anaplastic thyroid carcinoma exhibits intratumoral molecular homogeneity. This is supported by the statistically significant correlations observed between overall staining patterns for paired foci from the same patient. These results support the utilization of anti-cancer agents that target the molecular characteristics of this fatal thyroid malignancy.

## EMPHYEMA: AN INCREASING CONCERN IN CANADA

Christian Finley MD, MPH; Joanne Clifton MSc; Mark Fitzgerald MD; John Yee MD, FRCSC

Department of Surgery, University of British Columbia, Vancouver, BC

### **Background:**

Empyema is a suppurative infection of the pleural space. Without prompt treatment it can result in significant hospital stays, increasingly invasive treatments and substantial morbidity and mortality.

### **Objectives:**

The primary objective of this study is to evaluate if there has been an increasing incidence of empyema in Canada. Secondly we investigate if this increase is disproportionately affecting any age group.

### **Methods:**

The Discharge Abstract Database (DAD) of CIHI was used to evaluate national empyema data.

### **Results:**

There were 11,294 patients identified with empyema over the 9 years of this study, 31% of whom were women. The mean length of stay (LOS) was stable throughout the study at 21.82±33.88 days with a median LOS of 14 days. Of patients who were discharged 63.4% went home. The crude incidence rate ratio (IRR) from 1995 to 2003 for medical empyema increased significantly 1.30 (95% CI=1.20-1.41) ( $p<0.001$ ), as did empyema of unknown cause 1.29 (95% CI=1.08-1.54) ( $p=0.005$ ), while surgical empyema did not appear to increase 1.17 (95% CI=0.97-1.43) ( $p=0.114$ ).

Poisson regression showed an increase in the indirect age standardized IRR for medical empyema by 1.025 (95% CI=1.018 - 1.032) ( $p<0.001$ ). The IRR for patients age <19 from 1995 to 2003 was 2.20 (95% CI=1.56-3.10), while in those older than 19 it was 1.23 (95% CI=1.14-1.34) which was statistically different ( $p<0.001$ ).

### **Conclusions:**

This study demonstrates the increasing rate of empyema in Canada and shows a changing pattern of disease. The disproportionate rate change in the pediatric population suggests a high risk group that needs to be addressed. In the adult population, while cause is unknown, it is necessary to continually educate front line physicians to confront both the increased burden of this disease, caused by an aging population, as well as the underlying increasing rate of empyemas in this country.

## **THE IMPACT OF COMPUTED TOMOGRAPHY SCANNING OF THE ABDOMEN ON CLINICAL OUTCOMES IN PATIENTS WITH ACUTE RIGHT LOWER QUADRANT PAIN – A SYSTEMATIC REVIEW OF THE LITERATURE**

Susan Krajewski MD<sup>1</sup>, Jackie Brown MD, FRCPC<sup>2</sup>, P.Terry Phang MD, FRCSC<sup>1</sup>, Manoj J. Raval MD, FRCSC<sup>1</sup>, Carl J. Brown MD, FRCSC<sup>1</sup>.

Departments of Surgery<sup>1</sup> and Radiology<sup>2</sup>, University of British Columbia, Vancouver, BC

### **Background:**

Abdominal computed tomography (CT) scans have been shown to be both sensitive and specific in the diagnosis of acute appendicitis. However, the impact of abdominal CT scans on clinical outcomes remains unclear. The purpose of this study is to evaluate the impact of abdominal CT scanning on clinical outcomes in adults presenting with acute right lower quadrant (RLQ) pain.

### **Methods:**

A systematic review of the literature (MEDLINE, EMBASE and Cochrane databases) was conducted to identify studies that assessed the impact of CT scan on appendicitis outcomes. Of 560 potentially relevant articles published between January 1988 and March 2007, 33 retrospective and prospective studies met our inclusion criteria: studies of adult patients with acute RLQ pain that evaluated the use of abdominal CT scans on one of the following clinical outcomes: negative appendectomy, perforation, and time to the OR.

