

# Adolescent medicine and general paediatrics I

## Concurrent session

12:45 PM

Thursday, January 25, 2018

### 1 PHYSICAL ACTIVITY CHARACTERISTICS OF ADOLESCENTS AT THE BASELINE OF A WEIGHT MANAGEMENT TRIAL

K Mishra\*, T Ngo, S Sanders, EY Jimenez, B Skipper, A Kong. *University of New Mexico School of Medicine, Albuquerque, NM*

10.1136/jim-2017-000663.1

**Purpose of study** Measurement of physical activity (PA) using wrist worn monitors is becoming more widely accepted due to commercial availability and increased wear time compliance over waist worn monitors. Little research is available to describe adolescent PA measured at the wrist. The objective of this study is to describe the PA characteristics of a sample of high school students as measured by GENEActiv accelerometers placed at the wrist.

**Methods used** In 2014 and 2015, 878 students in the 9th and 10th grades at 8 New Mexico high schools wore an accelerometer for at least 4 days. These accelerometer records were evaluated to determine average daily minutes of sedentary, light, moderate, and vigorous activity using a method developed for use in children. A multilevel mixed effects generalised linear model was used to compare average minutes of PA by sex and weight status. Repeated measures were used for day of the week comparison.

**Summary of results** 50.9% of subjects met PA guidelines of  $\geq 60$  min of moderate to vigorous PA (MVPA) per day. Our data shows a difference in vigorous minutes between weight categories but no significant difference in MVPA minutes. Students with a BMI  $\geq 95$  th percentile did 5 min of vigorous activity while students with a BMI  $< 85$  th percentile did 7 min ( $p < 0.001$ ). Friday was the most active day of the week, with an average MVPA of 65 min and Sunday was the least active with 45 min of MVPA. Male subjects had an average MVPA of 69 min per day while female subjects had an average of 59 min per day.

**Conclusions** MVPA estimates were higher than previously reported in other studies, possibly due to the placement of the accelerometer on the wrist vs waist in this study. Interventions for increasing PA and managing weight in adolescents may benefit from focusing on increasing weekend PA and increasing MVPA among girls. More information about the relationship between amount and timing of vigorous activity and health outcomes is needed.

### 2 16-YEAR-OLD MALE WITH RECURRENT VOMITING DIAGNOSED WITH CANNABINOID HYPEREMESIS SYNDROME

KA Dosani\*, R Alhosh. *University of Nevada Las Vegas School of Medicine, Las Vegas, NV*

10.1136/jim-2017-000663.2

**Case report** Cannabis is the most widely used illicit drug in United States. In 2016, 35.6% 12th graders had used marijuana during the year prior to the survey and 22.5% used it in the past month. With recent legalisation of cannabis use in certain states, the public perception of cannabis use is changing. Cannabinoid Hyperemesis Syndrome consists of constellation of symptoms like nausea, vomiting, abdominal pain, weight loss with a history of regular marijuana use. Hot showers are known to be comforting to these patient and abstinence is the only effective treatment. Unnecessary testing and hospitalizations in these patients can put a large burden on the healthcare system.

16-year-old male with no past medical history presented to ER with epigastric pain and vomiting for 1 week. The pain was constant, cramping, non-radiating and aggravated by food consumption. His physical exam was normal. He denied weight loss. Initial history for drug consumption was negative. His vomiting did not respond to multiple anti-emetics. His abdominal ultrasound and labs were normal. He underwent esophagogastroduodenoscopy which showed evidence of H. pylori infection. The patient was treated adequately and discharged after 2 weeks of hospitalisation. The patient returned to ER after 4 weeks with abdominal pain, nausea, vomiting and poor oral intake. He was discharged from ER after IV fluids and antiemetics. The patient returned to ER after 4 days with similar symptoms and was managed with antiemetics and fluids. His repeat esophagogastroduodenoscopy showed resolution of H.pylori infection. CT scan and gastric emptying study were normal. The patient was found to take long showers multiple times in a day and reported daily marijuana use for many months when questioned again. He was discharged with counselling and outpatient psychiatry referral. The patient was admitted to hospital 2 more times over the next 3 month for vomiting and abdominal pain and he reported cannabis use during each encounter.

This case report emphasises the importance of considering cannabinoid hyperemesis syndrome as a diagnosis in paediatric patients with cyclic vomiting as early diagnosis can avoid unnecessary investigations and prevent delays in treatment.

### 3 QUALITY OF HEALTH CARE REPORTED BY ADOLESCENTS WHO USE SUBSTANCES: FINDINGS FROM A STATEWIDE SURVEY OF SCHOOL-BASED HEALTH CENTRE USERS

R Sebastian\*, DV Rosero, MM Ramos. *University of New Mexico, Albuquerque, NM*

10.1136/jim-2017-000663.3

**Purpose of study** The purpose of this study was to assess the quality of care received by adolescent substance users who accessed care at school-based health centres (SBHCs) in New Mexico.

**Methods used** We analysed data from the 2015 New Mexico Department of Health student satisfaction survey of SBHC users, an anonymous survey that collects data on behavioural health risks, including substance use, and measures of health care quality. We conducted bivariate analyses of associations between substance use and demographic, risk, and quality of care measures. We conducted logistic regression analysis to examine the effect of substance use on the likelihood of reporting unmet needs for anticipatory guidance.

**Summary of results** In 2015, 47 SBHCs administered the survey to 1233 students. A third reported using at least one substance. Adolescents who used substances reported receiving more anticipatory guidance than students who did not use substances, and were more likely to report unmet needs for guidance around social and academic competence (19.8% vs 11.5%,  $p<0.001$ ), emotional well-being (20.6% vs 9.6%,  $p<0.001$ ), and substance use (16.7% vs 4.9%,  $p<0.001$ ). In logistic regression models adjusted for demographic characteristics, risk factors, and receipt of patient-centred care, adolescents who reported substance use were over 1.5 times as likely to report an unmet need for guidance, but the receipt of patient-centred care reduced the likelihood of having unmet needs. Adolescents who reported substance use reported similar levels of patient-centred care as their peers.

**Conclusions** Adolescents who use substances report receiving more anticipatory guidance than their peers, yet are still more likely to report unmet needs for guidance. Patient-centred care appears to be a protective factor; adolescents who receive patient-centred care are less likely to report unmet needs for guidance. Providing patient-centred care could increase the likelihood that adolescents, including those who use substances, receive the anticipatory guidance that they need.

#### 4 PAEDIATRIC OBESITY AND EXPOSURE TO ENVIRONMENTAL ADVERSITY

C Long\*, A Talmi, R Asherin. *University of Colorado, Denver, CO*

10.1136/jim-2017-000663.4

**Purpose of study** Exposure to four or more environmental adversity factors in childhood is associated with a 1.4 to 1.6 fold increase in obesity and myocardial infarction in adulthood and a 1.4 increase in coronary artery disease and stroke. Specifically, experiencing sexual abuse in childhood is associated with an elevated risk of obesity in adulthood. However, few studies have investigated adversity exposure and elevated weight in childhood. The aim of this study is to characterise the relationship between environmental adversity, paediatric obesity, and cardiovascular risk factor diagnoses.

**Methods used** A retrospective medical review of electronic medical records of 295 children aged 1 to 17 years old with elevated BMI was conducted. Records were obtained from Child Health Clinic at Children's Hospital Colorado, selecting for patients who received a mental health consultation following a weight measurement of BMI greater than the 85th percentile. Data collected included: demographics, cardiovascular risk related diagnosis, BMI and behavioural health flowsheets. Following EHR abstraction encounter data were manually coded for adversity using ATLAS.ti.

**Summary of results** The sample was predominately Latino/Hispanic (67.7%) and publicly insured (85.7%) patients. There were equal percentages of males and females (50.5% and 49.5%, respectively). On average, there were 1.5 adversity factors reported per child with 72.5% of patients reporting at least one adverse experience. The most common adversity factor reported was family separation (38%) followed by abuse (15%). Weight diagnoses were evenly distributed between overweight (25.8%), obese (40.3%), and morbidly obese (33.9%). There were 38 patients with cardiovascular risk factor diagnoses including: essential hypertension, hyperglycemia, hypertriglyceridemia, and dyslipidemia. After correcting for

age, race, gender, insurance, and financial factors families who reported housing instability were more likely ( $p=0.002$ ) to have children who were morbidly obese (61.3%) than families who did not report housing instability (30.7%).

**Conclusions** This study demonstrated the most common environmental adversity factor in the overweight or obese paediatric population was family separation. Finally, it demonstrated a dose dependent relationship between elevated weight in childhood and housing instability.

#### 5 PARENTAL EDUCATION LEVEL AND CHILDHOOD OBESITY

AJ Smith\*, E Pak, CM Abreu, E Williams, NM Malika, E Medina, M Baum. *Loma Linda University, Loma Linda, CA*

10.1136/jim-2017-000663.5

**Purpose of study** This study's goal was to determine if parents' education levels have any effect on their children's Body Mass Index (BMI).

**Methods used** Children years 9–15 were referred to 'Operation Fit', a weeklong day camp, based on their risk for or unhealthy weight (BMI>85 th percentile). The camp provided children with experiential lessons on nutrition and exercise. Parents and children were surveyed for lifestyle practices. Children's BMI's were measured. 377 children were included in this study.

**Summary of results** A logistic regression was conducted to assess if parents' education level affected a child's BMI. The odds of having a child that is overweight/obese is 1.64 units higher for those with higher education. When all variables are held constant those that are married are 0.13 units less likely to have a higher education than those that are single parents.

**Conclusions** These results suggest that parents' higher education levels may be adversely affecting their children's health. These results are surprising because it was suspected that higher education should lead to more informed and healthy lifestyle choices for families. However, higher education levels are associated with occupations with greater time demands which may play a factor in this outcome and warrant interest for further study. In addition, the study showed that single parents are more likely to have a higher education which further burdens the parent with time constraints that could result in a neglect of nutritional education and care for children. Even with greater financial resources, parents with higher education may be challenged with time constraints, but can be encouraged to be intentional with their children when it comes to nutrition and exercise.

#### 6 BASELINE DIETARY INTAKE DIFFERENCES BY MEASURES OF RURALITY IN TEENS PARTICIPATING IN A WEIGHT MANAGEMENT INTERVENTION

<sup>1</sup>T Ngo\*, <sup>2</sup>EY Jimenez, <sup>2</sup>AA Kuhlemeier, <sup>2</sup>R Euler, <sup>1</sup>K Mishra, <sup>2</sup>L Van Horn, <sup>2</sup>S Sanders, <sup>1</sup>A Kong. <sup>1</sup>University of New Mexico School of Medicine, Rio Rancho, NM; <sup>2</sup>University of New Mexico, Albuquerque, NM

10.1136/jim-2017-000663.6

**Purpose of study** A higher prevalence of obesity in rural vs urban locations may be due to differences in dietary intake. The objective of this study is to compare the baseline dietary intake of adolescents from public high schools in the

Southwest who participated in a cluster-randomised weight management intervention trial (ACTION PAC; ClinicalTrials.gov identifier: NCT02502383) by measures of rurality.

**Methods used** 991 students completed a Block Food Screener to report foods that were eaten in the last week. We examined differences in reported intake of total fruits, vegetables, potatoes, whole grains, meat/poultry/fish, dairy, legumes, saturated fat and added sugar by USDA rural urban commuting area (RUCA) codes and log population density (number of people/sq. mile in a zip code) using multilevel models with students nested within zip code.

**Summary of results** 70%–99% of participants consumed less than the recommended intake of fruits, vegetables, whole grains, dairy and legumes. RUCA codes were significantly associated with legume ( $p=0.03$ ), saturated fat ( $p=0.03$ ), and added sugar ( $p=0.03$ ) intake. On average, participants from the reference metropolitan area consumed 0.134 cup equivalents (CE) of legumes (SE 0.01), and participants from more rural areas consumed 0.035 (SE 0.026) and 0.050 (SE 0.034) more CE of legumes, respectively. Average saturated fat and added sugar intake did not differ between the reference metropolitan area and more rural areas, but was 2.82 g and 2.25 tsp higher, respectively, in the most rural areas compared to the less rural areas. There was an average increase in potato intake of 0.016 CE ( $p=0.02$ ) and in added sugar intake of 0.364 tsp ( $p=0.02$ ) for each 1 unit increase in log population density. All observed relationships persisted after controlling for parental education and income.

