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Abstract Booklet

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UBC Life Sciences Centre
PREDICTING ANTHRACYCLINE-INDUCED CARDIOTOXICITY IN CHILDREN – GENOME-WIDE ASSOCIATION STUDY

Presenting Author(s): Cory Weissman *

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Keywords: anthracyclines, cardiotoxicity, childhood malignancies, genome-wide association study

Children receive anthracycline chemotherapy to treat a number of malignancies. A significant number of these patients develop cardiotoxicity as an adverse reaction to this treatment. Previously identified genetic markers for patients with anthracycline-induced cardiotoxicity (ACT) explain only a small fraction of the variability of this phenotype, suggesting the presence of other, as-of-yet unidentified genetic susceptibility loci. Therefore, our goal is to identify additional genetic markers with large effect size through a genome-wide association study (GWAS).

Patients were recruited and clinically characterized (age at start of treatment, cumulative dose, gender, anthracycline and tumor type, radiation therapy involving the heart, follow-up time and assessment of LV dysfunction) via the Canadian Pharmacogenomics Network for Drug Safety. Over 400 patients from across Canada were recruited and clinically characterized as our discovery cohort, and a further 120-plus patients from Emma Children’s Hospital in Amsterdam, the Netherlands, will be used in our replication cohort. More patients are currently being recruited and the clinical characterization is ongoing. We are now genotyping samples with an Illumina GWAS panel and the statistical analyses will soon be underway using SVS/Helix Tree, SPSS, Epi Info, PLINK and R.

Novel genetic predictors for ACT may prove to be essential in screening patients before the start of anthracycline treatment.

This work was supported by CIHR, CFRI, BCCGN and Genome BC.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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POSTOPERATIVE MONITORING FOR OPIOID-INDUCED RESPIRATORY DEPRESSION

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Keywords: postoperative monitoring, respiration,

Opioid medications are commonly used for postoperative pain management. A serious complication of opioids is respiratory depression, which can lead to significant morbidity and mortality if not detected early. Due to the different methods used for detection, the incidence of opioid-induced respiratory depression reported in the literature varies widely. Some studies involving continuous respiratory monitoring using pulse oximetry and capnography have reported an incidence of up to 40%. Patients with obstructive sleep apnea (OSA) are at increased risk for respiratory depression. These patients are more susceptible to the central depressive effects of opioids, which inhibit the normal arousal during periods of absent or decreased breathing seen in OSA. It is reported that up to 60% of patients admitted to the general medicine unit may have OSA, but many of them are undiagnosed. Preoperative screening using validated screening tools such as the STOP and Berlin questionnaires may be effective in identifying patients with OSA and who have a higher risk for opioid-induced respiratory depression. Postoperatively, non-ICU patients may be monitored on general wards with vital signs being checked at hourly intervals. Cases have been reported in the literature of patients who experienced respiratory arrest in between checks and were not recognized until the next scheduled check, thus delaying the time to intervention, which is critical, as respiratory arrest can lead to brain damage and death if not treated early. Continuous monitoring using electronic monitors that measure oxygenation and ventilation can allow for earlier and increased detection of respiratory depression. In addition, it is increasingly recognized that patterns of respiratory deterioration are more accurate and effective in detecting respiratory depression early compared to solely threshold-based monitoring. Thus, monitoring the trends of various parameters of respiratory status is more effective than monitoring a single parameter. Studies done by various institutions using continuous postoperative monitoring have demonstrated improved outcomes, including decreased rescue events, fewer ICU transfers, and increased cost savings. Currently, postoperative opioid-induced respiratory depression has been an important focus of organizations dedicated to patient safety and has led to the proposal that “No patient shall be harmed by opioid-induced respiratory depression.”

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TIME TO HIV VIRAL LOAD SUPPRESSION WITH COMBINED ANTIRETROVIRAL THERAPY (CART) IN PREGNANCY

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Keywords: HIV, pregnancy, suppression, viral load, combined antiretroviral therapy

Background: To prevent vertical transmission, the goal of antenatal cART is to achieve viral load suppression before delivery. Given the short duration of pregnancy and challenges in engaging in early prenatal care in this population, we sought to define the duration of treatment required for viral load suppression.

Methods: A retrospective cohort of a provincial perinatal HIV database from 1997 and 2011, was analysed including only those who had live birth, a detectable viral load in pregnancy and initiated cART in pregnancy. Data on demographics, parity, gestational age at treatment initiation and delivery, medication adherence, history and type of cART, weeks to viral suppression (defined as <250 copies/ml), smoking, illicit drug use and hepatitis C virus antibody positivity were collected. Non-parametric maximum likelihood estimates (NPMLE) for the distribution of suppression times were calculated. Factors associated with time to suppression were assessed using parametric survival analysis with a Weibull distribution.

Results: 161 mother-infant pairs met inclusion criteria and had complete data for modeling covariates. Mean gestational age at delivery was 37.8±2.47 (SD) weeks with only 10 women failing to achieve viral suppression by delivery (6.2%). The NPMLE revealed that 16.6% of women were suppressed after 2 weeks, 56.5% after 4 weeks, 62.7% after 6 weeks, 76.2% after 8 weeks, and 79.2% after 10 weeks of therapy. The median time to suppression was 3.8 weeks. The predicted proportions of women with suppressed viral loads (<250 copies/mL) vs. time since ART initiation revealed log_{10} viral load <4.06, age ≤ 25 year old, excellent and good cART adherence and no past cART use were all associated with shorter treatment durations.

Conclusion: Higher maternal viremia and maternal age at treatment initiation, prior cART use and poor adherence confers longer treatment time required to achieve viral suppression. Consideration for earlier and/or intensified cART therapy and enhanced adherence support in such women may reduce viral suppression failure.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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HEALTH CARE COMMUNICATION BARRIERS FOR IMMIGRANT AND REFUGEE WOMEN IN VANCOUVER

Presenting Author(s): Julie Berthin

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Keywords: health care communication, health care access, immigrants, refugees, women

Introduction: This study was part of a community outreach project to develop a workshop for a group of immigrant and refugee women in Vancouver. The target group was an African and Middle Eastern women’s support group at a local community organization. This project aimed to help participants learn how to access the Canadian health care system and communicate more effectively with doctors. This poster focuses on the needs assessment for this project, which explored the demand for the proposed workshop and identified the particular barriers faced by this group.

Methods: Methods included 6 qualitative interviews with key informants who provide services to this population, and surveys with the target group (n=19). The survey was conducted over two sessions (Part I and Part II) with the assistance of language interpreters. 14 participants completed both sections, and 5 participants completed Part I only. Interviews were audio-recorded, transcribed, and analyzed inductively using open-coding. Survey data were analyzed using SPSS.

Results: The interviews fleshed out the barriers to health care that this population faces. These included language and literacy barriers, a lack of familiarity with the Canadian health care system, and a lack of feeling comfortable with their doctors.

All survey respondents (19 / 19) indicated they would like to learn how to improve their communication with their doctor. Participants indicated they would most like to learn how to ask more questions to their doctors (5 / 14) and to describe symptoms (5 / 14). Few respondents (2 / 14) indicated they knew how to find or change their doctor if they wanted to.

Conclusions: This research highlights a need for the proposed workshop among the target group, and identifies themes that would be most useful. The workshop should include an overview of the Canadian health care system, such as the role of a family doctor and how to find one. Participants should also practice asking medical questions, describing symptoms, and making appointments. These skills will hopefully assist participants in accessing health care and communicating more effectively with doctors.

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ENGAGING THE NEXT GENERATION: SUSTAINABLE SOLUTIONS FOR GLOBAL HEALTH INEQUITIES

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Keywords: global health, youth, behaviour, health education

We are using the Theory of Planned Behavior (TPB) to evaluate an interactive educational workshop about the UN Millennium Development Goals (MDG) delivered to grade 8 students at two independent schools in Vancouver, York House and Crofton House. The goal of our presentation is to inspire youth to become more engaged with global health. We will also provide students with a handout outlining resources about global health. Our research question is: following the workshop will youth change their behavior to independently acquire new knowledge about global health? As such, we will evaluate if a change in specific behaviors will occur by administering a pre and post questionnaire. It is necessary to apply a theory to properly understand the underlying processes and factors that are required to change behavior. The TPB emphasizes that intention is required in order to change a behavior. Intention is influenced by attitude towards the behavior, subjective norms, and perceived behavior control. The questionnaire has been designed using the Likert scale and the responses will be given a number value. The survey score will be calculated before the workshop, T1, and after the workshop, T2. The difference between T2 and T1 will be calculated to evaluate the change in behavior, intention, attitude, subjective norms and perceived behavior control. The TPB has been used previously in a wide variety of studies to predict behaviors such as smoking, sexual behavior, exercise and food choices. It is important to establish the level of intention towards acquiring knowledge about global health that already exists among youth to guide future workshops and surveys.

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TRAINING THE PHYSICIAN-ADVOCATE: A COLLABORATIVE CUBAN-CANADIAN-AMERICAN-MEXICAN COLLOQUIUM ON MEDICAL EDUCATION

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Keywords: medical education, primary care, social accountability

Background
There is growing recognition that medical education needs to better prepare future physicians to be socially responsive in order to improve health outcomes. Medical schools are increasingly aware of the significant shortcomings in ways doctors are educated about the social contract between medicine and society. Cuba is an excellent example of educational reforms that has led to remarkable health outcomes and reductions in health disparities. This research aims to compare and contrast the countries’ respective ways in which their medical curricula teach physician social accountability.

Methods
The project took place over the summer of 2012 in Santa Clara, Cuba. We participated in a medical exchange with the Instituto Ciencias Medicas (ICM) to learn about the structure and function of the primary health care system. Interviews were conducted with various medical professors and epidemiologists. The inaugural international medical student colloquium was a 1-day event, co-sponsored by medical students from UBC, ICM, Universidad Veracruzana and Yale School of Medicine. Discussion will include presentations and focus groups on the teaching of physician advocacy and public health in medical education.