### **Results:**

Negative appendectomy rates were evaluated in 28/33 (85%) studies; 15 of these studies showed a significant decrease negative appendectomy rates with increased use of CT scans and the remaining studies showed no significant difference. Appendiceal perforation rates were evaluated in 14/33 (42%) of the studies though. Only 3 studies demonstrated a significant increase in perforation rates with the increased use of CT scans. Time to the OR was evaluated in 7/33 (21%) studies: 4 of these studies demonstrated a significant increase in the time to OR with the increased use of CT scans.

### **Conclusions:**

The use of abdominal CT scans in the evaluation of patients presenting with acute RLQ pain has demonstrated a significant decrease in negative appendectomy rates without a significant increase in perforation rates or time to the OR.

## OUTCOME PREDICTORS IN CONGENITAL DIAPHRAGMATIC HERNIA

Robert Baird MD<sup>1</sup>, Macnab Ying<sup>2</sup> PhD; Skarsgard E MD, FRCSC<sup>1</sup>

<sup>1</sup>Department of Pediatric Surgery, <sup>2</sup>Department of Health Care and Epidemiology  
University of British Columbia, Vancouver, BC

### Background:

A validated risk stratification tool for Congenital Diaphragmatic Hernia (CDH) is required for accurate outcomes analysis. Previously derived outcome predictors include:

- Gestational Age alone (GA)
- CDH Study Group: birth weight/ 5 minute apgar;
- Canadian Neonatal Network (CNN): Score for Neonatal Acute Physiology (SNAP-II)
- Combined score (GA + SNAP-II)

The purpose of this study was to evaluate the calibration and discrimination of these outcome predictors using the Canadian Pediatric Surgical Network (CAPSNET) dataset.

### Methods:

Prospective data was collected in 16 pediatric centers over a 2 year period. Differences in scores between survivors and non-survivors were compiled, and bivariate analysis of mortality was performed. Discrimination and calibration of predictors were compared.

### Results:

13 of 70 (19%) infants with CDH died during their birth hospitalization. Discrimination and calibration performance of outcome predictors varied:

Variable	GA	CDHSG model (birth weight + Apgar)	SNAP-II	Combined model (GA+ SNAP-II)
AUC	0.559	0.85	0.787	0.784
$\chi^2$	1.195	6.543	5.657	12.267
H-Lp	0.945	0.478	0.463	0.14

AUC: Area Under Curve

### Conclusion:

Using the CAPSNET dataset, the prediction of mortality by the combined model is less robust than with the CNN dataset. Compared to the CDHSG equation, the combined model offers equivalent calibration but poorer discrimination.

## **DEVELOPMENT OF QUANTITATIVE MODELLING OF SURGICAL MOTOR ACTIONS TO ASSESS MOTOR PERFORMANCE IN MINIMALLY INVASIVE SURGERY (MIS)**

Tan-Tam, Clara C. MD/PhD\*; Cristancho, Sayra M. PhD candidate<sup>1</sup>; Panton, O. M. Neely MD FRCS C\*; Meneghetti, Adam MD, FRCS C\*; Warnock, Garth MD, FRCS C\*; and Hodgson, Antony PhD<sup>1</sup>.  
Department of General Surgery\* and Department of Mechanical Engineering<sup>1</sup>  
University of British Columbia

### **Background:**

Surgical competence involves knowledge, judgment, communication and technical dexterity. Current evaluation methodologies to assess the surgical motor skills remain mostly subjective. Present research on technical skills assessment in laparoscopic surgery has been performed on simulators, which only analyze generic motor skills, and scoring of the overall performance have been based on surgeons' opinions. Cristancho et al have developed a hierarchical motor/cognitive modelling approach which not only incorporates performance measures, such as, time, and tool kinematics, but also symbols which represent particular surgical tasks in a defined setting. This accounts for the variability from one procedure to another and facilitates making comparisons across procedures in the evaluation. Preliminary quantitative kinematic data obtained from results in a dry-lab based pilot study completed by Cristancho et al. validated that their modelling method indicates good intrasubject repeatability, intragroup consistency and intersubject difference (Cristancho et al., 2006); however it is unknown whether these results will hold for the live operating room situation. Therefore, the objective of the present study, which is presently at the data collection stage, is to test whether this proposed analytical method can distinguish between novice and expert surgical skills performing in the operating room.