**Conclusions** Adolescents reported dietary intake inconsistent with current recommendations. Differences in reported dietary intake by RUCA code and log population density were small and not very consistent with a prominent role for dietary intake in explaining rural vs urban obesity disparities. Limitations of this study are limited variation in rurality and use of a food screener vs full FFQ.

## 7 EXERCISE OR DIET? WHICH IS A BETTER PREDICTOR OF BODY MASS INDEX IN CHILDREN?

CM Abreu\*, E Williams, AJ Smith, E Pak, E Medina, NM Malika, M Baum. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.7

**Purpose of study** In 2014 39.4% of San Bernardino County (SBC) students who were tested had an unhealthy body composition, with only 20.4% of teens in SBC meeting the Centres for Disease Control and Prevention's recommended one hour or more of physical activity each day. It is also reported that 72% of adults in San Bernardino are either overweight or obese. This is a major problem for the health-care system in SBC as rates of hypertension, heart disease, and diabetes are all higher than rates found in neighbouring counties. Early intervention and education is needed to help counteract this endemic.

**Methods used** Operation Fit is a 5 day fitness and nutrition summer day camp held for SBC children, ages 9–15 years old. Campers are referred through clinics and physicians associated with Loma Linda University. Invitations to the camp are also extended to siblings of the children who were referred to serve as a control group. Upon arrival at Operation Fit the campers filled out a survey that asked, among other things, 'How many days a week do you exercise?' and 'How many

helpings do you usually eat in one meal?' Their responses were then compared with their body mass index (BMI), also recorded upon arrival at the camp. A logistic regression was then conducted to assess whether weekly exercise or number of helpings was a better predictor of BMI among children at the camp.

**Summary of results** There was a total of 377 responses for the two analysed items. When all variables are held constant, those that exercise for one day or less are 2.65 units more likely ( $p<0.05$ ; 95% CI: 1.28 to 5.47) to be overweight/obese in relation to those who exercise 5 or more times a week. The number of helpings of meals at each meal did not show a significant relationship with BMI.

**Conclusions** This study showed that in children from SBC frequency of exercise seems to be a better predictor of BMI than the number of helpings at mealtime. These findings suggest that education and intervention programs for healthy living and maintaining a healthy weight should focus on getting children to exercise at least 5 days a week.

## Cardiovascular I—arrhythmias

### Concurrent session

12:45 PM

Thursday, January 25, 2018

## 8 ROLE OF THE CACC CHANNEL ANO1 IN ELECTROMECHANICAL COUPLING OF MURINE PULMONARY ARTERY SMOOTH MUSCLE

MD Young\*, N Leblanc, K Mayne. University of Nevada, Reno School of Medicine, Reno, NV

10.1136/jim-2017-000663.8

**Purpose of study** In VSMCs,  $\text{Ca}^{2+}$ -activated  $\text{Cl}^-$  channels (CaCCs) are encoded by the gene TMEM16A/Anoctamin 1 (ANO1). The mechanisms by which ANO1 influence the excitability of VSMCs remains to be elucidated due to questionable pharmacology and lack of a reliable genetic knock-down mouse model of ANO1.

The aim of this study was to re-evaluate the role of ANO1 in electromechanical coupling of pulmonary artery (PA) smooth muscle using newer generation ANO1 blockers and a novel smooth muscle-specific inducible ANO1 knockout mouse model (SMC-iANO1-KO).

**Methods used** Wire myography was used to determine the vascular reactivity to 5-HT of PA from wild-type and SMC-iANO1-KO mice. Calcium imaging experiments were also carried out using SMC-iGCaMP3 mice, which genetically express the  $\text{Ca}^{2+}$  biosensor GCaMP3 in smooth muscle cells.

**Summary of results** 5-HT elicited a dose-dependent contraction (0.01–30  $\mu\text{M}$ ) that was similarly inhibited (~50%–70%) by the ANO1 blocker  $\text{CaCC}_{\text{inh}}\text{-A01}$  (10  $\mu\text{M}$ ), the  $\text{Ca}_v1.2$  blocker nifedipine (1  $\mu\text{M}$ ) or the SERCA2 pump inhibitor cyclopiazonic acid (CPA; 10  $\mu\text{M}$ ). Genetic ablation of ANO1 produced a reduction in 5-HT-induced tone (~60% at 1  $\mu\text{M}$  5-HT) that was similar to that produced by  $\text{CaCC}_{\text{inh}}\text{-A01}$ , nifedipine or CPA.  $\text{Ca}^{2+}$  imaging experiments in the intact PA of SMC-iGCaMP3 mice revealed that 5-HT evoked spatially and temporally localised  $\text{Ca}^{2+}$  transients. These  $\text{Ca}^{2+}$  oscillations

were potently inhibited by CaCC<sub>Inh</sub>-A01 or nifedipine, and were abolished by CPA.

**Conclusions** In conclusion, 5-HT elicited highly localised Ca<sup>2+</sup> oscillations that were promoted by Ca<sup>2+</sup> entry through Ca<sub>v</sub>1.2, most likely involving transient depolarizations evoked by ANO1 activated by a balance between oscillatory SR Ca<sup>2+</sup> release through IP<sub>3</sub> receptors and Ca<sup>2+</sup> entry through Ca<sub>v</sub>1.2. We propose that the stable agonist-induced PA contraction results from the integration of stochastic and localised Ca<sup>2+</sup> events supported by a microenvironment comprising ANO1, Ca<sub>v</sub>1.2 and IP<sub>3</sub> receptors.

## 9 CAUSES OF SUDDEN DEATH AFTER HEART TRANSPLANTATION

A Hsu\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.9

**Purpose of study** Rejection, infection, and cardiac allograft vasculopathy remain the leading causes of post-heart transplant (HTx) mortality. However, sudden death (SD) in HTx patients (pts) is not well understood and poses a challenge in prevention. In a UNOS registry study (1987–2012), while non-SD rates improved over time, the rate of SD after HTx remained constant. We assessed incidence and potential causes of SD in HTx pts at our large single centre.

**Methods used** Between 2010–2016, we assessed 689 HTx pts, of which 110 died. Deaths were categorised into SD (n=14) and non-SD (n=96). SD was defined as pts in otherwise normal condition within 24 hours of death. We analysed causes of SD and non-SD including respiratory failure, arrhythmia, cardiac arrest, and rejection. Causes of death were determined by the care team or autopsy findings.

**Abstract 9 Table 1** Move causes of death

Causes of death	Sudden death (n=14)	Non-sudden death (n=96)	P-value
Arrhythmia/Cardiac Arrest	35.7% (5/14)	8.3% (8/96)	0.012
Cardiogenic Shock		3.1% (3/96)	
Myocardial Infarction	14.2% (2/14)	3.1% (3/96)	0.121
Heart Failure		6.3% (6/96)	
Stroke		4.2% (4/96)	
Pulmonary Embolus/Respiratory Failure	7.1% (1/14)	5.2% (5/96)	0.567
Rejection	7.1% (1/14)	10.4% (10/96)	1.000
Infection		14.6% (14/96)	
Malignancy		4.2% (4/96)	
Primary Graft Dysfunction		5.2% (5/96)	
Multiple Organ System Failure		3.1% (3/96)	
Other/Unknown	35.7% (5/14)	32.3% (31/96)	0.770
<b>Risk factors</b>	<b>Sudden death after heart transplant (n=14)</b>		
Mean Recipient Age±SD	60.4±10.1		
% Female	21.4% (3/14)		
Pre-Transplant Diabetes	35.7% (5/14)		
Pre-Transplant Hypertension	57.1% (8/14)		
Pre-Transplant Coronary Artery Disease	57.1% (8/14)		

**Summary of results** 12.7% (14/110) of pts had SD. The major causes of SD were presumed arrhythmia/cardiac arrest, myocardial infarction, pulmonary embolus, and rejection. Causes of non-SD were analysed (table 1). A majority of SD pts were male (78.6%) and had both pre-HTx hypertension (57.1%) and pre-HTx coronary artery disease (57.1%). Mean recipient age was >60 years in this group. No risk factors were significant for SD by multivariate analysis.

**Conclusions** The incidence of SD after HTx was 12.7%. Presumed arrhythmia/cardiac arrest was the most common cause of SD. No significant risk factors were identified. The most common cause of non-SD was infection followed by rejection. Larger sample sizes are needed to confirm these findings.

## 10 SMALL ANIMAL MODEL FOR TESTING DRUG-INDUCED CARDIAC ELECTROPHYSIOLOGICAL INTERACTIONS

CC Morris\*, I Chinyere, J Lancaster, JW Koevary, M Pierce, S Goldman, E Juneman. University of Arizona, Tucson, AZ

10.1136/jim-2017-000663.10

**Purpose of study** The purpose of this study was to develop an *in-vivo* small animal model to detect drug-induced cardiotoxicity and arrhythmogenicity. Drugs that cause arrhythmias and cardiotoxicity can be fatal. Furthermore, multiple therapies previously approved by the Food and Drug Administration have been withdrawn from market because they were found to cause potentially fatal arrhythmias such as ventricular tachycardia (VT). The current gold-standard *in-vitro* screening methods detect single ion channel interactions but do not predict whole-organ manifestations. We hypothesise that a small animal *in-vivo* model could more accurately predict whole-organ drug-induced cardiac electrophysiological interactions.

**Methods used** We have a rat model of chronic heart failure (CHF) that utilises occlusion of the left coronary artery. SHAM and CHF rats were studied using a median sternotomy to expose the epicardium. We recorded a 3-lead electrocardiogram, epicardial monophasic action potentials (MAPs) with a concentric bipolar electrode, and bipolar and unipolar voltage electrograms with a quadropolar catheter. Signals were processed using a biosignal amplifier and our custom MATLAB software. Programmed electrical stimulation was utilised to induce VT. Rats were paced using a drive drain of eight S1 stimulations delivered with an electrode to the right ventricular epicardium followed by an early S2 stimulation to induce VT.

**Summary of results** MAP and electrogram tracings were successfully recorded in Sprague-Dawley rats. The corrected QT interval and MAP duration at 90% of repolarization was calculated. Programmed electrical stimulation was utilised to measure the effective refractory period and induce VT as a means of quantifying arrhythmogenic potential. The fraction of induced sustained VT episodes for SHAM and CHF rats were 0/8 (0%) and 10/14 (71.4%), respectively (p<0.05).

**Conclusions** The preliminary data indicates that the small animal model shows promise for cardiotoxicity screening of pre-clinical therapies. The capability to test arrhythmogenicity and induce VT *in-vivo* could offer a benefit in predicting whole-organ manifestations of drug-induced cardiotoxicity.



11

# RHYTHM PROFILE AFTER DEFIBRILLATION IS RELATED TO SURVIVAL AFTER CARDIAC ARREST FROM PRIMARY VENTRICULAR FIBRILLATION

<sup>1</sup>S Bhandari\*, <sup>1</sup>J Doan, <sup>2</sup>J Blackwood, <sup>3</sup>J Coult, <sup>1,2</sup>P Kudenchuk, <sup>1,3</sup>L Sherman, <sup>1,2</sup>T Rea, <sup>1</sup>H Kwok. <sup>1</sup>University of Washington, Bellevue, WA; <sup>2</sup>King County Emergency Medical Service, Seattle, WA; <sup>3</sup>University of Washington, Seattle, WA

10.1136/jim-2017-000663.11

**Purpose of study** Treatment protocols during CPR are based on snapshot rhythm analyses done at 2 min intervals, neglecting possible transient rhythms in the intervening period. With novel technologies now able to provide continuous rhythm analysis, our purpose was to describe the prevalence of dynamic rhythm profiles following attempted defibrillation and to assess their relationship to survival.

**Methods used** The study included a cohort of primary ventricular fibrillation (VF) cases treated by King County EMS from 2011–2015. Rhythms were manually annotated as VF, organised (ORG), or asystole (ASYS) for each second during 2 min after the first shock. We used chi-square tests to assess statistical relationships between rhythm profile and survival to hospital discharge.