Results
Over the three-week medical exchange and throughout the colloquium, it became clear that development of physician social accountability is highly complex. Significant factors that vary between educational systems and have overt and subconscious influences on physician advocacy include: pre-medical requirements, admissions process, medical curriculum including philosophy, ethics, and rural service rotations, cost of attendance, overall student indebtedness, earning potential, and societal views and expectations of physicians.

Conclusions
The different ways in which students are taught social accountability has a profound impact on healthcare practice and patient care. Meeting with medical students from 4 separate and unique systems sheds light on valuable features that shape health care overall. Physician efficacy and clout is intricately linked to the medical system itself but also to other determinants as large as social values, economic practices, and political agendas. These findings from the inaugural international student colloquium on medical education sets an important precedent for future global collaborative projects and the open dialogue will be an important aspect of continued physician training and advocacy.

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VOLUME OVERLOAD IS ASSOCIATED WITH ACUTE KIDNEY INJURY AND ADVERSE OUTCOMES AFTER CARDIAC SURGERY

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Keywords: Acute kidney injury, volume overload, cardiac surgery

BACKGROUND: Acute kidney injury (AKI) is a common and serious complication following cardiac surgery that is associated with significant morbidity and mortality. Volume overload, both in the general surgical and critically ill populations, has been linked to adverse patient outcomes irrespective of the development of AKI. There is limited data on the influence of volume overload on patient outcomes following cardiac surgery. We hypothesized that volume overload after cardiac surgery would increase intensive care and hospital length of stay and may be associated with an increased incidence of AKI.

METHODS: A prospective, observational study was performed to investigate the impact of volume overload on the incidence of AKI and patient outcomes, including critical care and hospital length of stay. Elective patients undergoing either coronary artery bypass grafting (CABG) surgery and/or valve replacement surgery were recruited. Patients were monitored for 72 hours postoperatively in both the cardiac surgery intensive care unit (CSICU) and on the cardiac surgery ward. Using the Chi-square test, the incidences of our outcome measures were compared amongst patients after they were stratified into various levels of postoperative fluid balance.

RESULTS: One hundred and eleven consecutive patients were included in the analysis. Fluid balance was categorized into 4 groups: <0L, 0-1L, 1-2L and >2L. About 58% of patients with greater than 2L fluid gain developed AKI; this percentage was significantly higher than patients with a fluid balance less than 2L (p-value=0.019). Fluid balance was also significantly associated with a longer length of stay in CSICU and the hospital; those with greater than a 2L fluid balance were found to have the longest length of stay (both p-values <0.01).

CONCLUSIONS: Volume overload, as defined in our study as a postoperative fluid balance greater than 2 liters, was associated with a significantly greater incidence of AKI and longer CSICU and hospital length of stay. We suggest that the avoidance of volume overload should be emphasized in the postoperative management of cardiac surgery patients through the use of restrictive and goal-directed fluid strategies.

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NATURAL HISTORY AND OUTCOMES IN A POPULATION-BASED COHORT OF SYNCHRONOUS AND METACHRONOUS COLORECTAL CANCERS

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Keywords: colorectal cancer, synchronous, metachronous, survival

**Background:** Early data suggest that synchronous and metachronous colorectal cancer (CRC) may portend a worse prognosis when compared to solitary CRC. Our study objectives were to 1) characterize the clinical features and treatment patterns of synchronous and metachronous CRC and 2) compare their survival outcomes with those of solitary CRC.

**Methods:** All patients diagnosed with either synchronous or metachronous CRC between 1999 and 2008 and referred to 1 of 5 regional cancer centers in British Columbia were reviewed. Synchronous and metachronous CRC were defined as multiple (2 or more) distinct tumours that were diagnosed within and beyond 6 months of the date of index CRC diagnosis, respectively. Patients with liver metastases at initial diagnosis were excluded. Kaplan-Meier and multivariate Cox regression analyses were used to estimate survival for synchronous and metachronous CRC, and to compare outcomes with solitary CRC.

**Results:** A total of 213 patients with 388 synchronous and 69 metachronous cases of CRC were included: median age was 70 (range 26-94), 55% were men, and 30% were ECOG 0 to 1 at index diagnosis. At initial presentation, 35% and 51% of patients who manifested with synchronous and metachronous tumours, respectively, were TNM stage III. Concurrent colorectal adenomas were found in 45% of synchronous and 33% of metachronous cases. The most prevalent symptoms experienced by patients included changes in bowel movements and abdominal pain. The majority of patients underwent a curative resection (99% of synchronous and 97% of metachronous). Adjuvant chemotherapy was used to treat 44% of both synchronous and metachronous tumours. Compared to solitary CRC, patients with synchronous and metachronous CRC had similar 3-year relapse-free survival (66 vs. 66 vs. 56%, p=0.20), 5-year cancer-specific survival (69 vs. 67 vs. 53%, p=0.34), and 5-year overall survival (62 vs. 59 vs. 49%), p=0.74. Similar observations persisted in the multivariate Cox regression model.

**Conclusions:** There appears to be no differences in survival outcomes in patients with solitary, synchronous, or metachronous CRC. Patients who present with multiple CRC tumours should be managed similarly to those who only present with an isolated tumour.

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DEVELOPMENT OF AUGMENTED REALITY ULTRASOUND NAVIGATION SYSTEM FOR THE DA VINCI SURGICAL SYSTEM.

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Keywords: surgery, ultrasound, cancer, augmented reality, computer vision

Prostate cancer is the most commonly diagnosed cancer in Canadian men and 4000 men died from it in 2012. The standard of care for prostate cancer surgery is laparoscopic radical prostatectomy or robotic-assisted laparoscopic radical prostatectomy. The Intuitive Surgical’s da Vinci surgical system is the only commercially available surgical robot and it accounts for 85% of laparoscopic radical prostatectomies in the USA. Laparoscopic surgeons of all kinds, including robot-assisted, have poor intra-operative medical imaging at their disposal. In surgeries such as extracapsular radical prostatectomies and partial nephrectomies surgeons often cannot see the tumor which increases the risk of positive margins and surgical complications. To address this problem we propose an augmented reality ultrasound navigation system (ARUNS) which integrates ultrasound imaging and endoscopic video by displaying the ultrasound image directly onto the surgeon’s field of view. There are two requirements for accurate display of ultrasound images onto the surgeon’s field of view: 1) Ultrasound calibration must be performed to calculate the transformation matrix which translates the two dimensional ultrasound image pixels into a 3D coordinate system. 2) The ultrasound probe location in the surgeon’s field of view must be determined.

The da Vinci robot provides (3-D) stereoscopic vision to the surgeon via a small baseline stereo endoscope that has two cameras that are 0.5cm apart. We used the da Vinci stereo endoscope to do ultrasound calibration and ultrasound probe position tracking and found an ultrasound display accuracy of 19.2mm. We believe that we are the first to use the da Vinci stereo endoscope for ultrasound calibration. We have also proposed and implemented a novel approach for accurate ultrasound display in which we used a large baseline stereo camera with two cameras that are 12.5cm apart for the ultrasound calibration and we used the da Vinci stereo endoscope to track the ultrasound probe. Using this novel approach we found an ultrasound display accuracy of 20.7mm. We expect that with further refinement our novel approach will yield further ultrasound display accuracy gains. Accurate ultrasound display technology is important for improving Augmented Reality Ultrasound Navigation Systems that can be used for robot-assisted laparoscopic surgeries.

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CLINICAL OUTCOMES OF INDOCYANINE GREEN-ASSISTED PEELING OF THE INTERNAL LIMITING MEMBRANE DURING MODIFIED VITRECTOMY SURGERY FOR MACULAR HOLE AND EPIRETINAL MEMBRANE

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Keywords: ophthalmology, retinology, vitrectomy, ICG

INTRODUCTION: Surgery to remove the internal limiting membrane (ILM) of the retina by vitrectomy has been shown to improve visual acuity in patients with various retinal pathologies such as macular hole and epiretinal membrane. Many surgeons prefer to use selective staining methods to help visualize the transparent ILM, most commonly with indocyanine green (ICG). However, there has been much debate on the safety and efficacy of this dye, with a growing body of literature reporting adverse clinical outcomes for patients despite improved anatomical results. Novel post-operative visual field defects (VFD) are among the most commonly-cited adverse outcomes, with incidence reports ranging between <1% to 50% depending on the study.

PURPOSE: To elucidate the clinical outcomes and incidence of novel post-operative VFDs in patients treated for MH and EM with a modified staining and vitrectomy technique.

METHODS: This ongoing prospective trial included patients (n=35) with macular hole or epiretinal membrane in need of ICG-assisted vitrectomy, using a modified staining and surgical technique. The study excluded patients with potentially-confounding concurrent ophthalmic conditions, as well as those with incidental peri-operative findings necessitating surgical intervention deviating from the vitrectomy procedure. Measured pre- and post-operative clinical outcomes included visual field testing, best-corrected visual acuity, intraocular pressure, ocular coherence topography and retinal appearance on ocular fundus photographs.

RESULTS: Our statistical analysis will determine any differences between pre- and post-operative clinical outcomes, with particular attention to novel VFDs.

IMPLICATIONS: This study will contribute to the body of research examining the safety and efficacy of ICG-assisted vitrectomy, as well as investigate the impact of a modified surgical technique on clinical endpoints and adverse outcomes.

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PERIOPERATIVE OUTCOMES OF PRIMARY RENAL TUMOR RESECTIONS: COMPARISON OF IN-HOURS TO OUT-OF-HOURS SURGERY

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Keywords: surgery, Out-of-Hours, Perioperative Outcomes

Purpose of Study: Primary resection is typically performed for children with localized suspected Wilms’ tumors. Surgical access limitations may necessitate performing these operations nights and weekends. We hypothesize that outcomes will be worse in patients having nephrectomies out of hours (OOH) compared to those in standard hours (IH).