### **Methods:**

We will acquire motor performance data on laparoscopic cholecystectomy procedures from subjects at the beginning of their training (3<sup>rd</sup> /4<sup>th</sup> year general surgery residents), and experts (Attending surgeons) at the University of British Columbia Hospital. The performances will be videotaped, and the movements recorded by a Polhemus Fastrak magnetic sensing system. A 6-element vector is used to define the kinematic measures that will be extracted from the tasks. To simplify the presentation of the data to the trainer, the Principal Components Analysis (PCA) will be used to extract the two dominant contributors (vectors) to overall variability. The surgical tasks will be analyzed in order to determine the type and duration of basic movements. Statistical analysis will involve computation of the average tool tip kinematics in each of the 3 cardinal directions for each of the principle tasks of procedure. The series of tasks will be represented as symbols and subjected to a scoring system to evaluate a procedure. These procedure models will be further analyzed to assess the difference between the two groups of surgeons.

### **Future Directions:**

This project will provide us with a basis to conduct a larger intraoperative study, and to adapt this to other laparoscopic surgeries, in order to test if the proposed methodology may be incorporated into the evaluation process of the surgical residency curriculum.

## IMPROVING POST-DISCHARGE CARE FOR HOMELESS PATIENTS

Goodwin, Michael MD; Lysyshyn, Mark, MD, MPH, FRCPC

Division of General Surgery and Division of Internal Medicine, St. Paul's Hospital,  
University of British Columbia, Vancouver, BC

### **Background:**

The number of homeless people in the Greater Vancouver area has risen dramatically in recent years to over two thousand individuals. Surgical services commonly encounter these individuals because they suffer chronic disease, infection and trauma at rates much higher than the general population. Homeless patients often require longer hospital stays and this poses a significant cost to the health care system. One of the main factors that increase their length of stay is that they lack a suitable discharge environment. Improving post-discharge care for homeless individuals may improve health outcomes by reducing length of stay and readmission rates.

### **Methods:**

The purpose of this health advocacy project is to explore ways to improve post-discharge care of homeless patients in Vancouver. The questions of this project are: What is the current state of post-discharge care in Vancouver? What are possible solutions to this problem? What is the feasibility of implementing these solutions? An outline for this process is as follows:

1. Conduct a literature review of the issue of homelessness as it relates to use of health services and health outcomes as well as the issue of post-discharge care.
2. Identify all stakeholders involved with post-discharge care of homeless patients at Vancouver Coastal Health, Vancouver hospitals, homeless shelters, and the Greater Vancouver Regional District.
3. Conduct structured key informant interviews with stakeholders and members of the target homeless population to seek out their opinions on the issue and its solutions.
4. Propose a plan for the implementation of the most feasible solutions based on the outcomes of this process.

### **Preliminary Results:**

A growing body of literature demonstrates markedly higher rates of morbidity and mortality in the homeless population. Research in the Vancouver area documents a considerable rise in homelessness in recent years. Post-discharge care does exist in Vancouver and is currently provided in the Downtown Eastside homeless shelters in conjunction with Community Health Clinics. This approach has advantages and disadvantages. Local providers and administrators involved in health care for the homeless agree more resources should be allocated to this issue.

### **Conclusions:**

Homelessness is a very significant problem in Vancouver and is an independent predictor of worsened health outcomes. Structured interventions for homeless patients at time of discharge have been shown to be beneficial in other centres and may prove as useful models in Vancouver. Surgeons have an opportunity to engage the public health process and advocate for resources on behalf of the homeless population.