**Abstract 11 Table 1** Rhythm profiles and survival

Rhythm at 2 min	Transient rhythm	Survival (%)
ORG	None (ORG throughout)	80/131 (61)
ORG	ASYS	31/59 (53)
ASYS	None (ASYS throughout)	11/55 (20)
ASYS	ORG	1/6 (7)
VF	None (VF throughout)	39/123 (32)
VF	ORG	89/130 (69)
VF	ASYS	18/65 (28)
TOTAL		269/569 (47)

**Summary of results** Transient rhythms occurred in 259 of 569 cases (46%) and were present in 4 of 7 rhythm profiles (table 1). Overall, 47% of patients survived, and survival varied according to the rhythm at 2 min: ORG (58%, n=111), ASYS (20%, n=12), and VF (46%, n=146), p=0.02. Among patients with an ORG or ASYS rhythm at 2 min, the presence of a rhythm transition was not associated with survival. However, among patients with VF at 2 min, prognosis was significantly better for patients with a transient ORG rhythm (69%)

than with VF throughout (32%) or transient ASYS (28%), p<0.001.

**Conclusions** Rhythm transitions are common after attempted defibrillation. In patients with VF at 2 min, the intervening rhythm profile was associated with survival. If confirmed by external studies, the dynamic rhythm profile in real-time could have therapeutic implications.

12

# UTILITY OF ELECTROCARDIOGRAM SCREENING PRIOR TO INITIATION OF PROPRANOLOL TREATMENT IN INFANTS WITH HEMANGIOMA

<sup>1,2</sup>C Wong\*, <sup>2</sup>M Abad, <sup>2</sup>A Brar, <sup>2</sup>S Elmashat, <sup>2</sup>S Mahmood, <sup>2</sup>S Singh, <sup>2</sup>S Xu, <sup>2</sup>M Zhao, <sup>2,3</sup>B Afghani. <sup>1</sup>Tulane University, New Orleans, LA; <sup>2</sup>University of California, Irvine School of Medicine, Irvine, CA; <sup>3</sup>Children's Hospital of Orange County, Orange, CA

10.1136/jim-2017-000663.12

**Purpose of study** Routine electrocardiogram (ECG) screening is performed by majority of physicians prior to initiation of propranolol for treatment of infantile hemangioma. The objective of this study is to determine the utility of ECG screening prior to start of propranolol in patients with infantile hemangioma.

**Methods used** We reviewed the literature using Pubmed and Google Scholar search engines using keywords: 'hemangioma,' 'propranolol,' and 'ECG' or 'EKG'. Only studies that evaluated the value of ECG screening in infants less than one year of age were included in our results.

**Summary of results** We found 17 articles and of those, four studies satisfied our inclusion criteria (see table 1). Patients with history of cardiovascular symptoms, such as hypotension, heart failure and 2nd and 3rd degree atrioventricular blocks were excluded from most of the studies. ECG abnormalities were found in 5.9% to 42.6% of patients prior to starting propranolol. Despite ECG abnormalities, after consultation with cardiologist, all patients were started on propranolol and tolerated it without difficulty.

**Conclusions** None of the healthy appearing infants with abnormal ECG prior to start of propranolol were excluded from treatment with propranolol, and all infants completed the treatment course. Further large prospective studies are needed to confirm that ECG screening may not be cost effective prior to start of propranolol in all infants with hemangioma.

**Abstract 12 Table 1** Analyses of studies on the utility of ECG after initiation of propranolol treatment of infantile hemangiomas

First author (year published)	Total patients with ECG	Number of patients with abnormal ECG	% of patients with abnormal ECG who were started on propranolol	Abnormalities identified
Streicher J (2016)	198	49 (24.75%)	49 (100%)	Not specified.
Ji Y (2017)	51	3 (5.88%)	3 (100%)	2 nonspecific intraventricular conduction delays, 1 right bundle branch block
Yarbrough K (2016)	162	69 (42.59%)	69 (100%)	16 left ventricular hypertrophy, 8 right ventricular hypertrophy, 6 sinus bradycardia, 5 sinus tachycardia, 5 ST elevation (possible early repolarization, 4 right axis deviation, 2 nonspecific T-wave changes, 1 left axis deviation, 1 biventricular hypertrophy, 21 other abnormal results
Raphael M (2015)	109	7 (6.5%)	7 (100%)	Not specified.

## 13 REMOTE HAEMODYNAMIC MONITORING IN PATIENTS EXCLUDED FROM CHAMPION TRIAL

O Yousefian\*, A Wolfson, D Shavelle. USC, Los Angeles, CA

10.1136/jim-2017-000663.13

**Purpose of study** To evaluate characteristics of patients receiving the CardioMEMS™ HF Sensor in contemporary clinical practice based upon inclusion and exclusion criteria as defined in the CHAMPION Trial.

**Methods used** Retrospective chart review was performed on 73 patients from the University of Southern California who underwent implantation of CardioMEMS™ HF Sensor for clinical indications. Patients were categorised based upon inclusion and exclusion criteria as defined in the CHAMPION Trial and placed in two groups; CHAMPION Eligible (n=43) and CHAMPION Ineligible (n=30).

**Summary of results** There was no significant difference between groups in respect to demographics (age, gender, body mass index, baseline left ventricular ejection fraction, baseline pulmonary artery pressures, co-morbid medical conditions). Although HF-related hospitalizations in the preceding year were similar, the CHAMPION Ineligible group had a significantly greater number of non-HF hospitalizations in the preceding year. CHAMPION Trial exclusion criteria included 3 patients with a history of recurrent pulmonary embolism or deep venous thrombosis, 2 patients with a major cardiovascular event in the two months prior to device placement and 9 patients implanted with a Cardiac Resynchronization Device within a 3 month window of sensor implantation. Seven patients had an estimated glomerular filtration rate <25 mL/min or were on chronic renal dialysis. One patient had congenital heart disease and 2 patients could not tolerate either aspirin or clopidogrel. Ten patients were implanted with CardioMEMS™ HF Sensor after implantation of a durable left ventricular assist device.

**Conclusions** Approximately 40% of patients receiving CardioMEMS™ HF Sensor in clinical practice would have been excluded from participation in the CHAMPION trial. Further follow up of this CHAMPION Ineligible patient cohort is warranted to evaluate if they will experience a reduction in HF hospitalisation rates.

## 14 LESSOR SEVERITY OF RECURRENT TAKOTSUBO CARDIOMYOPATHY WHILE TAKING ANGIOTENSIN II RECEPTOR BLOCKER AND BETA BLOCKER

<sup>1</sup>N Zagelbaum\*, <sup>2</sup>A AlBadri, <sup>3</sup>C Shufelt, <sup>3</sup>J Wei, <sup>3</sup>N Bairey Merz. <sup>1</sup>Westchester Medical Centre, White Plains, NY; <sup>2</sup>Emory University, Atlanta, GA; <sup>3</sup>Cedars Sinai Heart Institute, Los Angeles, CA

10.1136/jim-2017-000663.14

**Case report summary** Takotsubo cardiomyopathy (TC) is a rare syndrome following acute stress. Recurrence occurs in 2%–12% of patients yearly. We present a case of recurrent TC treated with an angiotensin receptor blocker (ARB) and beta blocker (BB). Repeat episode showed less severe cardiac enzyme elevation, echocardiogram and hospital course. We hypothesise her medication regimen contributed to a milder manifestation.

**Background** TC is characterised by transient systolic and diastolic dysfunction, left ventricular wall motion abnormalities

and troponin I (TnI) elevations with normal coronary arteries. No consensus exists for medical treatment.

**Case presentation** A 59 year old female presented with severe chest pain lasting 12 hours. ECG showed ST-depressions. Labs were significant for elevated TnI of 13 ng/ml and BNP >600 ng/ml. Transthoracic echocardiogram (TTE) demonstrated left ventricular ejection fraction of 35% and hypokinesis consistent with TC. Catheterization showed no obstruction. She was discharged on losartan and carvedilol.

4 months later she experienced similar chest pain. Lab tests revealed mildly elevated TnI (0.7 ng/ml) and a normal BNP. ECG, TTE and catheterization were unremarkable. She was seen at our clinic 1 month later for cardiology consultation. Daily medications included carvedilol, losartan, isosorbide mononitrate, aspirin, and nitroglycerin. The ARB was discontinued and an angiotensin-converting-enzyme inhibitor (ACEi) was started. She has now been symptom free for 6 months.

**Discussion** Several hypotheses exist regarding pathogenesis. Excessive epinephrine after beta-adrenergic response may result in a decline of cardiac myocyte activity. Catecholamines impact endothelial function resulting in myocyte toxicity. These theories are supported by the relationship between TC and oestrogen withdrawal as patients lose protection from catecholamine toxicity, calcium overload and oxidative stress. BBs have been explored as potential treatment. To date, no improvement in recurrence or mortality has been established although a large multi-centre study found improved survival rates 1 year after TC event with ACEi/ARB treatment.

## 15 CARDIOVASCULAR SAFETY OF METHYLPHENIDATE (RITALIN) IN TREATING PAEDIATRIC PATIENTS WITH ADHD (ATTENTION DEFICIT HYPERACTIVITY DISORDER): A LITERATURE REVIEW

<sup>1,2</sup>A Bui\*, <sup>2</sup>A Joseph, <sup>2</sup>D Sam, <sup>2</sup>C Lane, <sup>2</sup>S Madireddy, <sup>2,3</sup>B Afghani. <sup>1</sup>University of Southern California, Los Angeles, CA; <sup>2</sup>University of California, Irvine, Irvine, CA; <sup>3</sup>Children's Hospital of Orange County, Orange, CA

10.1136/jim-2017-000663.15

**Purpose of study** Guidelines for monitoring of ADHD patients treated with methylphenidate are lacking. The purpose of this study was to determine the cardiovascular side effects of methylphenidate in paediatric patients with ADHD.

**Methods used** A search of online databases such as PubMed, Google Scholar, and Web of Science was executed to find studies related to this topic. Only articles published after year 2000 that reported the cardiovascular side effects of methylphenidate (separated from other stimulants) in paediatric ADHD patients were included.

**Summary of results** Six studies were found (see table 1). All of the studies concentrated on monitoring blood pressure (BP) and heart rate (HR). The follow-up period ranged from 6 weeks to 2 years. Statistically significant changes in diastolic and systolic BP ranged from -4.3 to +5.87 and changes in the HR ranged from 3.9 to 6.87. However, these changes were not clinically significant, and the parameters stayed within normal range. Electrocardiogram (ECG) screening was included in a few studies and it did not lead to changes in management. Patients with higher body mass index (BMI) seemed to have higher BP at baseline. The sample sizes of the studies were too small to detect a correlation between cardiovascular effects and other parameters such as dosage or comorbidities.

**Abstract 15 Table 1** Studies evaluating the effects of methylphenidate on heart rate and blood pressure

Author, year	Age (years)	Number of patients analysed	Measurements of cardiovascular risk	Follow-up period	Results*
Arcieri <i>et al.</i> , 2012	6–18	351	BP, HR, ECG	Monthly for 24 months	Increase in HR (2.1 bpm) at 6 months, decrease in diastBP (−3.9 mm Hg) and HR (−3.8 bpm) at 24 months
Hammerness <i>et al.</i> , 2009	12–18	114	BP, HR, ECG, metabolic panel	Weekly for 6 months	Increase in systBP (2.1 mm Hg) and HR (4.3 bpm) at 6 weeks and syst BP (1.9 mm Hg) and HR (0.6 bpm) at 6 months
Kratochvil <i>et al.</i> , 2002	7–15	44	BP, HR, weight	Weekly for 10 weeks	Increase in systBP (2.95 mm Hg) and diastBP, (3.35 mm Hg), and HR (5.56 bpm) at 10 weeks
Wilens <i>et al.</i> , 2004	6–13	432	BP, HR, weight	Monthly for 1 year	Increase in systBP (1.6 mm Hg), diastBP, (1.4 mm Hg) and HR (1.1 bpm) at 12 months
Lee <i>et al.</i> , 2013	12–18	55	BP, HR, weight	Bi-monthly for 3 months	Increase in systBP (4.27 mm Hg), diastBP (5.87 mm Hg), and HR (3.8 bpm) at 12 weeks
Yildiz <i>et al.</i> , 2010	8–14	11	BP, HR, weight	Endpoint at 12 weeks	Not statistically significant due to small sample size.