Methods Used: With IRB ethics approval, primary renal tumor resections performed on oncology patients between 2000-2011 were reviewed retrospectively. IH operations were defined as Monday-Friday 0745-1530. Outcomes included major intraoperative complications, capsule rupture, blood loss and operating time. Data were analyzed using Fischer Exact and Mann-Whitney U tests.

Summary of Results: There were 64 patients with renal tumors who underwent primary resection. Forty five procedures were performed IH, 19 OOH. Groups were similar in age, ASA status, tumor size and grade. IH compared to OOH major intraoperative complications, capsule rupture, mean blood loss and mean operating times were 2% vs 26% (p=0.007), 27% vs 42% (p=0.12), 178 ml vs. 244 ml (p=0.15) and 148 minutes for both groups respectively. There was one perioperative mortality (OOH).

Conclusions: Primary renal tumor resections performed OOH were associated with an increase in major complications compared to those performed in standard hours. Avoidance of OOH operating may reduce morbidity for children undergoing primary renal tumor resections.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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GENETICALLY MODIFIED SKIN CELL THERAPY PREVENTS DEVELOPMENT OF ALOPECIA AREATA

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Keywords: Alopecia areata, skin cell therapy

Alopecia areata is an autoimmune skin disease affecting millions of men, women, and children worldwide. It manifests as a spontaneous loss of hair usually from the scalp. The natural history of alopecia areata is unpredictable and contributes to the devastating nature of the condition and the serious impact it can have on the quality of life of the patients it affects. No cure exists for this disease and the various treatments currently used to manage it are only minimally effective, leaving patients with a very limited number of options.

Our research group, however, has come up with a genetically modified skin cell therapy that does prevent alopecia areata and could be the first therapy of its kind. Although the exact etiology and pathogenesis of alopecia areata are not well understood, the histopathological finding of peri- and intra-follicular infiltration of CD4+ and CD8+ lymphocytes, respectively, targeting anagen stage follicles of alopecia areata suggest this to be the potential mechanism involved in the damage of hair follicles. Our novel therapy targets these CD4+ and CD8+ lymphocytes and has been shown to prevent the progression of alopecia areata in C3H/HeJ mice.

A small circular piece of skin from alopecia areata affected mice is transplanted on the back of unaffected C3H/HeJ mice and monitored for graft uptake. Then, injections of our genetically modified skin cell therapy are given and the mice are assessed for clinical signs of hair loss.

Our preliminary results revealed that none of the C3H/HeJ mice (n=3) treated with our genetically modified skin cell therapy developed alopecia areata as compared to 80% of control animals that developed severe alopecia areata within 8-16 weeks after transplantation of an affected skin. These results are extremely promising and with a grant from the National Alopecia Areata Foundation, we look to conduct further studies on the use of our novel therapy and hope that it can be the answer in helping cure the millions of people affected by this traumatizing condition.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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MAGNESIUM SULPHATE FOR THE MANAGEMENT OF PRE-ECLAMPSIA AND ECLAMPSIA: A SYSTEMATIC REVIEW OF TESTED DOSING REGIMENS

Presenting Author(s): Rebecca Gordon *

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Keywords: pre-eclampsia, eclampsia, magnesium sulphate, anticonvulsants, LMIC

Introduction. Magnesium sulphate (MgSO₄) is regarded as the most effective prophylactic and therapeutic agent for eclampsia. Although well studied and widely used in high income countries (HICs), MgSO₄ is underutilized in low and middle income countries (LMICs) due to many factors.

Objective. To systematically review the dosing and effectiveness of MgSO₄ regimens administered in LMICs to women with pre-eclampsia or eclampsia.

Methods. We searched Medline, EMBASE, IPA, CINAHL, CDSR and CENTRAL databases for English language randomized controlled trials (RCT) and observational studies of MgSO₄ regimens administered in LMICs to women with pre-eclampsia or eclampsia. Two authors independently reviewed search results and extracted relevant data from eligible studies. No quality assessment was performed.

Results. Twenty seven studies (10 RCT and 17 observational studies) from 12 LMICs met our inclusion criteria, of which 26 were conducted in hospital settings. Three studied MgSO₄ for eclampsia prevention, 15 for eclampsia treatment and 9 studied MgSO₄ for both. In 22 studies, both loading and maintenance MgSO₄ dosing was administered, with intravenous (IV) or combined IV and intramuscular (IM) loading doses of 4-15g and IV or IM maintenance doses up to 2g/hr. All studies were effective at preventing the initiation and/or recurrence of eclamptic seizures. One study (N=265) found that MgSO₄ loading dose administration to women with eclampsia in the community before referral to hospital was more effective at decreasing recurrent seizures of eclampsia compared with the standard practice of administration in hospital [RR of 0.23, 95% CI 0.11, 0.49]. The four studies (N=396) of 4g IV plus 10g IM loading dose-only regimens did not show a significant reduction in eclamptic seizures compared with identical loading dose plus 5g/4hr IM maintenance dose regimens [RR of 1.64, 95% CI of 0.48,5.65].

Conclusion: This review illustrates that, although MgSO₄ has been proven to be the most effective drug for the prevention and management of eclampsia, there is variability in dosing regimens. Future research is needed to determine the most effective dosing regimen for the management of pre-eclampsia and eclampsia in LMICs.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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THE INCIDENCE OF CLINICALLY SIGNIFICANT BIPHASIC REACTIONS IN EMERGENCY DEPARTMENT PATIENTS AND THE EFFECTIVENESS OF CORTICOSTEROIDS AS PROPHYLAXIS

Presenting Author(s): Jennifer Li, Tae Won Yi

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Keywords: biphasic reaction, corticosteroids, prophylaxis

Introduction: Biphasic reactions are a feared complication of allergic reactions by emergency physicians. The incident of subsequent anaphylaxis in the pattern of a biphasic reaction is unknown. Despite a lack of evidence, corticosteroids are commonly used to prevent biphasic reactions. We sought to determine the incidence of clinically significant biphasic reactions (CSBR’s) and the benefit of corticosteroids as prophylaxis.

Methods: All consecutive adult patient encounters with an emergency department (ED) discharge diagnosis consistent with allergic reaction were retrospectively identified from two urban teaching hospitals between April 2007 and January 2012. Encounters were classified as “anaphylactic” (as defined by NIAID/FAAN) or otherwise as “allergic reaction”. Subsequent ED visits to any of the six ED's in the region within a seven-day period were identified. A comprehensive chart review was conducted and data collected on each index and all subsequent visits. CSBR’s, defined as recurrent signs and/or symptoms satisfying the definition of anaphylaxis, were identified.

Results: 2995 index encounters were reviewed to yield 486 anaphylactic and 2287 allergic reactions. There were 307 subsequent visits. Epinephrine and antihistamines were used in 23% and 83% patients respectively. Corticosteroids were used in the ED in 44% and prescribed at discharge in 31%. Six CSBR’s were identified (0.22%; 95% CI = 0.1%-0.47%). When analyzing the "anaphylactic" and "allergic reaction" groups separately, CSBR’s occurred in three (0.62%; 95% CI = 0.21%-1.8%) and three (0.14%; 95% CI = 0.04% - 0.38%) patients respectively. Five patients with CSBR’s were treated with corticosteroids in the ED and three post-discharge. CSBR’s occurred 16 minutes to 6 days after initial ED presentation, with 67% post-ED discharge. There were no fatalities (95% CI = 0% - 0.014%).

Conclusion: CSBR’s are extremely rare. There was no benefit seen with the use of steroid administration. Prolonged ED monitoring appears to yield little benefit in this patient population.

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GETTING TO THE BOTTOM OF THINGS: QUALITY OF ONLINE RESOURCES FOR COLORECTAL CANCER PATIENTS

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Keywords: website, quality, colorectal cancer

Objective: While a majority of colorectal cancer patients use the internet as an information resource, a lack of quality control for web-based resources presents a problem for physicians and patients. This study aims to comprehensively evaluate the quality of online colorectal cancer patient resources.

Methods: A previously validated website evaluation tool was used to analyze the quality of online colorectal cancer resources for patients. The term “colon cancer” was used to retrieve hits from the search engine Google and the meta-search engines Dogpile and Yippy. A “top 100” website list was compiled using pre-specified inclusion and exclusion criteria. Websites were evaluated regarding administration, accountability, authorship, organization, readability, content accuracy. Inter-rater reliability was confirmed via kappa statistics and results were analyzed via descriptive statistics.

Results: The term “colon cancer” returned over 750 websites from the search engines. Of the top 100 sites, 93% disclosed ownership, sponsorship, and advertising. Only 17% identified an author and fewer (16%) gave the author’s credentials. 67% cited resources but most information was out of date, with only 33% having updated material within two years. The average grade level of the websites was grade 10. Most sites accurately described symptoms (90%), but few provided accurate stage-specific prognosis (16%) or treatment (26%) information. Prevention methods were accurately represented in 59% of sites. The term “colorectal cancer” produced a top 100 list that differed significantly in content from the “colon cancer” list, despite the common interchanging of these terms.

Conclusions: As the third most common cancer, it is essential to provide colorectal cancer patients with appropriate and accurate resources to aid in decision-making. While many sites disclose ownership and provide accurate screening information, there are significant deficits. Of concern, many colorectal cancer sites lack authorship, are out of date, are written at a high grade level and lack accurate stage-specific prognostic and treatment information. This study may help to inform the patient-physician encounter and allow physicians to provide patients with tools to evaluate the quality of web-based colorectal resources.