## THE QUALITY OF LIFE IN CHILDREN FOLLOWING SURGICAL REPAIR FOR HIRSCHSPRUNG'S DISEASE: FROM TODDLERDOM TO YOUNG-ADULTHOOD

Jessica L.A. Mills MD; David E. Konkin MD; Janice G. Penner MD, FRCPC; Monica Langer MD; Eric M. Webber, MD, FRCSC

Division of Pediatric General Surgery, British Columbia Children's Hospital and the University of British Columbia, Vancouver, B.C.

### **Background/Purpose:**

Little is known about the quality of life of children with Hirschsprung's disease as they grow older. The purpose of this study was to measure the quality of life (QOL) and bowel function of these children as they mature.

### **Methods:**

All children who were surgically treated for Hirschsprung's disease at BC Children's Hospital between 1986 and 2003 were invited to participate. Each family was sent three previously validated questionnaires exploring current QOL and bowel function.

### **Results:**

Fifty one families participated (63%). Both constipation and fecal continence were significant predictors of overall QOL in the univariate analysis. In the multivariate analysis only fecal continence and gender were significantly associated with overall QOL scores but subscale analysis showed a significant relationship between increasing age and improved psychosocial QOL. Age was not predictive of QOL in either univariate or multivariate analysis.

### **Conclusions:**

Fecal continence and not age is the most important predictor of overall QOL of children surgically treated for Hirschsprung's disease. Although the physical impact of incontinence affects all age groups, older children appear to compensate for their physical limitations and achieve a relatively higher psychosocial QOL. Our study indicates that interventions for children with incontinence may offer gains in QOL as well as bowel function.

## TRAINING REQUIREMENTS FOR INTERNATIONAL SURGERY: A 10-YEAR REVIEW OF CASES PERFORMED IN A DEVELOPING-WORLD TEACHING HOSPITAL

JE Chan, MD<sup>1</sup>; KM Chan, BScN; NE Cleek, MD<sup>2,3</sup>; EM Webber, MD<sup>1</sup>; SM Hameed, MD<sup>1</sup>

<sup>1</sup>Department of Surgery, University of British Columbia

<sup>2</sup>Department of Surgery, Loma Linda University School of Medicine

<sup>3</sup>Pan-African Academy of Christian Surgeons, Cameroon, West Africa

### **Background:**

*International surgery is a rapidly growing area of interest. An increasing number of surgical residents are spending time in developing-world medical centres, but little guidance is available for adequate preparation. A better understanding of the scope of international surgery will improve both visiting resident and receiving hospital satisfaction.*

### **Methods:**

The Banso Baptist Hospital in Cameroon serves as a training site for the Pan-African Academy of Christian Surgeons (PAACS), an accredited, four-year surgical residency training program in West Africa.

An on-site retrospective review of the Operating Room records was conducted, covering the 10-year period between 1997-2006. Data on patient demographics and diagnosis, surgical procedure and subspecialty, primary surgeon, and urgency was collected. The PAACS educational guidelines were reviewed and compared to the operative caseload, as well as to the training requirements of the average Canadian general surgery residency program.

### **Results:**

A total of 17,363 major cases were performed over the 10-year review period. Overall, General Surgery (6658 cases, 38.3%), Gynecology (4062, 23.4%), and Obstetrics (2709, 15.6%) constituted the majority of cases.

Elective cases totaled 13397 (77.2% of total cases); of these, General Surgery (5436 cases, 40.6%), Gynecology (3593, 26.8%), Orthopedics (1586, 11.8%), and Urology (1220, 9.1%) were the most commonly involved subspecialties. Of the 3966 emergency cases, procedures in Obstetrics (1936 cases, 48.8%) and General Surgery (1224, 30.9%) were most frequently performed. Caesarian-sections accounted for 97.0% of Obstetrical emergencies.