\*Only statistically significant changes are reported

**Conclusions** Although the majority of the studies confirmed a risk of increased diastolic and systolic BP as well as HR in paediatric ADHD patients within few months to 2 years of initiation of methylphenidate, the differences did not seem clinically significant, and treatment was not altered. Data on long-term treatment is limited and therefore, we recommend regular monitoring of cardiovascular parameters in patients on long-term methylphenidate.

## 16 PREVALENCE AND RAMIFICATION OF BRADYDYSRHYTHMIAS AFTER BARIATRIC SURGERY

A Parekh\*, S Bahl, A Ghandforoush, A Froush. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.16

**Purpose of study** There have been several reports of sinus bradycardia (SB) occurring after bariatric surgery, however, no study has compared SB between Roux-en-Y gastric bypass and the sleeve gastrectomy.

**Methods used** Data Collection –Data was collected through uniform query of community hospital database of patients with inclusion criteria of undergoing bariatric procedure (Roux-en-Y or gastric sleeve) at least 1 month prior to our data collection, no prior history of myocardial infarction, and not medication induced bradycardia.

**Summary of results** Seven of the 45 patients (16%) experienced transient or persistent asymptomatic SB postoperatively, of which 22% (2/9) of them had undergone (Roux-en-Y). HRR was significantly greater in patients with SB (average 123 beats/min) compared to without SB (average 96 beats per minute). SB patients had greater BMI reduction compared to without SB (average 17.25 and 7.98, respectively,  $p < 0.05$ ). Using univariate logistic analysis, the odds of developing SB were 1.127 and 1.149 with a percent decrease in BMI (95% CI: 1.031 to 1.23,  $p = 0.008$ ) or increase in HRR (95% CI: 1.047 to 1.261,  $p = 0.0034$ ), respectively.

**Conclusions** Eighteen percent with Roux-en-Y experienced SB compared to 21% with gastric sleeve, hence, the type of bariatric surgery does not play a role. It took an average of 6 months to develop SB postoperatively. Further studies warranted to better understand physiological changes in weight loss.

## Endocrinology and metabolism I

### Concurrent session

12:45 PM

Thursday, January 25, 2018

## 17 METFORMIN IMPROVES VASCULAR HAEMODYNAMIC FUNCTION IN YOUTH WITH TYPE 1 DIABETES

KJ Nadeau\*, M Schafer, P Bjornstad, L Browne, U Truong, M Green, JE Reusch. *University of Colorado Anschutz Medical Campus, Aurora, CO*

10.1136/jim-2017-000663.17

**Purpose of study** Cardiovascular disease (CVD) remains the leading cause of mortality in type 1 diabetes (T1D) and relates to insulin resistance (IR). We previously showed that metformin improves markers of IR (insulin dose, body composition) in obese T1D youth. Yet, little is known about vascular haemodynamic dysfunction in youth with T1D, nor about metformin's influence on vascular function in T1D. Thus, we hypothesised that 1) youth with T1D would have impaired vascular function compared to controls, and 2) metformin would improve IR and vascular function in youth with T1D.

**Methods used** 50 T1D youth ages 12–21 years (40% with BMI  $\geq$  the 90<sup>th</sup> percentile) were randomised 1:1 to 3 months of 2000 mg metformin or placebo daily. All youth underwent an ascending (AA) and descending aortic (DA) MRI, DXA for body composition, and hyperinsulinemic euglycemic clamp (80 mU/m<sup>2</sup>/min insulin) following overnight intravenous glycemic control. Insulin sensitivity (M/I) was expressed as glucose infusion rate (mg/kg/min)/insulin (uIU/uL). 24 non-diabetic youth of similar age and sex distribution underwent identical assessment for comparator data.

**Summary of results** Compared to non-diabetic controls, T1D youth demonstrated lower M/I and impaired vascular function: elevated pulse wave velocity (PWV) (AA:  $3.7 \pm 0.2$  vs  $2.5 \pm 0.4$ ,  $p = 0.045$ , DA:  $4.2 \pm 0.2$  vs  $3.1 \pm 0.3$ ,  $p = 0.02$ ) and wall shear stress (AA:  $10.9 \pm 0.4$  vs  $8.7 \pm 0.5$ ,  $p = 0.003$ , DA:  $15.5 \pm 0.6$  vs  $10.7 \pm 0.7$ ,  $p < 0.0001$ ). Compared to the placebo group, the metformin group experienced a significant improvement in M/I ( $+12.18 \pm 3.16$  vs  $-2.37 \pm 3.64$ ,  $p = 0.005$ ), BMI and fat mass

( $p < 0.05$ ). The metformin group also had a reduction in PWV at the AA ( $-1.1 \pm 1.1$  vs  $4.1 \pm 1.6$  m/s,  $p = 0.039$ ) and reduction of wall shear stress at the AA ( $-0.3 \pm 0.4$  vs  $1.5 \pm 0.5$  N/m<sup>2</sup>,  $p = 0.027$ ) compared to the placebo group, even after adjusting for change in M/I, BMI and blood pressure. DA PWV and WSS at the DA also tended to decrease with metformin.

**Conclusions** Youth with T1D show IR and impaired vascular haemodynamic function, namely arterial stiffness and abnormal aortic wall shear stress compared to their non-diabetic peers. Metformin therapy over 3 months in T1D youth improved IR, BMI, fat mass and vascular haemodynamic dysfunction, and may hold promise as a cardiovascular protective intervention in T1D.

## 18 HAEMOGLOBIN A1C PREDICTS AVERAGE GLUCOSE BY CONTINUOUS GLUCOSE MONITORING IN YOUTH WITH CYSTIC FIBROSIS

E Hope\*, J Thurston, T Vigers, L Pyle, P Zeitler, KJ Nadeau, CL Chan. *University of Colorado Denver, Denver, CO*

10.1136/jim-2017-000663.18

**Purpose of study** Haemoglobin A1c (A1c) is considered a poor diabetes screening test in cystic fibrosis (CF) and is thought to underestimate glycemia for reasons such as increased red blood cell turnover. However, few studies have directly assessed the relationship between A1c and average glucose in CF. We sought to determine the relationships between glycemic markers—A1c, fructosamine (FA), glycated albumin (%GA), and 1,5 anhydroglucitol (1,5AG)—and average sensor glucose (ASG) measured by continuous glucose monitoring (CGM), and to determine if alternate markers better predict ASG than A1c in CF.

**Methods used** CF youth and healthy controls (HC), 6–25 years, wore CGM up to 7 days. A1c, FA, %GA, 1,5AG, and an oral glucose tolerance test were collected. CF patients with normal glycemia, abnormal glycemia, and CF-related diabetes were included. Pearson correlations assessed the relationship between A1c, FA, %GA, and 1,5AG vs ASG. Linear regressions determined if alternate markers added to ASG prediction after adjusting for A1c. The regression line between A1c and ASG was compared in CF vs HC.

**Summary of results** CF ( $n = 93$ ) and HC ( $n = 29$ ) wore CGM  $5.2 \pm 1$  days. CF youth were  $14 \pm 3$  years, 47% M, BMI z-score  $-0.1 \pm 0.8$ . There were no differences in age, sex, BMI, nor ethnicity between CF and HC. For CF (mean  $\pm$  SD): A1c =  $5.7\% \pm 0.8\%$ , FA =  $243 \pm 34$  mmol/L, %GA =  $13.0\% \pm 2.7\%$ , 1,5AG =  $18.9 \pm 7.4$  mcg/mL and ASG =  $116 \pm 29$  mg/dL. All glycemic markers correlated with ASG: A1c ( $r = 0.86$ ,  $p < 0.0001$ ), FA ( $r = 0.69$ ,  $p < 0.0001$ ), %GA ( $r = 0.83$ ,  $p < 0.0001$ ), and 1,5AG ( $r = 0.26$ ,  $p = 0.01$ ). After adjusting for A1c, %GA still predicted ASG ( $p = 0.0009$ ), but FA and 1,5AG did not. The relationship between ASG and A1c did not differ in CF vs controls ( $p = 0.44$ ).

**Conclusions** No alternate glycemic marker correlated with ASG better than A1c. A novel finding is %GA adds to prediction of ASG beyond A1c in CF. Furthermore, the relationship between A1c and ASG was similar in CF and HC. Therefore, A1c does not underestimate average glucose in CF. Further study is required to determine whether CF youth with prediabetes and diabetes have greater hyperglycemia than youth with other forms of diabetes, when comparing glycemic measures other than ASG for a given A1c.

## 19 ASSESSING THE CONTINUATION OF GLP-1 WHEN WEIGHT AND A1C ARE NOT REDUCED

<sup>1</sup>K Duncan, <sup>1,2</sup>A Swislocki\*, <sup>1</sup>R Zhou. <sup>1</sup>VA Northern California, Sacramento, CA; <sup>2</sup>UC Davis School of Medicine, Sacramento, CA

10.1136/jim-2017-000663.19

**Purpose of study** Glucagon-like peptide-1 agonists (GLP-1) are quickly gaining favour for haemoglobin A1C lowering, weight reduction, and improved cardiovascular outcomes. These agents have a high cost and limited data in the veteran's administration (VA) population. The primary objective was to evaluate use of GLP-1s determining provider adherence to VA criteria based on weight loss and A1C reductions. Other objectives include assessment of blood pressure, lipids, and cost savings.

**Methods used** In this retrospective project patient information was extracted from a regional VA data mart. Patients were included with prescriptions for a GLP-1 and must have had A1C and weight at both baseline and in first 15 months of therapy. Those who did not achieve a 0.5% reduction in A1C and/or a 2 kg decrease after 1 year on a GLP agent were assessed for therapy modifications. Blood pressure and lipid related labs for all patients were also measured to evaluate glucose control, cardiovascular health, and weight loss. Pearson's correlation and multiple regression analysis was used to analyse data, comparing follow up labs and vitals to baseline and alpha was set at 0.05.

**Summary of results** Three-hundred ninety patients met inclusion criteria. Average A1c decreased by 0.81% and weight was decreased by 4.4 kg. At 1 year, 242 patients had both weight and A1c measured, and of those, 92 (58%) patients had A1c reduction of at least 0.5%, 94 (59%) patients had  $< 2$  kg change in weight. 57 (36%) patients met both of those outcomes and 31 (19%) did not meet either target outcomes. Age but no other significant differences were found between groups who met both weight and A1c outcomes. No correlation was found between weight and A1c change at each quarter ( $p > 0.05$ ) however weight change was correlated with systolic blood pressure change ( $p = 0.03$ ). Multiple regression for meeting weight and A1c target outcomes, changes at quarters 1–3 all correlated to success at 1 year ( $p < 0.05$ ).

**Conclusions** Weight change is likely independent of A1c changes in patients receiving GLP-1s for diabetes control. Changes at 3 months were reflective of changes at 1 year, and GLP-1 therapy may be assessed earlier. Decrease in weight was associated with decreases in systolic BP, with non-statistically significant trend on diastolic BP.

## 20 YOUTH WITH TYPE 2 DIABETES HAVE HEPATIC AND PERIPHERAL IR

<sup>1,2</sup>J Stuppy\*, <sup>1</sup>M Green, <sup>1</sup>B Bergman, <sup>3</sup>J Thurston, <sup>1</sup>A Baumgartner, <sup>1</sup>S Bacon, <sup>1</sup>A Scherzinger, <sup>1,3</sup>L Pyle, <sup>1</sup>KJ Nadeau. <sup>1</sup>University of Colorado Anschutz Medical Campus, Aurora, CO; <sup>2</sup>Rocky Vista University, Parker, CO; <sup>3</sup>Colorado School of Public Health, Aurora, CO

10.1136/jim-2017-000663.20

**Purpose of study** Adolescents with type 2 diabetes have severe insulin resistance (IR), due in part to the effects of puberty, and this relates to co-morbidities such as cardiovascular disease and fatty liver disease. Adults with type 2 diabetes have multi-tissue IR which has guided therapeutic developments, but this



has not been firmly established in youth. Therefore, we sought to assess adipose, hepatic, and peripheral insulin sensitivity in adolescents with and without type 2 diabetes.