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SIGNIFICANCE OF STRESS GRANULES IN THE COXSAKIEVIRUS TYPE B3 INFECTION

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Keywords: stress granules, coxsackievirus, G3BP1, viral replication

Background: Coxsackievirus type B3 (CVB3) is a non-enveloped enterovirus, consisting of a single-stranded, positive-sense RNA genome. CVB3 infection causes myocarditis, an inflammatory disease of the myocardium, and its sequelae, dilated cardiomyopathy. Stress granules (SGs) are cytosolic aggregates consisting of messenger ribonucleoproteins such as Ras-GAP SH3 domain-binding protein (G3BP1) and target mRNAs. SGs were implicated to play an important role in mRNA storage and metabolism during stress conditions such as viral infection and cancer. Previous studies showed transiently induced SGs and G3BP1 cleavage at amino acid Q325 during viral infection. In this study, we investigated the significance of SGs during CVB3 infection by overexpressing G3BP1, G3BP1N-term, G3BP1-C-term and mutant G3BP1 (G3BP1Q325E) and by knocking down G3BP1. Elucidating the roles of SGs may lead to the development of novel treatments for CVB3-induced diseases.

Methods: HeLa cells were transfected with either pEGFP-G3BP1, FLAG-G3BP1, FLAG-G3BP1-N-term, FLAG-G3BP1-C-term, or siRNA for G3BP1 mRNA transcript, followed by CVB3 infection. Viral replication and antiviral protein levels were measured by western blot analysis, qRT-PCR or plaque assay. Confocal imaging of HeLa cells overexpressing GFP-G3BP1 or GFP-G3BP1Q325E were used for monitoring the SGs formation.

Result: Confocal imaging demonstrated that G3BP1-SGs induced cytoplasmic punctate formation at ~3 hrs P.I. and disappearance at ~5 hrs P.I. whereas G3BP1Q325E restored G3BP1-SG formation ~5 hrs P.I. Furthermore, G3BP1-SGs colocalize with poly-A-mRNA only at 3 hrs P.I. Western blot analysis, qRT-PCR, and plaque assay data showed that overexpression of GFP-G3BP1 significantly decreased the expression of VP1, whereas G3BP1 knockdown by siRNA significantly increased the expression of VP1. Furthermore, G3BP1-C-term fragment reduces SG formation during CVB3 infection. Elevated antiviral protein levels of PKR and p-eIF2α in HeLa cells overexpressing G3BP1 and G3BP1Q325E suggest a potential immune response from stress granules.

Conclusion: Our data suggest a protective mechanism of G3BP1-SGs during CVB3 infection where overexpression of G3BP1 limits CVB3 replication, but knockdown of G3BP1 promotes CVB3 replication. Furthermore, GFP-G3BP1Q325E rescues SG formation at late stages of CVB3 infection. N-terminal and C-terminal cleavage fragments will be further studied to elucidate the roles of these fragments in regards to CVB3 replication.

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A PILOT STUDY TO IMPROVE IMMUNOSUPPRESSANT MEDICATION ADHERENCE IN ADULT KIDNEY TRANSPLANT RECIPIENTS

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Keywords: transplantation, renal failure, technology, study design

Rationale: Kidney transplant recipients must take immunosuppressant medications regularly (usually twice daily) to avoid rejection of the transplanted kidney. Non-adherence with immunosuppressant medications is a common problem (estimated prevalence 22.6 cases / 100 patient years), causing 50% of late rejection episodes after the first post transplant year, and is estimated to be the cause of approximately 15% of all kidney transplant failures. Importantly, even minor deviations in immunosuppressant drug dosing may lead to rejection (i.e. taking < 95% of medications as prescribed).

Hypothesis: Recent advances in immunosuppressant medications have allowed for once daily immunosuppressant dosing, once daily dosing along with novel behavioral modification strategies may help improve adherence but have not been systematically testing in the kidney transplant setting.

Methods: A literature search was performed to identify medication adherence programs that currently existed and their effectiveness. Then several mobile app developers were contacted to determine the cost and logistics of implementing their program.

Results: Based on our research, we propose a pilot study of n = 50 kidney transplant recipients at least 3 years post transplantation to determine the impact of switching patients to a once daily immunosuppressant medication regimen and a mobile phone medication tracking application on adherence. Adherence will be measured by a novel strategies including a patient survey instrument as well as a novel surrogate biochemical test (i.e. variability in drug levels).

Conclusions: We will review the protocol for the proposed pilot study that includes both novels strategies and novel methods of adherence measurement that will be applied for the first time in a controlled study in kidney transplantation. The pilot results will inform the design of a definitive Canadian multi-center study.

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IMPROVING WALKING SYMMETRY IN PEOPLE WITH STROKE

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Keywords: stroke, rehabilitation, walking

Effective rehabilitation strategies are critical in promoting neuroplasticity and neural adaptations for people who have suffered neurological injury. There are over 300,000 Canadians living with the effects of stroke. A stroke damages one side of the brain, resulting in motor impairments to the other half of the body. This leads to asymmetrical walking; the weaker leg is used less in propelling and supporting the body compared to the stronger leg. Improving symmetry is important because asymmetrical walking leads to impaired balance, decreased bone strength, and increased falls. However, little research has looked at improving walking symmetry. This study tests whether applying resistance against the stronger leg can improve walking symmetry in people with stroke. To increase the use of the weaker leg, we make the stronger leg harder to use. Six participants were fitted into the Lokomat, a gait therapy device with a treadmill, harness, and leg-cuffs. The Lokomat was programmed to apply resistance, equivalent to 10% of the hip and knee flexors’ maximal voluntary contraction, against the stronger leg. Force-sensitive resistors and motion capture cameras were used to respectively measure single-support stance time and stride length, in order to determine the use of each leg during walking. Subjects walked consecutively for 50 strides with no resistance, 50 strides with resistance against the stronger leg, and 50 strides with resistance removed. We found that applying resistance against the stronger leg can improve walking symmetry and increase the use of the weaker leg to propel and support the body during walking. The study demonstrated the feasibility of this intervention and uncovered aspects of the design to be improved upon.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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UNDER THE MASK: THE IMPACT OF POSITION VERIFICATION SYSTEMS ON PATIENT-REPORTED ANXIETY AND QUALITY OF LIFE OUTCOMES IN HEAD AND NECK CANCER RADIOThERAPY

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Keywords: anxiety, quality of life, position verification, radiotherapy, head and neck cancer

Introduction: In addition to rigid thermoplastic immobilization systems, accurate patient position verification is an integral part of radiotherapy for Head and Neck Cancer. Cone-Beam Computer Tomography position verification (CBCT-3D) has been quickly adopted at radiation centres across the world and is available for use at the BC Cancer Agency. However, the impact of longer image acquisition times required for CBCT-3D compared to standard X-Ray Electronic Portal Imaging position verification (EPI-2D) on patient-reported anxiety and quality of life outcomes has not been addressed and will be explored in this prospective randomized controlled trial.

Method: 20 adults with Head and Neck Cancer were randomized to EPI-2D (n=10) or to CBCT-3D (n=10). For both groups, position verification occurred on day 1, 2, 3, and week 3, 5 of Volume-Modulated Arc Radiotherapy. The state portion of the State-Trait Anxiety Inventory and the time the patient spent on the treatment couch were collected on these days. EORTC QLQ-HN35 (HN35) quality of life questionnaires were completed prior to and at completion of the entire course of radiotherapy.

Result: Neither state anxiety nor change in state anxiety differed between the groups. As well, state anxiety did not correlate with the time patient spent on the treatment couch. Mann-Whitney’s U test found that the change in the individual HN35 quality of life scales did not differ significantly between groups. However, after combining the scales with O’Brien’s Global Statistics method, the EPI-2D group’s quality of life deteriorated more than that of the CBCT-3D group (U(10,10)=18.00, z=-2.42, p=0.015).

Discussion: The additional time required for CBCT position verification did not cause additional anxiety in patients undergoing radiotherapy for Head and Neck Cancer. Globally, patient-reported quality of life may deteriorate less with CBCT than with EPI as the more accurate position verification made possible with CBCT may better spare Organs-at-Risk. However, larger studies would be needed to confirm these findings.

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REVIEW OF COMPLICATIONS AFTER ELECTIVE CRANIOTOMY: DOES MY PATIENT NEED TO GO TO THE INTENSIVE CARE UNIT?

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Keywords: craniotomy, intensive care, complications, outcome

Introduction: Patients are routinely admitted to ICU after elective craniotomy. Although the factors predicting post-operative complications have been explored in adults, these factors are not fully characterized in children. The purpose of this study was to explore the nature and frequency of serious early post-operative complications requiring intensive care management.

Materials and Methods: We conducted a retrospective review of patients < 18 years old with elective cranial surgery at British Columbia’s Children’s Hospital from 2008-2011. Emergency procedures were excluded from this review. Study variables included patient demographics, clinical history, operative details, and early post-operative complications requiring intensive care management.

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

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

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UNDERUTILIZATION OF LOCAL SALVAGE THERAPY AFTER PRIMARY RADIOTHERAPY FOR PROSTATE CANCER IN BRITISH COLUMBIA

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Keywords: prostate cancer, external beam radiation therapy, brachytherapy, salvage prostatectomy, cryoablation

Background: Early biochemical detection and subsequent slow progression of recurrent prostate cancer after primary radiotherapy permit the delivery of potentially curative local salvage therapy (LST). Options for LST include cryotherapy, salvage brachytherapy (SBT), and salvage radical prostatectomy (SRP). Based on our clinical impression that few patients were receiving LST, we studied the rates at which patients are offered, and receive LST after failure of primary radiotherapy.

Methods: Patients with localized prostate cancer who received primary radiotherapy with curative intent between 1999-2000 were identified in the British Columbia Tumour Registry. Exclusion criteria included patient age > 72, PSA > 40, and cT4 at diagnosis. Data on clinicopathologic features, primary therapy, PSA kinetics, and salvage therapy were collected retrospectively. Radiation failure was defined by biochemical recurrence according to the Phoenix criteria or by initiation of salvage therapy.