Current PAACS surgical education guidelines are heavily weighted on General Surgery training (72 weeks, 38.6% total time), with a secondary emphasis on Gynecology, Orthopedics, and Urology (average 26 weeks training each, 13.9%).

### **Conclusions:**

International surgery encompasses a wide scope of surgical expertise, extending beyond the usual North-American training curriculum. Residents should be familiar with performing Caesarian-sections. Additional electives in sub-specialties such as Gynecology, Orthopedics, or Urology may also better prepare general surgery residents for international surgery, providing a more mutually beneficial and satisfying elective experience.

## THE SPATIAL EPIDEMIOLOGY OF VIOLENCE-RELATED INJURY IN A LARGE CANADIAN CITY

Pao, J-S<sup>1</sup>, Hameed, SM<sup>1</sup>, Schuurman, N<sup>2</sup>, Brasher, P<sup>3</sup>, Tsang, B<sup>4</sup> Williams, D<sup>5</sup>, Lakha, N<sup>5</sup>, Taulu, T<sup>6</sup>, Evans, DC<sup>1</sup>, Brown, DRG<sup>1</sup>, Doucet, JJ<sup>1</sup>, Simons, RK<sup>1</sup>

<sup>1</sup>Department of Surgery, University of British Columbia; <sup>2</sup>Department of Geography, Simon Fraser University; <sup>3</sup>Center for Clinical Epidemiology and Evaluation, Vancouver Coastal Health; <sup>4</sup>Faculty of Medicine, University of Western Ontario; <sup>5</sup>British Columbia Trauma Registry and <sup>6</sup>Trauma Services, Vancouver Coastal Health

### **BACKGROUND:**

In resolution 49.25, the World Health Assembly recognized violence as a leading worldwide public health problem, and urged member states to take steps to assess the problem and develop measures to prevent it. The Canadian Public Health Association adopted this resolution in 2004. To assess the distribution and determinants of violence related injury (VRI) in Vancouver (including societal and environmental risks), population-based and spatial analyses were conducted using trauma registry and census data.

### **METHODS:**

The BC Trauma Registry captures traumatic events requiring at least 3 days of hospitalization. The Registry was accessed for the years 2001-2005 inclusive, and data for patients living in the Greater Vancouver Regional District (GVRD) with an ICD-10 code for VRI were retrieved. Registry data were linked with census data in the determination of population based incidence rates, and to measure the effect of societal and geographic factors on injury risk.

### **RESULTS:**

VRI accounted for 10.8% (411/3823) of all severe injuries in the GVRD during the study period. The majority of patients were 20 to 40 year old (50.9%) males (93.2%). The City of Vancouver contributed the highest number of cases of all municipalities (169 or 41.1%) while the smaller municipalities had the highest incidence rate of VRI (59.7 cases/year/100,000 population). Spatial analyses demonstrated variations in neighbourhood and street level risk.

### **CONCLUSIONS:**

Few studies have characterized the population-based epidemiology of violence. Incidence rates of severe VRI are high in Vancouver and are likely substantially underestimated by this study. Regional variations in incidence rates suggest that geographic and societal factors play a role in VRI risk and that specific, community-based prevention strategies may be needed.

## EMERGENCY SURGERY OUTCOMES STUDY: EFFECTS OF TIMING ON PATIENT OUTCOMES IN A TERTIARY HOSPITAL

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### **Objectives:**

Our objective is to determine the influence of delays in the initiation of urgent laparotomy for peritonitis on patient morbidity. We hypothesize that the delays in emergent laparotomy beyond the designated operating room (OR) priority time result in significantly worse patient outcomes.

### **Method:**

This is a retrospective cohort study of all adult patients undergoing non-trauma laparotomy for peritonitis within 48 hours of triage in the emergency department in a Canadian Tertiary Hospital between Jan 2005 and Jan 2007. Data collection is performed from databases maintained by medical records, the OR and the intensive care unit (ICU).