**Methods used** Forty-eight overweight/obese 12–19 year-old, pubertal, sedentary adolescents (27 with type 2 diabetes). Insulin action was measured with a four-phase hyperinsulinemic euglycemic clamp (basal, 10, 16 and 80 mU/m<sup>2</sup>/min) with glucose and glycerol stable isotope tracers. Mean pubertal stage, habitual physical activity and BMI were similar between those with and without diabetes.

**Summary of results** Adolescents with type 2 diabetes had a higher rate of lipolysis ( $p=0.012$ ) endogenous glucose release ( $p<0.0001$ ) and a lower clearance rate of glucose ( $p=0.002$ ) during hyperinsulinemia than obese controls. In type 2 diabetes youth only, peripheral IR was related to FFA concentrations, hepatic fat and central obesity and inflammatory markers; hepatic IR related to central obesity and adipose IR.

**Conclusions** Adolescents with type 2 diabetes have adipose, hepatic and peripheral IR compared to well-matched controls. Youth with type 2 diabetes may benefit from interventions directed at improving IR in these tissues, an area in need of further research.

## 21 HEPATIC STIFFNESS RELATES TO MARKERS OF HEPATIC CELLULAR STRESS AND POST-PRANDIAL METABOLISM IN OBESE ADOLESCENT GIRLS

<sup>1</sup>M Green\*, <sup>1</sup>A Carreau, <sup>1</sup>T Jensen, <sup>1</sup>Y Garcia-Reyes, <sup>1</sup>H Rahat, <sup>2</sup>D Befroy, <sup>3</sup>B Newcomer, <sup>1</sup>M Brown, <sup>1</sup>K Nadeau. <sup>1</sup>University of Colorado, Aurora, CO; <sup>2</sup>Peak Analytics, London, UK; <sup>3</sup>James Madison University, Harrisonburg, VA

10.1136/jim-2017-000663.21

**Purpose of study** Key events leading to inflammation, extracellular matrix deposition and progression of NAFLD to NASH in a paediatric population remains elusive. Glucose and fat metabolism, presence of fibrosis and markers of hepatic endoplasmic reticulum stress have been described in NAFLD progression in adults, but never comprehensively assessed in youth. Our aim was to evaluate whether liver stiffness, a marker of fibrosis, correlates with liver phospholipid metabolites reflective of hepatocellular stress or metabolic alterations in female adolescents at risk for NAFLD.

**Methods used** Fasting 31 phosphorus-MR Spectroscopy and MR elastography (MRE) using a 3T MRI were conducted in 15 severely obese female adolescent. Liver signals without contamination of abdominal muscles were selected for 31 P spectrum peak area analysis using jMRUI with AMARES quantification algorithm. For MRE analysis, liver ROI were manually selected for analysis of the average mean stiffness controlled for area dimension. A 6 hour OGTT was also performed.

**Summary of results** The subjects had a mean age of 15.1 years, median BMI of 98.4%ile and median liver stiffness of 2.47 kPa (IQR 2.30–2.89 kPa). Phosphodiester (PDE)/ATP was associated with higher liver stiffness ( $r=0.60$ ;  $p<0.01$ ). Whole body insulin sensitivity as measured by MATSUDA was negatively correlated with liver stiffness ( $r=-0.65$ ;  $p<0.05$ ). Postprandial free fatty acids (FFA) and insulin concentrations during the OGTT were positively associated with liver stiffness ( $r=0.55$ ;  $r=0.65$ ;  $p<0.03$ ) whereas glycemic measures (HbA1c, basal or post-OGTT glucose values) did not.

**Conclusions** We found a positive association of liver stiffness with PDE/ATP ratio. These phospholipid metabolites were

previously identified as a marker of hepatic endoplasmic reticulum stress and increased membrane catabolism. Furthermore, liver stiffness appears more related to postprandial insulin sensitivity and FFA concentrations than fasting glucose and lipid concentrations, pointing to post-prandial lipid metabolism as a key factor in inflammation/fibrosis.

## 22 OBESE ADOLESCENTS WITH POLYCYSTIC OVARY SYNDROME HAVE DECREASED DIVERSITY AND RELATIVE ABUNDANCE IN THE GASTROINTESTINAL MICROBIOTA

B Jobira\*, D Frank, M Kelsey, D Ir, C Robertson, H Rahat, Y Garcia-Reyes, KJ Nadeau, M Green. University of Colorado, Aurora, CO

10.1136/jim-2017-000663.22

**Purpose of study** PCOS is common and associated with the metabolic syndrome. Early evidence in adult women with PCOS suggests that metabolic deterioration may be related to alterations in the gut microbiota. However, this has not been studied in youth, nor in NIH-defined PCOS.

**Methods used** Obese youth, 16 with PCOS (PCOS:  $15.9\pm0.5$  years, BMI 97.8%ile) and 5 obese youth without PCOS (OB:  $15.6\pm0.7$ , BMI 97.6%ile) were enrolled. Participants underwent stool collection, fasting labs, oral glucose tolerance test, DXA scan, activity questionnaire, 7 day accelerometer use, and dietary intake questionnaire. The V3-V4 region of the bacterial 16S rRNA gene was amplified by PCR and bacterial Operational Taxonomic Units were generated using phylogenetic sequence analysis. Comparisons of relative abundance (RA) across groups were conducted by Wilcoxon rank sum tests and alpha diversity within groups was performed by Shannon diversity.

**Summary of results** Girls with PCOS tended to have a worse metabolic profile including HOMA-IR, presence of pre-diabetes, fasting triglycerides and alanine transferase. Diet and activity were similar between groups. Girls with PCOS had decreased RA of *Christensenellaceae* at the family level, phylum *Firmicutes* (PCOS: 0.30% of sequences; OB: 1.68%,  $p$ -value=0.043), and decreased RA in *Lachnospira* at the genus level, phylum *Firmicutes* (PCOS: 0.015%; OB: 0.17%,  $p$ -value=0.043). No difference was observed at the phylum level between the two groups. PCOS had decreased alpha diversity, Shannon E (PCOS:  $3.85\pm0.09$ ; OB:  $4.16\pm0.09$ ,  $p$ -value=0.034). *Christensenellaceae*, *Lachnospira*, and *Clostridium* predicted PCOS disease status and were significantly correlated with biological markers of PCOS (free testosterone,  $R=-0.46$ ,  $p=0.43$ ;  $R=0.67$ ,  $p=0.001$ ; and  $R=-0.44$ ,  $p=0.052$ ).

**Conclusions** Our results suggest that alteration in the gut microbiota relate to PCOS and decreased RA in *Christensenellaceae* and *Lachnospira* are associated with PCOS and metabolic disease.

## 23 THE BRANCHED-CHAIN AMINO ACID VALINE IS HIGHER AND RELATES TO INSULIN SENSITIVITY IN POLYCYSTIC OVARY SYNDROME

H Rahat\*, Y Garcia-Reyes, L Pyle, KJ Nadeau, M Green. University of Colorado Anschutz Medical Campus and Children's Hospital Colorado, Aurora, CO

10.1136/jim-2017-000663.23

**Purpose of study** Polycystic Ovarian Syndrome (PCOS) affects 6%–10% of women and is associated with the metabolic syndrome, specifically insulin resistance (IR). The mechanism of IR in PCOS is unclear, likely multifactorial, and may relate to branched-chain amino acids (BCAA): valine, isoleucine, and leucine. We quantitated the differences in BCAA fasting and in response to hyperinsulinemia in obese youth with and without PCOS, and assessed the relationship to IR.

**Methods used** Obese girls with PCOS [n=15, age  $14.5 \pm 1.6$  years, BMI percentile  $98.5 \pm 1.0$ ] and obese girls without PCOS [n=6; age  $13.2 \pm 1.2$  years, BMI percentile  $98.0 \pm 1.1$ ] were studied. Insulin sensitivity was assessed with a hyperinsulinemic-euglycemic clamp and a 2 hour 75 g oral glucose tolerance test (OGTT). Baseline biochemical measurements including haemoglobin A1c (HbA1c), complete blood count (CBC), liver function, lipid and testosterone panel were also obtained. Nontargeted metabolomics were performed in samples obtained before and after the OGTT and the clamp. Group comparisons were done with t-tests and Spearman's correlations.

**Summary of results** Both groups had similar demographic and physical attributes including age, BMI percentile, age of menarche, habitual physical activity, and diet. Girls with and without PCOS had similar baseline labs including HbA1c, CBC, liver function and lipid panel, apart from elevations of testosterone and anti-mullerian hormone in the PCOS group, as expected. Girls with PCOS had higher fasting valine ( $2.1 \times 10^6 \pm 2.5 \times 10^5$  relative abundance controls vs  $3.0 \times 10^6 \pm 5.0 \times 10^5$  PCOS;  $p=0.003$ ) and following both the OGTT ( $1.9 \times 10^6 \pm 5.1 \times 10^5$  vs  $2.4 \times 10^6 \pm 3.9 \times 10^5$ ;  $p=0.033$ ) and the clamp ( $1.8 \times 10^6 \pm 3.6 \times 10^5$  vs  $2.2 \times 10^6 \pm 2.2 \times 10^5$ ;  $p=0.007$ ). End clamp and OGTT valine significantly correlated with clamp assessed IR ( $r=-0.59$ ,  $p=0.006$ , and  $r=-0.50$ ,  $p=0.045$ , respectively).

**Conclusions** Obese girls with PCOS have elevated BCAA, specifically valine, fasted and in response to hyperinsulinemia, which relates to IR. Further work is needed to determine if BCAA are a modifiable target to improve insulin sensitivity or simply a useful biomarker.

## 24 ETIOLOGY OF NON-LOCALISING SESTAMIBI SCANS IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM

<sup>1</sup>E Frank\*, <sup>1</sup>L Kore, <sup>2</sup>J Park, <sup>2</sup>C Vuong, <sup>2</sup>P DeAndrade, <sup>2</sup>A Simental. <sup>1</sup>Loma Linda University School of Medicine, Loma Linda, CA; <sup>2</sup>Loma Linda University Department of Otolaryngology, Loma Linda, CA

10.1136/jim-2017-000663.24

**Purpose of study** The pathological and surgical findings in cases of non-localising pre-operative imaging in patients with primary hyperparathyroidism remains poorly defined with conflicting reports in the literature. Some have reported non-localization to be associated with greater rate of multi-glandular disease,<sup>1</sup> while others have reported finding predominantly adenoma.<sup>2,3</sup> The objective of this study was to better define the differences in pathological findings for patients presenting with primary hyperparathyroidism having non-localising versus localising pre-operative sestamibi scans.

**Methods used** Three-hundred and thirty-four patients who underwent Tc-99 sestamibi nuclear imaging for pre-operative workup of primary hyperparathyroidism. Patients with non-localising imaging (n=93) had bilateral neck exploration, while patients with localised disease (n=241) had minimally-invasive parathyroidectomy.

**Summary of results** Significant differences were seen in the rates of adenoma, hyperplasia, and pathologically indeterminate parathyroid glands between patients with localising and non-localising pre-operative imaging. There was no significant difference in the rate of double adenoma between groups. Single adenoma remained the most common aetiology for hyperparathyroidism in patients with non-localising imaging.

**Conclusions** Most non-localising sestamibi scans are due to parathyroid adenoma. However, hyperplasia is significantly more prevalent in patients with non-localising (17.2%) versus localising (9.2%) scans, highlighting the necessity for more thorough neck exploration in these patients.

Abstract 24 Table 1

	Non-localising (n=93)	Localising (n=241)	P-value
Adenoma	75.3%	89.2%	<0.01*
Double	2.1%	0.8%	0.32
Adenoma			
Hyperplasia	17.2%	9.2%	<0.05*
Nonspecific	5.4%	0.8%	<0.01*
Enlarged			
Gland			

## REFERENCES

- Sebag F, et al. *Surgery* 2003;**134**(6):1038–1042.
- Chan RK, et al. *Arch Surg* 2008;**143**(4):335–337.
- Hoda NE, et al. *J Miss State Med Assoc* 2013;**54**(2):36–41.