Results: Out of 1782 patients treated in the study period, 1067 met inclusion criteria. Of these, 257 failed radiation. This was managed with observation (>12 months) in 127 patients and androgen deprivation therapy (ADT) in 118. Of the observed patients, 66 subsequently received ADT. Five patients (1.8%) received LST (3 SRP, 2 SBT). Seven patients were lost to follow-up. A documented discussion of LST was present in 44 (17%), unknown in 56 (22%) and absent in 157 (61%) cases. Based on clinicopathologic parameters, 24% of patients appeared eligible for SRP but were not offered it.

Conclusions: Few patients were considered for LST after radiation failure, and only 1.8% received it. This review reveals a lack of uniform monitoring and treatment strategies in this challenging patient population, and indicates a need for more collaboration between all treating physicians and tertiary care centres.

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PROTECTING TRANSPANTED ISLETS FROM ALLOGENEIC RESPONSES USING NATURALLY IMMUNE PRIVILEGED HUMAN HAIR FOLLICLE CELLS

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Keywords: diabetes, islet transplantation, immune-privilege, autoimmunity

Type 1 diabetes is one of the most common autoimmune diseases that is characterized by the destruction of insulin-synthesizing pancreatic beta islet cells by host immune system. Consequently, patients with Type 1 diabetes must depend on daily insulin injections for managing blood glucose levels. In recent years, researchers have made advances in islet allotransplantation to serve as a potential treatment, but its widespread use is challenged by the increased tumor risk and opportunistic infections from long-term usage of immunosuppressive drugs. A reduced-risk, localized immuno-modulatory therapy is urgently needed. We hypothesize that non-histocompatible islets, in close association with hair follicle cells, will escape immune-surveillance and will not be rejected. We demonstrated that cultured hair follicle derived dermal sheath cup (DSC) cells exhibit natural immune privilege due to the secretion of immuno-regulatory factors and a lack of MHC class I and II expression. In comparison to fibroblasts, a significant upregulation of immune privilege associated genes (Activin-A, TGFβ1, TGFβ2, and PDL-1) and a downregulation of MHC class I molecules (HLA-A and HLA-B) were observed by real-time polymerase chain reaction (qPCR) on cDNA samples. Enzyme-linked immunosorbent assay (ELISA) and flow cytometry were used to study allogeneic responses of co-cultured human peripheral blood mononuclear cells (PBMCs, as responders) and purified human islets (as stimulators). The secretion of interferon-gamma (IFN-γ) from PBMCs was significantly reduced in the presence of DSC cells (23.0 vs. 5.7 pg/ml, p<0.01) or DSC-conditioned medium (18.5 vs. 2.15 pg/ml, p<0.04). The function of T-effector (CD8+ IFN-γ+, 64.2% vs. 42.8%, p<0.01) and T-helper1 cells (Th1, CD4+ IFN-γ+, 29.8% vs. 20.4%, p<0.03) was inhibited by 36% and 32%, respectively, indicating a hyporesponsiveness to alloantigen stimulation. This study demonstrates that human islet/hair follicle dermal sheath cell constructs exhibit localized immunosuppressive properties, suggesting that transplanted islets may be benefited from the immune privilege status. Using naturally immune privileged cells may reduce the need for chronic systemic immunosuppression in clinical islet transplantation.

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DEFINING CRANIOSCOLIOSIS

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Keywords: craniofacial, surgery, plastic, cranioscoliosis

Purpose

To define cranioscoliosis and establish precise diagnostic criteria for characterization and communication of the diagnosis and severity.

Methods

We examined the 3D photographs of 9 patients with one or more of the following diagnoses: cranioscoliosis, hemifacial microsomia, torticollis, microtia, or hemifacial hypertrophy. After aligning each photograph to normative landmarks, we measured the locations of 9 landmarks defining ear and eye positions on each side in 3 dimensions. Concurrently, a total of ten subjects with medical backgrounds were given Fearon’s definition, our interpretation of cranioscoliosis and 3D photographs of the 9 patients in which to diagnose the condition.

Results

Preliminary data analysis shows that the tragia are the points of maximal asymmetry, in both anterior-posterior and superior-inferior directions making them the ideal landmarks for defining cranioscoliosis. The consensus for diagnosing cranioscoliosis from 3D clinical photographs appears to be a minimum of 0.5 cm difference between the tragia.

Conclusions

Our 3D analysis suggests that cranioscoliosis can be quantified by measuring the tragia and recording the difference in position in both AP and SI directions. We propose that cranioscoliosis is a sign rather than a diagnosis and may be present in many craniofacial conditions.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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DEVELOPMENT OF INTEGRATED CLINICAL SKILLS AND GROSS ANATOMY AND EMBRYOLOGY OF THE URINARY SYSTEM LEARNING MODULES

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Keywords: urinary, educational, modules, interactive, integrated

Purpose: The goal of this Summer Student Internship Program (SSIP) project is to facilitate learning of difficult urinary system concepts by adding quiz modules to the UBC MEDICOL system. These modules look to incorporate the clinical, anatomical/embryological and basic physiology of the urinary system into realistic clinical cases.

Methods: Microsoft PowerPoint and the Articulate program were utilized to create slide based virtual patient modules, following a logical progression from patient contact, to medical testing, treatment and eventual resolution. Throughout these modules, multiple choice questions were incorporated using Microsoft PowerPoint. Furthermore, the Articulate program allowed for the implementation of videos and interactive labeled graphics of the urinary system anatomy/embryology and clinical skills.

Content within the modules were obtained from the Fluids, Electrolytes, Renal, Genital and Urinary (FERGU) clinical skills and lecture notes, while any additional information were found from Access Medicine or Medscape reference. Videos were streamed from the original source, while all images incorporated were available for public use.

Results: This project will be evaluated via a survey that will be completed at the end of each module. The survey results will be examined to determine if the students believed the modules were effective learning tools for urinary system clinical skills and anatomy/embryology, as well as to determine if there is interest in the development of similar modules for other Foundations of Medicine (FMED) blocks. Results may be obtained after the completion of the FERGU block, in late May or June 2013.

Conclusions: With the vast amount of information that medical students must learn regarding the urinary system, innovative educational tools can be a powerful means to achieve this goal. Through the use of interactive virtual patient modules, students have the ability to follow a patient case in a realistic clinical setting. This project looks to reinforce the clinical, anatomical/embryological and physiological knowledge of medical students, through quizzes and interactive media. If results are positive, we hope to extend the development of these learning modules to other UBC Medicine FMED blocks.

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PATIENT SAFETY: ASSESSMENT OF RETAINED NEUROPATTIES ON PORTABLE X-RAY RADIOGRAPHS

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Keywords: neurosurgery, radiology, surgical sponges, patient safety

Purpose of Study: Unintentionally retained foreign bodies are preventable complications that occur in all surgical disciplines. Any object placed inside a surgical wound may become a retained foreign body. The incidence of retained foreign bodies is estimated at 1 per 8,000 to 18,670 operations. Surgical sponges represent 69% of reported retained foreign bodies.

Surgical sponge counts by perioperative nurses help to identify potential retained surgical sponges. In accordance with national guidelines, BC Children’s Hospital protocol requires intra-operative radiographs to be obtained when surgical sponge counts cannot be reconciled.

Neurosurgeons routinely use specialized surgical sponges, neuropatties, which measure as small as 6mm x 6mm. An “x-ray detectable” marker is embedded in each neuropatty. However, current industry standards for testing the radio-opacity of surgical sponges do not reflect the challenges and limitations of the operating room.

Methods: We assessed the radiographic detectability of four standard neuropatty sizes in a cadaver model. The cadaver was dissected and neuropatties were implanted in regions relevant to neurosurgery. Radiographs were obtained with a portable x-ray machine and computed radiography equipment identical to those used in the operating rooms. Anterior-posterior and lateral projection radiographs were collected with randomized placement of neuropatties in the anterior cranial fossa, posterior cranial fossa, and extradural space of the thoracic and lumbar spine. A blinded cohort of pediatric neurosurgeons and radiologists was asked to identify any neuropatties seen on the radiographs.

Results: Preliminary analysis suggests that clinicians performed consistently when identifying neuropatties on the radiographs. The simulated intra-operative radiographs were approximately 55% sensitive for detecting 13mm x 13mm neuropatties and 34% sensitive for 6mm x 6mm neuropatties.

Conclusions: Radio-opaque markers on neuropatty products measuring 13mm x 13mm or less cannot be satisfactorily detected under simulated clinical conditions. Inadequate detectability of surgical sponges is a concern for patient safety as retained surgical sponges have the potential to cause significant morbidity and mortality.

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MEASUREMENT OF MOUTH OPENING IN A CANADIAN PEDIATRIC POPULATION

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Keywords: interincisal, opening, temporomandibular, joint, measurement

Purpose: The goal of this study was to define the interincisal opening (IIO) in a Canadian pediatric population.

Methods: IIO was measured between the edges of the upper and lower right central incisors with the mouth maximally open in 926 eligible children between the ages of 1-18 at BC Children's Hospital. Individuals with current or previous TMJ disease were excluded from the study.

Results: The mean and standard deviation of IIO for each age group of males and females, rounded down to the year, was calculated. The mean IIO at the adult end of our study was 52.8 mm and 49.4 mm for males and females, respectively. A scatter plot was created using the mean and two standard deviations representing the upper and lower limits of normal. The data fit a second order polynomial regression curve. The coefficient of determination for the lower limit of normal is 0.86 and 0.89 for males and females, respectively.

Conclusions: IIO increases with increasing age, and seems to plateau at about age 12. The mean IIO at the adult end of our test is 51 mm, similar to the literature value of 50.77 mm for adults. We hope the normal IIO of a pediatric population determined in this study will aid in the objective diagnosis of TMJ pathology and identify patients who might have a difficult airway should they need to be intubated for general anaesthesia.