Patients will be assigned to two groups: patients in whom surgery was initiated within the time deemed medically appropriate by the surgeon (MA) and patient whose surgery was delayed beyond this medically appropriate time frame (DMA). The primary outcome variable is MODS-free days. Secondary outcome variables are hospital and 30-day mortality, ventilator-free days, repeat laparotomy, and surgical complications.

Complications include surgical site infections, open abdomen management, urinary tract infections, line infections, venous thromboembolic event, and myocardial infarction. A logistic regression model will be used to control for factors known to influence the primary outcome (e.g. age, Charlson comorbidity index, APACHE II score, adequacy of resuscitation). Adequacy of resuscitation was defined as the presence of one or more of the following features preoperatively: adequate urine output within 2 hours of surgery, most recent base excess  $< 2$  mmol/L, insertion of a central line, infusion of  $> 2$ L volume resuscitation. Delay to surgery was defined as completion of laparotomy outside the time window proscribed by the assigned emergency OR booking category.

### **Results:**

We report on the outcomes of approximately 200 general surgery patients undergoing emergency laparotomy. We found (no) significant correlation between time to laparotomy and the risk-adjusted occurrence of multiple organ failure. A data collection model is proposed for a future emergency surgery clinical outcomes database.

**Conclusions:** TBD

## PRELIMINARY RESULTS OF THE PEDIATRIC TRIAL OF EUGLYCEMIA IN CARDIAC SURGERY

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### **Background:**

Critically ill neonates and children commonly develop stress hyperglycemia which is significantly associated with increased morbidity and mortality. In critically ill adults several clinical trials have found that tight glycemic control with intravenous insulin therapy decreases morbidity and mortality, primarily through decreased incidence of sepsis. The recent development and validation of continuous glucose monitoring now allows safe administration of insulin to critically ill children with minimized risk of severe hypoglycemia. We hypothesize that we can safely normalize and tightly control of blood glucose concentrations (4.4 – 6.0 mmol/L) following pediatric cardiac surgery and that this intervention will decrease early postoperative morbidity when compared to current standard of care management.

### **Methods:**

A single-center prospective randomized controlled trial employing continuous glucose monitoring and insulin infusion to maintain euglycemia in post-operative pediatric cardiac surgery patients less than three years of age. The first 10 patients were reviewed to determine the safety and efficacy of the insulin infusion protocol and continuous glucose sensors. Differences in serum glucose concentration were compared with Mann Whitney U test.

### **Results:**

Five standard of care (SOC) (median age 3.4 mo) and five tight glycemic control (TGC) (median age 2.9 months) were enrolled. Median glucose during the study was 6.9 mmol/L (SOC) and 5.6 mmol/L (TGC), ( $p>0.05$ ). Duration of arterial line was 92.75 hours (range: 23.67 - 182.78) for the SOC group and 44.0 hours (range: 19.92 - 83.00) for tight glycemic control. There were no major adverse events related to the protocol.

### **Discussion:**

Preliminary data from the first 10 patients demonstrates safe and effective administration of insulin infusions in infants and children in the ICU post cardiac surgery. Completion of enrollment is required to demonstrate if tight glycemic control improves post-operative recovery and decreases morbidity.

## MORTALITY FROM DIFFERENTIATED THYROID CANCER IN BRITISH COLUMBIA: PATIENT CLINICOPATHOLOGIC AND TREATMENT CHARACTERISTICS

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### Background:

Differentiated thyroid cancer (DTC) generally has a favorable outcome, yet there remain some patients who develop a recurrence and/or distant metastases and ultimately succumb to their disease. Various risk stratification systems attempt to combine a number of clinicopathologic variables to predict patient prognosis, however none represent a completely reliable method for predicting disease outcome, thus none has gained universal acceptance. In addition, the literature evaluating individuals who die from DTC has been limited. The aim of this study is to determine the clinicopathologic and treatment characteristics of individuals who die from DTC and to identify those variables most predictive of poor survival in a population-based cohort of fatal DTC cases.