25

## MITIGATION OF CARCINOID SYNDROME SYMPTOMS BY HEPATIC ARTERIAL EMBOLIZATION IN PATIENTS WITH FAMILIAL, METASTATIC CARCINOID TUMOUR, RATIONALE FOR PREVENTIVE MEASURES TO AVERT CARCINOID CRISIS

<sup>1,2</sup>ZP Ortegon\*, <sup>2</sup>J Funderburk, <sup>1,2</sup>L Aguirre, <sup>1,2</sup>RI Dorin. <sup>1</sup>UNM, Albuquerque, NM; <sup>2</sup>New Mexico VA Health Care System, Albuquerque, NM

10.1136/jim-2017-000663.25

**Case report** The patient is 70-year-old white G0P0 female with a history of familial carcinoid tumours who was diagnosed with metastatic mid-gut carcinoid tumour causing fatigue, flushing, and abdominal pain with markedly increased 24 hour urine 5-hydroxyindolacetic acid (5-HIAA) and serum chromogranin A levels. Pathology results from primary surgical resection identified well differentiated neuroendocrine tumour of the terminal ileum/cecum with metastatic involvement of duodenum, mesentery, and liver. Tricuspid valve thickening and tricuspid regurgitation was demonstrated on cardiac echo, and post-operative management was with somatostatin receptor agonist.

Progressive symptoms of carcinoid syndrome and 5-HIAA elevation with radiological evidence of growth of hepatic and abdominal wall metastases led to several TAE interventions that were complicated by flushing, QT prolongation, nausea, malaise, and hypertension. In an effort to avoid observed complications suggestive of carcinoid crisis, subsequent TAE procedure utilised aggressive preventive therapy including pre-treatment with octreotide drip, anti-histamine, and concomitant nitroglycerin drip for management of hypertension. TAE

was accomplished without evidence of carcinoid crisis and associated with marked improvement in carcinoid symptoms.

**Conclusions** TAE is useful in symptom reduction in patients with hepatic metastases from carcinoid tumour. Octreotide infusion may be useful in prevention of carcinoid crisis and reduction in procedure related length of stay. The case also highlights the existence of a rare familial clustering of carcinoid tumours that appears to have autosomal dominant inheritance and is clinically and genetically distinct from multiple endocrine neoplasia 1.

## REFERENCES

1. Liu EH, et al. AACE/ACE disease state clinical review: Diagnosis and management of midgut carcinoids. *Endocr Pract* 2015 May;21(5):534–545. doi:10.4158/EP14464.DSC
2. Rachel PR, et al. Regractory carcinoid syndrome: A review of treatment options. *Therapeutic Advances in Medical Oncology* 2017;9(2):127–137.

## Health care research I

### Concurrent session

12:45 PM

Thursday, January 25, 2018

26

#### ISSUES IN PAEDIATRIC AND NEONATAL RESUSCITATIONS IN A TEACHING HOSPITAL IN BUTARE, RWANDA

<sup>1,2</sup>LA Hall\*, <sup>2</sup>E Ahorugereye, <sup>2</sup>A Nyalihamu, <sup>2</sup>C Twagirayezu, <sup>1,3</sup>B Fassl. <sup>1</sup>University of Utah, Salt Lake City, UT; <sup>2</sup>University Teaching Hospital of Butare, Butare, Rwanda; <sup>3</sup>Primary Children's Hospital, Salt Lake City, UT

10.1136/jim-2017-000663.26

**Purpose of study** Simulation has shown to be an effective method for training skills and improving teamwork. Paediatric resuscitations in resource-limited settings are met with many challenges including lack of necessary supplies, an inefficient health system, and a lack of interdisciplinary training. The purpose of this study is to highlight some of the issues in paediatric and neonatal resuscitations at a referral hospital in Butare, Rwanda in order that steps can be made to improve outcomes.

**Methods used** Using a Likert scale for answers, we administered a survey to all paediatric nursing staff, medical students, residents, and paediatricians at a teaching hospital in Butare, Rwanda to determine provider perception of key issues and challenges faced in the paediatric and neonatal wards during resuscitations. The survey questions were focused on evidence based key interventions during resuscitations. Reporting is descriptive.

**Summary of results** Twenty-three participants completed the survey. 20 out of 23 of the participants felt that the hospital was not sufficiently prepared for paediatric resuscitations. The majority of participants (19/23) reported locating medication and equipment as the biggest challenge during a resuscitation. Almost all participants (22/23) answered 'always', 'frequently', or 'sometimes' when asked how often they felt that a death or poor outcome could have been prevented in a resuscitation if equipment had arrived faster and if medications were more

available. 18 out of 23 reported staff shortages especially at night and weekends as a priority issue. Many of the participants reported that resuscitations were without a clear leader, had poor communication, and that lack of training was a major factor in poor outcomes.

**Conclusions** The survey identified a need for further training in resuscitation skills, teamwork and communication involving a multidisciplinary team. It also revealed a lack of equipment/medications and poor staffing as being a major systems issue that may be contributing to poor outcomes in resuscitations.

27

#### EMERGENCY DEPARTMENT PHYSICIANS' RECOMMENDATIONS FOR QUALITY IMPROVEMENT ON A PAEDIATRIC TELE-EMERGENCY PROGRAM

A Lloyd\*, JL Kissee, D Tancredi, B Yoo, N Kuppermann, JP Marcin. UC Davis, Sacramento, CA

10.1136/jim-2017-000663.27

**Purpose of study** Telemedicine is increasingly used, however, little is known about when telemedicine is most effective and how physicians' perceive the user experience and clinical impact. The UC Davis Children's Hospital is conducting a multi-centre randomised controlled trial to determine the impact of paediatric tele-emergency consultations provided to 15 rural EDs. As part of this study, we sought to measure the ED physicians' opinions on using tele-emergency medicine for critically ill children.

**Methods used** We conducted a systematic literature review on the use of paediatric tele-ED consultations and assessment tools used to evaluate telemedicine. Based on this information and potential knowledge gaps, we created a survey to assess ED physicians' opinions on various aspects of tele-emergency medicine. The survey consisted of 27 questions: 17 based on a 7-point likert scale, and 10 open-ended and closed-ended. We sent the electronic survey to the 15 spoke hospital ED physician directors and 12 hospitals responded. Data was collected over a 3 week period in September 2017.

**Summary of results** The most common barriers affecting telemedicine activation are limited time (30%), adoption of new technology in the existing workflow (25%) and the feeling that it is not always clinically necessary (25%). When asked about the positives of telemedicine, the majority felt that telemedicine helps with the clinical management of patients (52%) and that the patients/families like telemedicine (30%). With regards to the negatives of telemedicine, 50% of ED directors felt telemedicine is not always clinically necessary and 25% commented that it was time consuming. In open ended questions, telemedicine was frequently noted to be most effective for respiratory issues, neonatal care, and more urgent cases, and least effective for stable patients and those being transferred for specialty care.

**Conclusions** These findings provide evidence that ED physicians believe that telemedicine helps in the clinical management of patients, most frequently among children with respiratory, congenital and cardiovascular processes. However, physicians do not consistently believe that telemedicine is clinically necessary for all cases, and least helpful among patients with non-acute/general paediatric processes.



28

### QI PROJECT TO REDUCE TIME TO ANTIBIOTIC ADMINISTRATION IN FEBRILE CHILDREN WITH MALIGNANCY

<sup>1</sup>RD Fisher\*, <sup>1</sup>S Bhoopalan, <sup>2</sup>K Ayyanar, <sup>3</sup>T Vergara. <sup>1</sup>University of Nevada Las Vegas, Las Vegas, NV; <sup>2</sup>Children's Specialty Centre, Las Vegas, NV; <sup>3</sup>Sunrise Hospital, Las Vegas, NV

10.1136/jim-2017-000663.28

**Purpose of study** Neutropenia is a common finding in children who undergo chemotherapy. Fever is usually the only presenting sign of a serious bacterial infection in these patients. Our quality improvement project aims to identify these patients and further to reduce the time taken to administer antibiotics. Chemotherapy-induced neutropenia is typically prolonged due to bone marrow insult, increasing the risk of serious bacterial infection. Although studies have not yet clearly demonstrated a link between early administration of antibiotics and prevention of sepsis in these patients, the national standard is to administer antibiotics in less than 60 min.

#### Objective

- To identify the time taken for antibiotic administration in children with malignancy who present with fever to the paediatric emergency room at Sunrise Children's Hospital, Las Vegas.
- Identify steps involved from triage of patient to administration of antibiotic, and measure the time taken for each individual step.
- Implement measures to reduce the time for antibiotic administration to less than 60 min, using PDSA cycle technique.
- Sustain the results, and re-evaluate for next cycle of PDSA cycle.

**Methods used** We employed the Plan-Do-Study-Act (PDSA) method. Initial planning showed the potential bottlenecks such as rooming and ordering of antibiotics. We developed a new protocol for these patients based on a risk-stratification system. We hypothesised that the new clinical protocol would reduce the time for ordering antibiotics for our patients. Data were continually collected during the study period to monitor time taken for antibiotic administration.

**Summary of results** Our initial analysis shows that we reduced the time for antibiotic administration from an average of 120 min to a little over 90 min. We identified that majority of time taken was from triage to ordering antibiotics, and from ordering of antibiotics to delivery of antibiotics by pharmacy.

**Conclusions** Future directions: We are currently creating a code team for febrile children with malignancy, wherein there will be a special pager connecting the paediatric emergency room to the pharmacy to reduce the time taken for delivering antibiotics for our study population.

29

### EMERGENCY SURGERY DELAYS—AN ANALYSIS OF TARGET TIME ACHIEVEMENT AND CAUSES OF DELAY IN EMERGENCY CASES AT BC CHILDREN'S HOSPITAL

<sup>1</sup>T Dasgupta\*, <sup>1</sup>N Cheung, <sup>1</sup>B Fashola, <sup>1</sup>D Duffy, <sup>2</sup>S Butterworth. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>BC Children's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.29

**Purpose of study** Many patients across Canada continue to experience delays in surgical wait times. Concerns have been

raised that patients requiring emergency surgeries, when delayed, may have an increased risk of morbidity or mortality.

The purpose of this study was to analyse the occurrence and patterns of delays of emergency surgery as well as the relationship between surgical delay and risk adjusted outcomes. The causes of delay were also sought.

**Methods used** In a prospective study, four classes of emergent surgeries were evaluated: Class 1 (target <1 hour), 2 A (<6 hours), 2B (<24 hours) and 3 (<72 hours). Data was collected for three months (May 21st–August 21st). Prospective Operating Room databases as well as patient charts were reviewed to determine the amount of delay (time and frequency), causes of surgical delays, morbidity and mortality. Patients were categorised as high or low risk of mortality based on validated scoring systems (SNAPP-II for neonates and PRISM for infants and children).

**Summary of results** During the study, there were a total of 342 cases out of which 8.2% were excluded due to incomplete data. In 314 cases analysed, 43.5% of Class 1, 10.6% of Class 2 A, 11.5% of Class 2B and 12.8% of Class 3 cases were delayed beyond their target time. The most common reason for delay as reported by the surgeons was lack of available OR facilities. Mean times from surgery booking to OR entry were 67 mins, 4.9 hour, 14.3 hour and 38.9 hour for Class 1, 2 A, 2B and 3 respectively. An increase in target time achievement was observed during the course of this project, most likely due to the Hawthorne Effect, as no new policies had been implemented. No correlation between morbidity and surgical delay was found. 42.4% of all surgeries occurred out of regular hospital hours, with 15.7% patients developing complications, however, statistical significance was not reached.

**Conclusions** The sickest children needing the most urgent surgeries (Class 1) are most likely to be delayed, often due to limited resources, whereas the majority of less urgent surgeries were completed well within their target times. Increased collaboration in the surgical team is required to improve timely access to clinical care.