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VIRTUAL PATIENTS IN RESUSCITATION (VIPIR): THE USE OF VIRTUAL PATIENTS FOR MEDICAL STUDENTS’ EDUCATION IN TRAUMA RESUSCITATION

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Keywords: medical education, trauma, resuscitation, virtual patients

BACKGROUND: Medical students are required to develop a wide range of “medical expert” competencies prior to graduation. Active learning is critical, however some of the most urgent and life-threatening clinical scenarios are encountered infrequently during students’ clinical training. Even when life-threatening situations present, students rarely have the opportunity to be actively involved in, and take responsibility for, decision-making in resuscitations.

Virtual Patients (ViPs), in the form of interactive computer-based clinical scenarios, represent one mode of Stimulation-based Medical Education (SBME). SBME is a rapidly growing component of medical training, giving students the opportunity for task training in complex clinical scenarios in a safe and “mistake-forgiving” environment, where they can learn from their errors. The ethical concerns of traditional bedside teaching are circumvented, posing no risk to patients. These benefits of SBME are particularly relevant for training of medical students in the appropriate management of trauma patients, where high-risk situations often prevent students from taking an active role in management.

A critical review of the literature on the use of ViPs in medical education was undertaken. It was found that the most unique function of ViP’s is to facilitate the development of clinical reasoning in an era where increased training expectations and limited training resources have a great impact on medical education.

METHODS: 2 Trauma ViPs were developed to address the University of British Columbia Faculty of Medicine’s Year 3 Emergency Medicine Clerkship objectives. The Clerkship Core Content Manual and ATLS guidelines were used as primary resources to design the storyboards. Video clips of simulated trauma scenarios and pictures were incorporated into the cases to provide a more interactive experience for the student. The MedIT Instructional Design team assisted by transposing the cases’ storyboards using the Articulate software program.

RESULTS: Two ViPs were created which will be made available to medical students for self-directed learning at the medical school’s distributed sites and integrated clerkships. They will provide an opportunity for students to practice their decision-making skills in trauma resuscitation scenarios. The ViPs will also be made available for students in other health care disciplines.

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EVALUATION OF A HEALTH EDUCATION WORKSHOP IN RURAL UGANDA USING PRE AND POST-TEST RESEARCH

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Keywords: education, global health, health promotion, preventative medicine

Background:
The purpose of this study was to evaluate if a medical student designed health education curriculum could improve knowledge of sexual health and life skills in adolescents in Uganda, and to investigate if teaching could be successfully transferred to local nursing aides, so as to facilitate program sustainability.

Methods:
A quasi-experimental one-group pre- and post-test research design was used to evaluate knowledge acquisition. Data was collected from nursing aides and secondary school students. A 10-15-item questionnaire was used to evaluate knowledge acquisition. The curriculum employed lectures, decision-making activities, and group discussions. Nursing aides were taught the curriculum first, then secondary school students were taught either by the researchers or by nursing aides in an effort to investigate if the program could be sustained by local residents.

Results:
Questionnaires were obtained from 34 nursing aides and 158 secondary school students. The nursing aides’ mean score on the sexual health pre-test was 60%, and 69% on the post-test, which increased significantly (p=0.0150). Their mean score on the life skills pre-test was 42%, and 65% on the post-test, which increased significantly (p<0.0001). The secondary school students’ mean score on the sexual health pre-test was 43%, and 50% on the post-test, which increased significantly (p<0.0001). Their mean score on the life skills pre-test was 41%, and 60% on the post-test, which increased significantly (p<0.0001). There was no significant difference in test score improvement between secondary school students taught by the researchers and those taught by nursing aides.

Conclusion:
Although the mean post-test scores were low, statistical analysis showed the health education curriculum significantly improved nursing aides’ and secondary school students’ knowledge of sexual health and life skills. Future work will include investigating how the curriculum can be improved to further increase knowledge acquisition and if knowledge acquired is retained long-term. Since there was no significant difference in score improvement between students taught by the researchers and those taught by local nursing aides, the training program provided to the nursing aides was sufficient to standardize curriculum delivery, and suggests the program can be continued by them.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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DISCRIMINATION OF COMPLEX HISTONE CODE TYPE ANALYTES USING SUPRAMOLECULAR HOSTS

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Keywords: epigenetics, supramolecular chemistry, sensor arrays

Post-Translational modifications (methylation, phosphorylation, acetylation, etc.) to histone N-terminal tails are collectively called the histone code and are key epigenetic regulators of cellular function. The writer, reader and eraser enzymes that place, read and remove these marks contribute to the biological complexity of these highly dynamic systems. Currently only antibodies are used to study these modifications. Antibodies suffer limitations of batch-to-batch consistency, epitope masking, and specificity. Chemical sensors offer advantages of reproducibility and synthetic modification allows tuning of specificity. We demonstrate a series of host/dye sensors that are capable of discriminating between sequences of modified histone tail peptide sequences. These sensors give a unique multi-dimensional fingerprint of fluorescent responses that discriminate the analytes without the need for antibodies.

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NON-STEROIDAL ANTI-INFLAMMATORY DRUG USE IN THE PERIOPERATIVE CARDIAC SURGICAL CARE AT THE ROYAL COLUMBIAN HOSPITAL

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Keywords: NSAID, cardiac surgery, postoperative pain

Background
A rapid surgical recovery approach based on the Reimer-Kent Postoperative Wellness Model has been successfully used at the Royal Columbian Hospital’s (RCH) cardiac surgery program since 1996. This model subscribes that patients be rapidly returned to functional baseline by actively preventing common postoperative issues including pain. There is good evidence in this program that acute post-surgical pain prevention is achievable with around-the-clock dosing of maximal opioid-sparing non-opioids [acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs)] as background analgesia and an immediate release opioid for breakthrough pain. Given according to exclusion criteria, this approach has achieved excellent analgesia and decreased opioid related side effects. Recently though, there have been concerns raised in the literature regarding NSAID-related complications in this patient population.

Purpose
The hypothesis for this pilot study is that NSAIDs can be used according to pre-determined and explicit exclusion criteria in the postoperative pain management of cardiac surgery patients without increasing postoperative morbidity or mortality. We aim to demonstrate that retrospective chart data is retrievable and informative, in identifying perioperative complications (including renal dysfunction, length of stay, duration of intubation, re-intubation rates, delirium, stroke, postoperative bleeding, evidence of gastrointestinal dysfunction) and assess whether rates of these complications are affected by NSAID use or other predisposing perioperative factors.

Methods
A retrospective consecutive review of charts of patients having undergone primary coronary artery bypass graft procedures in 2008 at RCH was undertaken. Demographic information, clinical information and evidence of perioperative complications were recorded. Patients were divided into two groups – those who had perioperative NSAIDs and those who did not. Patients requiring valve repair, congenital heart procedures, and those not exposed to cardiopulmonary bypass were excluded.

Results
116 charts of cardiac surgery patients from 2008 were reviewed, of which 107 met the study’s inclusion criteria. Demographic data, pain medication use, potential predisposing factors, perioperative complications, and discharge factors were recorded. Data analysis using descriptive statistics is currently underway.

Conclusions
This pilot project demonstrated that chart data was retrievable. Analysis of the data will provide insight into whether NSAIDs can be safely used, as a part of balanced analgesia, in this patient population.

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THE IMPLEMENTATION AND EVALUATION OF AN ABORIGINAL HEALTH SPEAKER SERIES FOR MEDICAL STUDENTS

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Keywords: Aboriginal health, medical education

Background
Canada’s Aboriginal peoples suffer from a relative disproportionate burden of disease and lower life expectancies compared to the greater population. This reflects the effects of history, including colonization and the loss of traditional livelihoods and cultural identities, combined with the social determinants of health. Against this seemingly negative background, health care professionals can play a positive role in improving patient care. We aimed to implement and assess a speaker series where students could learn from leaders in the field and also appreciate the value of Aboriginal cultures and philosophies and the richness they bring to our society.

Methods
An initial needs assessment was conducted with members of the Aboriginal Health Initiative student group to determine issues of greatest interest. Based on the identified topics, physicians with expertise were invited to present at one of two speaker series. An open forum for discussion followed each presentation and attendees were asked to complete brief questionnaires.

Results
Four main questions were asked to the 31 responders on a 1 to 5 scale where 1 was “did not/very poor/unsatisfactory”, 2 was “somewhat/poor/somewhat unsatisfactory”, 3 was “average/satisfactory”, 4 was “above average” and 5 was “outstanding”. When asked the degree to which the speaker enhanced their understanding of the topic, the mean result was 4.5 out of 5.0. When asked for the global rating of the speakers themselves, the mean result was 4.4 out of 5.0. When asked whether the event met the attendees’ expectations for the presentation, the mean result was 4.5 out of 5.0. When asked for their overall experience for the workshop, the mean result was 4.3 out of 5.0.

Conclusions
Based on numerical data, the workshop scored an “above average” to “outstanding” on the 4 questions posed indicating that it enhanced understanding, that the speakers were well received, that it met expectations and that there it was a positive overall experience. Moreover, written feedback showed that attendees most valued when speakers shared personal experiences of working in Aboriginal health and insight into the misunderstandings between Aboriginal people and non-Aboriginal physicians. Attendees voiced that they would appreciate more tips on developing relations.