### Methods:

All patients who died from thyroid cancer during the period 1985 and 2004 were identified in the population-based tumor registry of the British Columbia Cancer Agency (BCCA). Patients dying of medullary or anaplastic thyroid carcinoma were excluded from the study cohort. Data regarding patient demographics, clinicopathologic parameters and treatment characteristics were retrieved via chart review. The t test and Chi-square test were used to evaluate differences between PTC and FTC patients. Cox regression survival analysis was utilized to evaluate the impact of the various clinicopathologic parameters on survival.

### Results:

117 fatal DTC cases were identified during the 20-year period. There were 45 (38.5%) men and 72 (61.5%) women in the cohort. The mean age at diagnosis was 63.6 years, mean age at death was 71.4 years, and the mean length of survival was 89.3 months. Pathology included 65 PTCs, 38 FTCs, and the remaining 14 cancers included a mixture of Hurthle cell tumors and PTCs and FTCs with foci of anaplastic transformation. Regarding adjuvant therapies, 64.1% received radioactive iodine ablation, 88% received external beam radiotherapy, and 7.7% received chemotherapy. There was a trend toward younger age at death ( $p=.075$ ) and shorter mean length of survival ( $p=.067$ ) for the FTCs compared to the PTCs. Significantly more FTC patients received chemotherapy than PTC patients (13.2% vs. 1.5%,  $p=.025$ ). On univariate Cox survival analysis, age at diagnosis ( $p<.001$ ), history of previous thyroid disease ( $p=.041$ ), hemithyroidectomy as initial surgery ( $p=.002$ ), tumor size ( $p=.031$ ), incomplete resection ( $p=.043$ ), lack of TSH suppression ( $p=.002$ ) and lack of adjuvant radioactive iodine ablation ( $p=.003$ ) were associated with a decreased length of survival. On multivariate analysis, hemithyroidectomy as initial surgery ( $p=.01$ ), tumor size ( $p=.03$ ) and lack of radioactive iodine ablation ( $p=.01$ ) remained significant predictors of decreased survival.

**Conclusions:** Tumor size, initial surgical procedure and postoperative RAI are significant predictors of survival in patients with DTC. The results of our study suggest that treatment protocols for DTC should include total thyroidectomy and postoperative radioactive iodine ablation for all patients in order to improve survival.

## THE EPIDEMIOLOGY OF PEDESTRIAN TRAUMA IN A LARGE URBAN ENVIRONMENT: A 5-YEAR, POPULATION-BASED STUDY

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### BACKGROUND:

Pedestrian trauma (PT) is perceived to be an important problem in Vancouver. To measure the distribution and determinants of PT, including societal and environmental factors, population-based and spatial analyses were conducted using trauma registry and census data.

### METHODS:

The BC Trauma Registry captures traumatic events, requiring at least 3 days of hospitalization, throughout the province of British Columbia. The Registry was accessed for the years 2001-2005 inclusive, and data for patients living in the Greater Vancouver Regional District (GVRD) with an ICD-10 code for pedestrian trauma were retrieved. Census data were utilized for determination of population based incidence rates, and to measure the effect of societal and geographic factors on injury risk.

### RESULTS:

PT accounted for 8.5% (634/7474) of all severe injuries in the province during the period of observation. The GVRD contributed 48% of all injuries in the province, but 61% of PT. Within the GVRD, PT involved males and females almost equally (males 55%) and frequently resulted in severe injury (median injury severity score 26). The incidence rate for PT in the GVRD was 3.9 per 100 000 person-years (p-y), but varied considerably between age and geographic groups, with the highest rates occurring in 55-64 year olds (5.4 per 100 000 p-y), and in Vancouver proper (6.5 per 100 000 p-y) and New Westminster (9.5 per 100 000 p-y).

### CONCLUSIONS:

Incidence rates of PT are higher in the GVRD than for BC as a whole. Significant regional variations in incidence rates suggest that geographic and societal factors play a role in PT risk, and that community-based prevention strategies may be needed.