30

### IMPLEMENTATION OF AN INTUBATION REGISTRY WITHIN A CANADIAN TERTIARY-CARE HOSPITAL

C Liu\*, J Yoo, J Trojanowski, K Dullemond, C Renschler, D Griesdale, J Brubacher. UBC, Vancouver, BC, Canada

10.1136/jim-2017-000663.30

**Purpose of study** Endotracheal intubation is a high risk procedure, especially when done emergently outside the operating room (OR). Unfortunately no data on success and complication rates exist for Canadian centres. We describe the implementation of a registry to record all emergent intubations in a level one Canadian Trauma centre. Our long term aims are to determine which factors can be used as predictors for complications, first pass success rate, use of checklists, and a system (e.g., armbands) to alert caregivers for possible difficult intubation.

**Methods used** An airway form was created with staff from Emergency Medicine, Intensive Care (ICU), and Respiratory Therapy (RT). The form captures intubation date, time, location, complications and the number of attempts. As part of hospital protocol, RTs are required to complete the airway form for each emergency in-hospital intubation. Elective



intubations in the OR without transfer to ICU afterwards are excluded. Since July 2016, 966 forms have been collected and data entered into a secured online database. Intubations from May 2016–July 2017 (n=698) were characterised for intubation location, technique, complication and success rates. A subgroup of ED intubations (n=182) were selected for in-depth chart reviewing intubation indications, complications, paralytic and induction agents used, and pre/post intubation vital signs.

**Summary of results** Most intubations occurred in the ED (255/698=36.6%), followed by ICU (143/698=20.5%). First pass success rates were 82.7% in the ED, 77.5% in ICU, and 76.1% in the wards. The five most common indications for ED intubations were seizure (13.5%), spontaneous intracranial haemorrhage/stroke (11.8%), traumatic brain injury (9.6%), sepsis (8.4%), and overdose (8.4%). The top two complications across all locations were hypoxia prior to induction, and desaturation after induction. The mean age for patients was 58.5 years with 64.9% male.

**Conclusions** The airway registry is a valuable quality improvement tool that allows comparison of intubation performance on different hospital wards and evaluation of future interventions. Long term data collection will allow us to compare intubation performance across centres in BC.

### 31 DELAYS IN CYSTECTOMY FOR PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER

A Chu\*, S Holt, J Gore. *University of Washington, Seattle, WA*

10.1136/jim-2017-000663.31

**Purpose of study** The standard treatment for muscle-invasive bladder cancer is radical cystectomy (RC). Prior studies demonstrated that delays from diagnosis to surgery greater than 12 weeks result in higher mortality, higher pathological tumour stage, and worse progression-free survival. We sought to validate adverse outcomes associated with delays in care in the current treatment paradigm that includes neoadjuvant chemotherapy (NAC) and identify patient, provider, and health systems characteristics that correlate with a delay of treatment.

**Methods used** Subjects were identified from the Surveillance, Epidemiology, and End Results (SEER) national cancer registry linked with Medicare claims. All patients with American Joint Committee on Cancer stage II (T2N0-1M0) urothelial cell carcinoma of the urinary bladder who underwent RC from 2004–2011 were stratified into treatment with or without NAC. Variable selection was derived from Andersen's behavioural model of healthcare utilisation and included demographics, medical need, and provider/health system factors. Cox multivariate proportional hazard models were constructed to assess the significance of a delay in care on survival. Multivariate logistic regression was used to identify independent characteristics associated with a delay in care.

**Summary of results** 1641 subjects with stage II bladder cancer underwent RC during the study period. Compared with timely surgery (RC within 12 weeks of diagnosis), a delay in care increased the risk of overall mortality (HR 1.34,  $p=0.02$ ; HR 1.55,  $p=0.045$ , for no NAC and NAC cohorts, respectively). Without NAC, those with a delay in care were more likely to live in a high-poverty neighbourhood ( $p=0.045$ ) or a non-metro area ( $p=0.03$ ), be male ( $p=0.005$ ), and have required a transfer in bladder cancer care ( $p=0.02$ ). These associations

were not observed in the NAC group, who were younger ( $p<0.001$ ) and received care from higher volume RC providers ( $p=0.008$ ).

**Conclusions** Delays in care from diagnosis or NAC to RC are associated with decreased survival among patients with stage II bladder cancer. These delays are associated with male gender, living in a high-poverty neighbourhood or non-metro area, and transfers in care from biopsy to RC in patients without NAC. This was not observed in patients with NAC as they may represent a subset of bladder cancer patients who are effective healthcare users.

### 32 LOWERING BARRIERS TO ENGAGEMENT IN A PRIMARY CARE-BASED BUPRENORPHINE TREATMENT PROGRAM

<sup>1</sup>BE Payne\*, <sup>1,2,3</sup>JW Klein, <sup>1</sup>CB Simon, <sup>1,2,3</sup>JR James, <sup>1,2,3</sup>SL Jackson, <sup>1,2,3</sup>JO Merrill, <sup>1,2,3</sup>Jl Tsui. <sup>1</sup>University of Washington School of Medicine, Seattle, WA; <sup>2</sup>University of Washington, Seattle, WA; <sup>3</sup>Harborview Medical Centre, Seattle, WA

10.1136/jim-2017-000663.32

**Purpose of study** Buprenorphine is an evidence-based treatment for opioid use disorder, and can be prescribed in a standard primary care setting. Scant research has examined the process of engagement prior to buprenorphine initiation. To engage more patients, our program implemented lower treatment barriers, most notably by eliminating a requirement that patients demonstrate abstinence from stimulants before receiving buprenorphine. Here, we examine the effects of these lower-barrier conditions on initiation and retention of patients in treatment.

**Methods used** In our program, patients complete an intake screening before nurse and physician visits leading to buprenorphine initiation. We extracted demographic and clinical data from electronic medical records and a program participant log. Stratifying by recent use of stimulants (cocaine and/or amphetamines) and controlling for important covariates, we compared outcomes between patients screened before and after implementation of lower-barrier conditions. Multivariate logistic regression and Cox Proportional Hazards analyses were employed to compare odds of buprenorphine initiation and hazards of drop-out/non-retention after initiation.

**Summary of results** Among patients with recent stimulant use, post-implementation conditions were associated with higher relative odds of buprenorphine initiation within 90 days of screening (aOR=6.54, 95% CI: 2.19 to 19.53), but also with higher relative hazards of subsequent drop-out/non-retention (aHR=5.74, 95% CI: 1.49 to 22.13).

**Conclusions** Our results indicate that enacting lower-barrier policies in primary care-based buprenorphine treatment may allow engagement of more patients, but that these newly eligible patients may be more vulnerable to treatment failure than those who are able to overcome higher treatment barriers. Further research is needed to identify interventions that improve treatment success after engagement among patients who concurrently use stimulants with opioids.

### 33 RISK-STRATIFICATION TO PRIORITISE DIABETES RETINAL SCREENING: AN ALGORITHMIC APPROACH

<sup>1</sup>C Mehranbod, <sup>1</sup>L Serpas, <sup>1</sup>P Genter, <sup>1</sup>Y Lu, <sup>1,2</sup>E Ipp\*. <sup>1</sup>Los Angeles Biomedical Research Institute, Torrance, CA; <sup>2</sup>Harbor-UCLA Medical Centre, Torrance, CA

10.1136/jim-2017-000663.33

**Purpose of study** Routine screening for diabetic retinopathy (DR) is an essential part of secondary prevention in people with diabetes (DM). This enables early detection and treatment of sight-threatening DR (STDR) to prevent visual loss. Yet DM is the single most common cause of blindness in the working-age population—due in large part to low DR screening rates, especially in low-income, minority populations. We aimed to develop and validate a risk-stratification algorithm (RSA) to prioritise patients for DR screening based on risk for STDR.

**Methods used** An algorithm was developed with patient registry data in Clinic 1, and used to predict STDR risk using data from Clinic 2. Both clinics serve primarily low income Latino and African American patients. In Clinic 1, we used readily available clinical data (age, sex, albumin-creatinine ratio, A1C, insulin use status) to develop the RSA.

**Summary of results** Prevalence of risk factors for DR was similar in the 2 clinics. Microalbuminuria (24%–28%) and A1C were similarly distributed ( $p=NS$ ), but in Clinic 1 patients were younger (mean 53 vs 57 y) and fewer used insulin (15 vs 22%) ( $p<0.05$ ). The RSA used data from 752 DM patients in clinic 1, who underwent routine DR Screening (% STDR=13.9). Area under the ROC curve was 79.8%, sensitivity 69.2%, specificity 79.0%. We applied the RSA to two retrospective validation cohorts in Clinic 2 to determine its effectiveness to identify patients at risk for STDR. Cohort A included 585 DM patients who had undergone routine tele-retinal DR Screening. STDR was found in 55 patients (9.4%); and most ranked high risk by the RSA. By applying the RSA, 76.4% of the patients with STDR would have been identified before the program completed screened half of all patients. In Cohort B, there were 105 patients with STDR (8.9% of 1,178). Of these, 88.6% ( $n=93$ ) would have been similarly identified by the RSA.

**Conclusions** To our knowledge this is the first RSA developed specifically for a low-resource, safety net population. The data suggest that using simple and routinely obtained demographic and lab data, it is possible to predict likelihood of identifying STDR. We conclude that a simple risk-stratification algorithm can be used to prioritise patients for early DR screening in low-income, minority patients.

34

#### DYSPHAGIA IN HOSPITALISED ELDERLY ADULTS

<sup>1</sup>A Cragoe\*, <sup>2</sup>P Krishna, <sup>2</sup>B Crawley. <sup>1</sup>Loma Linda University School of Medicine, Redlands, CA; <sup>2</sup>Loma Linda University Voice and Swallowing Centre, Redlands, CA

10.1136/jim-2017-000663.34

**Purpose of study** Dysphagia is an important problem for elderly adults causing social isolation, weight loss, malnutrition and dehydration, inability to take medications, and pneumonia. It is unknown how hospitalisation affects the development and progression of dysphagia in this population. This study was undertaken to investigate the prevalence of dysphagia in elderly hospitalised adults, the diagnoses commonly associated with dysphagia, treatment offered and progression.

**Methods used** This retrospective review encompassed the charts of one hundred consecutive patients over 64 admitted to a tertiary referral hospital in January 2017. The only cases excluded were those of patients admitted for less than four days or those with known dysphagia related to oral and pharyngeal complications of head and neck or oral cancer or

surgery. Data extracted included demographic information, admitting diagnosis, admitting team, length of stay, speech language pathology (SLP) and dietary evaluations, premorbid diet, BMI, and malnutrition status. Treatment for dysphagia and discharge diet were also examined.

**Summary of results** 46 males and 54 females (average age 76) were included in this review. Of 81 patients with available admission information, dysphagia was noted in 19%. Premorbid diet was recorded for 20 patients. Admission diets were regular in 43, NPO in 52, and dysphagia special diet in 5. 30 had naso- or orogastric tubes placed during admission. 83 patients were seen by nutrition services. 57 were diagnosed with at least moderate malnutrition. Of these, 22 received SLP services. 29 swallow studies were performed and dysphagia was diagnosed in 19. 26% of these were admitted with a neurologic diagnosis. 20 patients were placed on a special dysphagia diet during their stay. 25 received swallowing therapy in the hospital. Of those, 6 were discharged on a special dysphagia diet. No patients had scheduled swallow therapy at discharge.

**Conclusions** Dysphagia screening was not routinely performed in elderly patients upon admission to the hospital. Dysphagia was not routinely addressed in the setting of malnutrition. Patients were not discharged with an explicit plan for swallowing follow-up despite swallow therapy in the hospital, NPO status, or malnutrition. Dysphagia is prevalent and problematic in hospitalised elderly patients.

## Immunology and rheumatology I

### Concurrent session

12:45 PM

Thursday, January 25, 2018

35

#### SYSTEMIC SCLEROSIS AND REPRODUCTIVE HISTORY

<sup>1</sup>TL Eisenbach\*, <sup>2</sup>SB Kanaan, <sup>3</sup>TD Pan, <sup>2</sup>JA Allen, <sup>4</sup>MD Mayes, <sup>2,3</sup>JL Nelson. <sup>1</sup>University of Washington School of Medicine, Bellevue, WA; <sup>2</sup>Fred Hutchinson Cancer Research Centre, Seattle, WA; <sup>3</sup>University of Washington, Seattle, WA; <sup>4</sup>University of Texas Health Science Centre at Houston, Houston, TX

10.1136/jim-2017-000663.35

**Purpose of study** Parity affects risk of some autoimmune diseases. Since parity could also affect clinical features, we investigated clinical aspects of systemic sclerosis (SSc) in women according to parity (nulliparous vs parous). Because women harbour cells from pregnancy decades later, we also asked whether the HLA genotype of children born before onset was associated with SSc development in parous women.