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CHOLESTERYL ESTER STORAGE DISEASE AS AN UNRECOGNIZED CAUSE OF LOW HDL-CHOLESTEROL IN A COHORT OF DYSLIPIDEMIC PATIENTS

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Keywords: dyslipidemia, coronary artery disease, cholesteryl ester storage disease

Background: The adverse effects of reduced high-density lipoprotein (HDL) levels and increased low-density lipoprotein (LDL) levels on the incidence of coronary artery disease (CAD) have been well established since the 1970s. Our study aims to identify the prevalence of cholesteryl ester storage disease (CESD), an autosomal recessive disorder of lysosomal acid lipase (LAL) deficiency that can cause extremely low HDL levels and high LDL levels, in a cohort of patients from the Healthy Heart Program Prevention Clinic at St. Paul’s Hospital. The most common clinical features of this disease include dyslipidemia, hepatosplenomegaly, elevated liver enzymes such as alanine aminotransferase (ALT), and premature CAD. The prevalence of CESD is estimated to be 1/40,000 to 1/300,000; however, it is thought to be underestimated due to an exceptionally variable disease manifestation and low awareness of the condition.

Hypothesis: CESD is a more frequent cause of low HDL with high LDL than currently recognized in patients with this combined form of dyslipidemia.

Methods: A database of laboratory values for patients in the Healthy Heart Program Prevention Clinic from 1995-2012 (N=7,357) was analyzed in order to identify patients with consistently low HDL levels (<1 mmol/L) and high LDL levels (>4 and <8 mmol/L) with or without elevation of ALT. A retrospective chart review was then conducted in order to gather their medical history, family history, and physical exam findings. In the next phase of the study, patients will be invited to donate a blood sample that will be tested for CESD by both an LAL enzyme assay, and, if low, DNA sequencing to assess for mutations affecting LAL.

Results: The database analysis revealed 281 patients with consistently low HDL levels and high LDL levels. Of these patients, 101 had high ALT, 142 had normal ALT, and 38 did not have ALT values available.

Conclusion: The retrospective chart review suggests a promising number of potential subjects for this study. Identification of CESD patients in this cohort would increase the awareness of CESD as a cause of low HDL with high LDL, and allow these patients to obtain potential treatment for LAL deficiency.

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THE DELIVERY OF HEALTH PROMOTION MESSAGES TO YOUTHS: FACTORS TO CONSIDER

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Keywords: health promotion, youth, physical activity

BACKGROUND

In March of 2005, the British Columbia Ministry of Health launched ActNow BC, an initiative to improve the health of British Columbians through a multi-faceted, integrated approach. The proposed action plan involved the participation of government and non-government organizations, communities, schools, and the private sector. In 2011, ActNow BC was relaunched as Healthy Families BC, a health promotions program that aims to target a diverse range of populations within British Columbia, including but not limited to youth, families, immigrants, pregnant women, the physically challenged, Aboriginals, athletes, employers, senior citizens, and university students.

A partnership was formed between The British Columbia Ministry of Health and the University of British Columbia Faculty of Medicine in the form of a Community Learning Service Option (CLSO) within the Doctor Patient and Society (DPAS) course. The purpose of this partnership was two-fold. First, to provide future physicians with an insight into the world of health promotion medicine, and secondly to provide useful feedback to the British Columbia Ministry of Health in regards to their health promotion methods, specifically within the area of physical activity in youth.

METHODS

A literature review was conducted on current approaches and methodologies utilized in the practice of health promotion, to highlight those that have demonstrated considerable success through measurable outcomes. The specific parameters considered were content, delivery method, location and social context, and delivery source.

Second year medical students attended a series of diverse health promotion events, under the role of Community Ambassadors for Healthy Families BC. A qualitative post-event report was created after each event, which included case studies of attendees.

RESULTS

A guide for incoming Community Ambassadors for Healthy Families BC was created. The target audience is volunteers who are engaged in promoting physical activity in the youth population. Its purpose is both to generate thoughts and considerations as well as to give guidance for those seeking to create an effective plan for health promotion in this sub-population.

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DEPOLARIZATION RATIO DISTRIBUTION AS A POTENTIAL TOOL FOR SKIN LESION SEPARATION

Presenting Author(s): Warren Shenkenfelder

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Keywords: skin cancer, polarized lasers

We have been investigating the use of light polarization to distinguish skin lesions. When polarized laser light interacts with skin, polarization reduces. Depolarization is caused by the internal scattering within the semi-opaque skin, and the process is governed by the skin’s optical properties. Depolarization can be quantified by the depolarization ratio \( D = (I_{\text{horizontal}} - I_{\text{vertical}}) / (I_{\text{horizontal}} + I_{\text{vertical}}) \), where \( I_{\text{horizontal}} \) and \( I_{\text{vertical}} \) are the scattered intensity measured through a polarizer oriented in the horizontal and vertical directions in respect to the polarization of the incident illumination. In previous studies, it was demonstrated that depolarization ratio generated from the stationary region of the illuminated field could separate malignant from benign lesions. In this pilot study, we investigated the feasibility of performing skin lesion differentiation by analyzing the distribution of depolarization ratio collected radially from the centre of the lesion to the entire illuminated field.

We tested our method in-vivo on a set of skin lesions including seborrheic keratosis, nevus, and normal skin. The experimental set-up consists of a laser that emits a narrow beam of horizontally polarized light, a polar filter that can be rotated 90 degrees, and a camera. The laser is reflected off the skin and a radially-symmetrical speckle pattern is then captured by the camera twice while the polarizer axis is rotated from horizontal to vertical. During the imaging period, the two images were registered perfectly. These two images are used to compute a set of depolarization ratios selected radially from the image centre to the end of the illuminated field.

This new method showed a clear separation in the depolarization ratio distribution among the tested lesions. Thus we expect that radial depolarization distributions provide more data for lesion separation then depolarization ratio alone.

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MINDFULNESS-BASED COGNITIVE THERAPY FOR PROVOKED VESTIBULODYNIA: WOMEN'S FEEDBACK AND TREATMENT EXPERIENCES

Presenting Author(s): Pretty Verma *

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Keywords: vestibulodynia, mindfulness, cognitive based therapy

Rationale/Background: Provoked Vestibulodynia (PVD) involves severe pain in the vulvar vestibule and is most commonly experienced with sexual intercourse; it is highly distressing and detrimental to women’s sexual functioning, self-image, and psychological health. In order to manage PVD pain and distress, initial evidence suggests that psychological approaches are promising. One such approach, mindfulness-based cognitive therapy (MBCT), has been increasingly applied to manage various chronic pain conditions, yet has only recently been tested for PVD (Brotto et al., in press). The purpose of this presentation is to share women’s feedback and treatment experiences after participation in a group MBCT for PVD.

Methods: 87 women with PVD participated in four, bi-weekly group sessions of MBCT. They completed feedback forms after the fourth session. The form, returned by 32 women, consisted of rating scales (completed by a subset of women) from 0 (not at all) to 5 (very) to assess how beneficial the group sessions were and the degree to which participants completed their homework assignments; it also included a mixture of closed and open-ended questions. The open-ended responses were independently coded by two authors.

Results: Various aspects of the MBCT sessions were deemed beneficial, including the sense of community women felt being part of the group and the education provided (M benefit rating = 3.6). While the majority of women (84%) felt that offering sessions more or less frequently would not have enhanced the effectiveness of the group, most (75%) wanted more than 4 sessions (M number of sessions requested = 6.6). While women reported a moderate degree of homework completion (M rating = 3.2), they also noted several factors that would have made compliance easier (e.g., more time in their schedules). Finally, women reported a number of topics for consideration in future groups.

Conclusions: Women with PVD perceived benefit from various components of a 4-session MBCT. As well, women identified some aspects that, if altered, could enhance the effectiveness of the program. These results can be used by clinicians and researchers who aim to develop MBCT groups in the future to target pain and sexual difficulties.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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INHIBITION OF CASTRATION RESISTANT PROSTATE CANCER BY SINTOKAMIDE—A NOVEL ANTAGONIST OF THE AMINO-TERMINUS OF THE ANDROGEN RECEPTOR

Presenting Author(s): Iran Tavakoli

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Keywords: prostate cancer, androgen receptor n-terminal domain, drug development, sintokamide

Objective: Lethal castration resistant prostate cancer (CRPC) is considered to involve a transcriptionally active androgen receptor (AR). All current therapies target AR ligand-binding domain (LBD) to inhibit receptor activity. Unfortunately these therapies fail presumably by mechanisms involving breakthrough of androgen synthesis and/or expression of constitutively active AR splice variants that lack LBD. Recent studies have provided proof-of-concept that AR N-terminus domain (NTD) is druggable with the development of EPI-001, an antagonist that has specificity and efficacy on both androgen-sensitive and CRPC xenografts. Here we reveal an unrelated class of compounds called SINT1 as a potent therapeutic agent for CRPC that targets AR NTD.

Methods: To examine the effects of SINT1 on AR transcriptional activity, both endogenous gene expression and reporter gene constructs that are regulated by AR were examined. The ability of SINT1 to directly inhibit transactivation of the AR NTD was tested using a chimera of AR NTD fused to the DNA-binding domain of Gal4. Reporter assays for glucocorticoid (GR) and progesterone receptor (PR) were measured to ensure specificity. BrdU incorporation was analyzed to indicate changes in proliferation of AR positive and negative cell lines. Animals bearing LNCaP subcutaneous xenografts were castrated when tumours were 100 mm³ and randomized into two groups. One week after castration, the animals were treated every 3 days with an intratumoral dose of SINT1(30 mg/kg) or vehicle.

Results: SINT1 blocked AR activity as measured by reduction in PSA mRNA and reporter activity induced by androgen. SINT1 reduced transactivation of AR NTD to baseline levels. SINT1 had no effects on transcriptional activities of related steroid receptors, GR and PR. SINT1 was effective in blocking androgen-induced proliferation in LNCaP cells but did not decrease proliferation of PC3 cells that lack functional AR. Importantly, some SINT1-treated CRPC xenografts regressed (mean = 103.3±11.97 mm³, n=7) with no change in animal body weight compared to DMSO-treated tumors (n=11) that grew to 153.7±11.87 mm³ (p=0.011).

Conclusions: Together these data support that SINT1 is a specific inhibitor of the AR NTD without effects on highly related steroid hormone receptors and no apparent toxicity in animals.

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AN EVALUATION OF THE INTERDISCIPLINARY LEARNING DELIVERED BY THE COMMUNITY HEALTH INITIATIVE BY UNIVERSITY STUDENTS (CHIUS)

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Keywords: medical education, interdisciplinary

Rationale: Interprofessional teamwork has been recognized as being vital to delivering optimal patient care. Student-run clinics (SRCs), which have developed across the country, seem to serve as an interdisciplinary learning tool for students across health disciplines. However, with the recent growth of SRCs over the past two decades, there is still little documentation of the quality of care and value in medical education. There is also a lack of Canadian data despite the presence of at least ten SRCs.

Objectives: The Community Health Initiative by University Students (CHIUS) was the first Canadian SRC to open its doors in 2000 in the Downtown Eastside of Vancouver, British Columbia. It has now been in operation for over ten years, and this project serves as the first formal evaluation of the values and impact of CHIUS involvement on student careers and perspectives on inner city health.

Methods: An online self-administered survey was distributed to clinic volunteers. Survey questions, ranked on a six-point Likert scale, asked students to evaluate issues including interdisciplinary relationships and awareness of inner city health issues. There was also a qualitative component for participants to comment on the impact of volunteering with CHIUS.

Results: 40 students responded to the online survey, with the greatest representation from pharmacy (27.5%), nursing (25%), and medicine (17.5%) out of eight health disciplines. 74.1% of respondents were satisfied with their working relationships with students of other health care fields, while 70.4% felt they had adequate opportunities to gain knowledge related to the practice and values of other health professions. 82.2% of students reported increased awareness of inner city health issues. Themes from qualitative analysis included increased knowledge of scope of practice of all health care disciplines and an appreciation for the social determinants of health.

Conclusions: Students reported a positive interdisciplinary learning experience with CHIUS that also enhanced their awareness of social issues affecting marginalized populations. As the first formal evaluation of a Canadian SRC, we provide qualitative and quantitative perspectives on interdisciplinary education in an SRC setting.

* This author is affiliated with the UBC Medical Journal. The selection process for abstracts was blinded and the author was not involved in the adjudication of any abstracts.

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A COMMUNITY-PARTNERED APPROACH TO DEVELOPING A MATERNAL AND NEWBORN CHILD HEALTH PROGRAM FOR RURAL VILLAGES IN NORTHERN INDIA

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Keywords: maternal health, newborn health, global health, Northern India, sanitation

Background:
Since 2010, the University of British Columbia’s medical student led Global Health Initiative (GHI) has established a partnership with a non-governmental organization (NGO) in the northern Indian Uttarakhand province. This NGO’s work focuses on health, education, and advocacy for women and girls. GHI undertook a needs assessment of women’s health in this community to better understand the challenges and to develop a collaborative framework to address the Millenium Development Goals of improving maternal health and reducing child mortality.

Methods & Results:
The team conducted needs assessments in several villages. Adolescent girls cited dietary limitations at home due to food shortages and priority that allows boys to eat first. Many girls admitted to feeling that they are a burden to their families. The girls receive less education than boys and have less understanding of health; no health or sexual education is provided to them. Women are financially dependent on men and have limited autonomy. As such, women often cannot access medical services and are left vulnerable to domestic violence. Even during pregnancy, they are expected to contribute fully to farming. Access to health care providers is limited due to distance to health care centres and inconsistencies in government-delivered programs that lead to a lack of trust.

Conclusion:
Currently, the UBC team provides an annual three-day workshop to NGO field workers. Collaborative maternal and adolescent girls’ workshops are ongoing in the communities. The goal is to gain local support and to ensure sustainability through engagement of local midwives, community leaders, and training of community health workers.

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ISLET AMYLOID POLYPEPTIDE INDUCES PANCREATIC ISLET INFLAMMATION BY ACTIVATION OF MACROPHAGE TOLL-LIKE RECEPTOR 2

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Keywords: diabetes, amyloid, inflammation, macrophage

Background: Aggregation of islet amyloid polypeptide (IAPP) to form amyloid fibrils contributes to the dysfunction of insulin-producing beta cells in patients with type 2 diabetes and islet transplant failure. IAPP aggregates share a common cross beta-sheet structure with other amyloids known to induce a potent pro-inflammatory response via activation of the membrane-bound pattern recognition receptor Toll-like receptor 2 (TLR2). We sought to determine whether IAPP acts as a trigger for islet inflammation by inducing TLR signalling in macrophages.

Methods: To determine whether IAPP induces TLR signalling, we screened a panel of HEK 293 cells overexpressing individual TLRs for activation of the downstream transcription factor NF-κB. Bone marrow-derived macrophages and pancreatic islets from wild-type and TLR2-deficient mice were treated with IAPP and assayed for pro-inflammatory cytokine expression. The contribution of resident macrophages to IAPP-induced islet gene expression was assessed by depleting islet phagocytes using clodronate-containing liposomes. To determine the role of macrophages in IAPP-induced islet dysfunction in vivo, wild-type or human IAPP-expressing mice were treated with clodronate liposomes (100 mg/kg intraperitoneally every 4 days) or PBS control liposomes and glucose tolerance was assessed after 4 weeks.

Results: Human but not rodent IAPP induced NF-κB activation in TLR2-overexpressing HEK 293 cells compared to the parental cell line (190±6 vs. 1.0±0.4 absorbance units; p<0.001). Human IAPP induced expression of the pro-inflammatory cytokines interleukin-1β (4.5±1.2 fold untreated; p<0.05), tumor necrosis factor-α (10.3±0.7; p<0.001), interleukin-6 (117±56; p<0.001), and macrophage chemotactant protein-1 (10.2±0.6; p<0.001) in isolated islets after 4 h. Upregulation of these cytokines in macrophages and islets treated with IAPP was significantly attenuated in cells from TLR2-deficient mice, suggesting that TLR2 signalling is required for this pro-inflammatory response. Macrophage depletion significantly reduced expression of both TLR2 and pro-inflammatory cytokines in cultured islets and improved glucose tolerance in mice with human IAPP-induced islet dysfunction.

Conclusions: These data suggest that islet macrophages are the major source of IAPP-induced pro-inflammatory cytokines, and that diverse amyloidogenic peptides act as endogenous stimuli for TLR2. Thus, manipulation of macrophage phenotype or blockade of TLR2 may limit IAPP-induced islet inflammation and beta cell dysfunction in type 2 diabetes and islet transplantation.

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NEPHROGENIC DIABETES INSIPITUS SECONDARY TO ACUTE INTERSTITIAL NEPHRITIS: CASE REPORT

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Keywords: nephrogenic diabetes insipitus, acute interstitial nephritis

Background

Nephrogenic diabetes insipitus (NDI) results from the resistance to the activity of antidiuretic hormone (ADH) resulting in decreased urinary concentrating ability. Patients typically present with polyuria, nocturia or polydipsia. NDI is most often secondary to acute tubular nephritis (ATN) and is rarely associated with acute interstitial nephritis (AIN). Here, we discuss the diagnosis and management of a rare case of NDI secondary to AIN.

Case

A 65 year old gentleman was admitted for recurrent fever and rigors. On review of systems, he complained of polyuria and nocturia, but no other symptoms that would suggest a potential source of infection. He has a past medical history of Sweet syndrome, previous cerebrovascular accident, bilateral pulmonary emboli, deep vein thrombosis and obstructive sleep apnea. His medications prior to hospitalization include prednisone, atorvastatin, clopidogrel and pantoprazole.

On admission, his creatinine was elevated at 179 from a baseline of 93 µmol/L. Urinalysis showed 0.3g/L of protein, 25-50 WBC (no eosinophils), and the presence of hyaline casts. He was treated with empiric antibiotics. Glomerulonephritis workup and cultures was negative. During his admission, his creatinine continued to rise. As his urine outputs were > 4L/day, he underwent a water deprivation test where his urine osmolarity remained unchanged at 250. With no change with administration of desmopressin, he was diagnosed with NDI and was treated with unlimited access to free water. CT showed no evidence of abscess or no hydronephrosis. However, there were marked bilateral enlarged kidneys with evidence of perinephric stranding. A renal biopsy was arranged as a diffuse renal infiltrative process could not be ruled out. Biopsy demonstrated acute interstitial nephritis, but not consistent with drug induced AIN. All potential medications that were associated with AIN were held. He was also given an increased dose of steroids. Subsequently, his polyuria improved and his creatinine normalized to baseline.

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MEDICAL STUDENTS’ SELF-REPORTED PREPAREDNESS AND ATTITUDES IN PROVIDING CARE TO ETHNIC MINORITIES

Presenting Author(s): Jonathan Yang and Jackson Chu

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Keywords: medical education, cultural competency training.

Background To assess medical students’ self reported preparedness to provide care to ethnic minorities, factors which influence preparedness, and attitudes toward cultural competency training.

Methods A cross-sectional study conducted in February 2012 which invited University of British Columbia medical students to participate in an online survey on student demographics, knowledge and awareness, preparedness and willingness, and personal attitudes. Of the 1024 eligible students, 301 students consented to and completed the survey.

Results Students across all year levels felt significantly less ready to provide care for non-English speaking Chinese patients compared to any patient. A significant percentage was less willing to work with Chinese patients with limited English proficiency. High skill in working with an interpreter was correlated with readiness: OR 4.447 (1.606 - 12.315), along with 3rd and 4th year level in medical school: OR 3.550 (1.378 – 9.141) and 4.424 (1.577 – 12.415) respectively. Only 172 respondents (57.2%) had been taught specific strategies to provide optimal care to ethnic minority patients by the program curriculum.

Conclusion Considering that self-assessment had been shown to be a valid predictor of examination scores and faculty evaluations, more opportunities for cultural competency training in the medical curriculum are warranted and would be welcomed by the students.

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