**Methods used** Women with SSc were recruited from Washington and surrounding states with some also identified through a national SSc registry. 213 women were evaluated for clinical aspects of SSc according to parity status: 111 parous and 102 nulliparous. HLA-genotyping was conducted from blood or buccal samples using standard methods for parous SSc women and all children born prior to disease onset. Healthy women recruited from Washington State and their children were HLA-genotyped. Analysis was conducted for SSc-associated HLA risk and protective alleles of children comparing women with SSc to healthy women for Caucasians, 93 and 236

respectively. Mantel-Haenszel stratified categorical analysis was the primary statistical method used.

**Summary of results** Parous women had a later age of SSc onset compared to nulliparous women (median=42 years vs 31 years respectively). The time since last birth was shorter for women with diffuse SSc than limited SSc (an average of 13.6 vs 19.6 years,  $p=0.03$ ). History of an abortion prior to SSc onset was associated with diffuse disease ( $p<0.001$ ). Parity was not associated with other clinical variables evaluated, including autoantibodies. The mother's SSc status was not associated with SSc risk or protective alleles in children born prior to SSc onset (paternally-transmitted).

**Conclusions** Clinical aspects of SSc in women differ according to parity and gravidity status. Shorter time from last birth and history of abortion was associated with diffuse disease. The presence of SSc risk or protective alleles in children does not appear to affect disease risk for the mother.

### 36 ESTABLISHMENT OF NORMAL CYTOKINE REFERENCE INTERVALS IN CEREBRAL SPINAL FLUID FOR POTENTIAL BIOMARKER DISCOVERY IN NEUROINFLAMMATORY DISORDERS

<sup>1,2</sup>TB Martins\*, <sup>1</sup>B Pasi, <sup>1,2</sup>LK Peterson, <sup>1,2</sup>HR Hill. <sup>1</sup>ARUP Institute, Salt Lake City, UT; <sup>2</sup>University of Utah School of Medicine, Salt Lake City, UT

10.1136/jim-2017-000663.36

**Purpose of study** To determine normal reference intervals for multiple cytokines and markers in cerebral spinal fluid (CSF). CSF is a critical body fluid in which to attempt to discover potential biomarkers for neuroinflammatory and autoimmune disorders of the brain as well as evidence of traumatic brain injury. Cytokines produced by macrophage like astroglial cells, T helper (Th)1 cells and Th2 cells play key roles in the inflammatory and regulatory processes of infection and wound healing, making them potential biomarkers for many neuroinflammatory disorders.

**Methods used** A laboratory developed multiplexed cytokine assay measuring 13 cytokines was used to establish reference intervals in thirty CSF samples from normal donors. Reference intervals were then used to evaluate cytokine concentrations in 79 CSF samples submitted for PCR HSV encephalitis and 55 for neuronal-specific enolase (NSE) testing.

**Summary of results** Reference intervals established from 30 normal CSF donors (18 Male, 12 Female, mean age 37.1 y) were as follows:

Th1 (pg/ml); IL-2<2, IL-2r<93, IL-12<2, IFN- $\gamma$ <2.

Th2 (pg/ml); IL-4 <2, IL-5 <2, IL-10 <2, IL-13 <2.

Monokines (pg/ml); IL-1 $\beta$ <2, IL-6 <39, IL-8 12-283, TNF- $\alpha$ <2.

CSF samples submitted for HSV testing had significantly elevated values for IL-2r (48 vs 16 pg/ml,  $p=0.01$ ), IL-6 (220 vs 3 pg/ml,  $p=0.03$ ) and IL-10 (3 vs 0 pg/ml,  $p=0.04$ ) compared to normal reference intervals. Those submitted for NSE testing, a marker of brain anoxia, had significantly elevated values for IL-6 (66 vs 3 pg/ml,  $p=0.05$ ) when compared to the normal reference intervals. Additional studies are underway to examine CSF from patients with multiple sclerosis.

**Conclusions** Cytokine concentrations in CSF from normal donors was less than the limit of detection of our assay (2 pg/ml) for 10 of the 13 measured cytokines. Elevated cytokine concentrations were observed in patient CSF samples submitted for HSV and NSE testing. By establishing normal reference intervals for cytokine concentrations in CSF, potential biomarkers for neuroinflammatory disorders and traumatic brain injuries can be more appropriately investigated.

### 37 BMI AND PERSISTENCE OF CONVENTIONAL DMARDS & TNF INHIBITORS IN RHEUMATOID ARTHRITIS

<sup>1</sup>CB McCulley\*, <sup>1</sup>J Barton, <sup>2</sup>G Cannon, <sup>2</sup>B Sauer, <sup>2</sup>C Teng, <sup>3</sup>L Caplan, <sup>4</sup>B England, <sup>4</sup>T Mikuls, <sup>5</sup>J Baker. <sup>1</sup>Oregon Health and Science University, Portland, OR; <sup>2</sup>University of Utah, Salt Lake City, UT; <sup>3</sup>University of Colorado, Denver, CO; <sup>4</sup>University of Nebraska, Omaha, NE; <sup>5</sup>University of Pennsylvania, Philadelphia, PA

10.1136/jim-2017-000663.37

**Abstract 37 Table 1** Associations between BMI category and earlier drug discontinuation

Unadjusted Models				
	Methotrexate N=15,082	TNFi N=8,412	Prednisone N=11,627	HCQ N=7,490
	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>BMI Category</b>				
<20 kg/m <sup>2</sup>	1.18 (1.07, 1.31)***	1.15 (0.99, 1.34)	0.93 (0.83, 1.03)	1.13 (0.97, 1.31)
20-25 kg/m <sup>2</sup>	1.03 (0.99, 1.08)	1.13 (1.06, 1.20) ***	0.93 (0.88, 0.97) **	1.10 (1.04, 1.18) **
25-30 kg/m <sup>2</sup>	1 (reference)	1 (reference)	1 (reference)	1 (reference)
30-35 kg/m <sup>2</sup>	1.03 (0.99, 1.08)	1.04 (0.99, 1.10)	1.05 (1.00, 1.10) *	0.98 (0.92, 1.04)
≥35 kg/m <sup>2</sup>	1.08 (1.09, 1.14) ***	1.11 (1.04, 1.18) ***	1.17 (1.11, 1.23) ***	0.97 (0.91, 1.04)
<b>Fully Adjusted Models†</b>				
	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
<b>BMI Category</b>				
<20 kg/m <sup>2</sup>	1.17 (1.04, 1.29) **	1.16 (1.00, 1.36)	0.97 (0.87, 1.09)	1.10 (0.94, 1.28)
20-25 kg/m <sup>2</sup>	1.05 (1.00, 1.10) *	1.12 (1.05, 1.20) ***	0.94 (0.90, 0.99) *	1.09 (1.02, 1.16) **
25-30 kg/m <sup>2</sup>	1 (reference)	1 (reference)	1 (reference)	1 (reference)
30-35 kg/m <sup>2</sup>	1.01 (0.97, 1.05)	1.02 (0.97, 1.08)	1.03 (0.98, 1.08)	0.97 (0.91, 1.03)
≥35 kg/m <sup>2</sup>	1.02 (0.97, 1.08)	1.04 (0.98, 1.11)	1.11 (1.05, 1.18) ***	0.96 (0.89, 1.03)

\* $p<0.05$ ; \*\* $p<0.01$ ; \*\*\* $p<0.001$

† Adjusted for: calendar date, age, sex, black race, concurrent medication use, RDCI, CRP, ever CCP positive, disease duration >5 years, diabetes, HTN, CHF, cancer, anxiety, depression, current smoking. For TNFi: also adjusted for first biologic use and therapy.



**Purpose of study** Low BMI is associated with more destructive disease in rheumatoid arthritis but obese patients may be more likely to discontinue therapy, suggesting a refractory phenotype. The purpose of this study was to examine the association between BMI and DMARD persistence, accounting for confounding factors.

**Methods used** VA databases were used to define initial courses of methotrexate (MTX), TNF inhibitors, hydroxychloroquine, sulfasalazine, and prednisone. Discontinuation was defined as a lapse in drug refill >90 days. Multivariable Cox proportional hazards models were used to evaluate associations between BMI category and time to DMARD discontinuation before and after adjusting for covariates.

**Summary of results** There were 46 970 unique initial DMARD courses with RA between 2003–2014. Patients with low BMI (<20 kg/m<sup>2</sup>) and normal BMI (20–25 kg/m<sup>2</sup>) were more likely to discontinue MTX, HCQ, and TNFi, compared to other BMI categories. Severe obesity (BMI >35) was not associated with discontinuation of DMARD therapy except for prednisone. Factors associated with earlier MTX and/or TNFi discontinuation included female sex, black race, older age, greater comorbidity, and a history of depression, malignancy, CHF, and active smoking.

**Conclusions** Among US veterans with RA, obesity was not associated with reduced persistence of DMARDs or TNFi after adjustment for confounding. These data are not consistent with the hypothesis that obesity is a biologic mediator of refractory disease. Conversely, low BMI and co-morbid conditions are associated with reduced drug persistence.

### 38 NOVEL RNA END MODIFICATIONS DETECTED BY INNATE IMMUNE SENSORS

R Ancar\*, JR Hesselberth. *University of Colorado School of Medicine, Parker, CO*

10.1136/jim-2017-000663.38

**Purpose of study** Innate immune sensors must respond rapidly to pathogens while avoiding detection of self-molecules. RIG-I-like receptors (RLRs) are cytosolic double-stranded RNA (dsRNA) sensors that bind viral RNAs. RLRs such as retinoic acid inducible gene I (RIG-I) couple detection of viral RNAs to expression of type I interferon. Structural and biochemical studies have identified short viral dsRNAs with 5'-triphosphate ends as RIG-I ligands. The 5'-triphosphate is a unique feature of viral replication enabling specific detection of viral RNAs and discrimination against self-RNAs. Recent studies show that RNA cleavage products of some endoribonucleases can activate a RIG-I-dependent type I interferon response. However, these endoribonucleases produce RNA products with 5'-OH and 2',3'-cyclic phosphate ends, so it is unclear how these RNA cleavage products activate RIG-I. We hypothesise that RNA end modification enzymes remodel the termini of these RNA cleavage products to promote their recognition by RIG-I.

**Methods used** End-modified dsRNA oligonucleotides were transfected into A549 cells. Interferon- $\beta$  (IFN- $\beta$ ) and RNA end modification enzyme mRNA expression induced by the modified oligonucleotides was determined by RT-qPCR and analysed by one-way ANOVA. Northern blotting was used to determine transfection efficacy and decay rates. RIG-I knock-out A549 cells generated by CRISPR/Cas9 technology were used to confirm RIG-I pathway dependence.

**Summary of results** Our preliminary results show that 12 hours after transfection 3'-monophosphate dsRNAs robustly activate IFN- $\beta$  expression and the RNAs are detectable in the cells at this time point. IFN- $\beta$  expression is also dependent on the position of the phosphate at the 3'-end of the RNA. Furthermore, 5'-monophosphates do not activate an IFN- $\beta$  response. IFN- $\beta$  expression induced by 3'-monophosphate dsRNAs is dependent on RIG-I and activates expression of the RNA end modification enzyme 2',3'-cyclic nucleotide phosphodiesterase.

**Conclusions** These studies suggest that RIG-I can detect the 3'-ends of cytosolic RNAs. Moreover, 3'-end modifications generated by host RNA end modification enzymes may modulate detection of intracellular RNA by RIG-I. This has significant implications for our understanding of endogenous RNA detection by innate immune sensors, which are involved in the pathogenesis of many immune disorders.

### 39 ERADICATION OF HEPATITIS C AMONG US VETERANS: EXAMINATION OF CHANGES IN PAIN SEVERITY AND PRESCRIPTION OPIOID USE FOLLOWING TREATMENT

<sup>1,2</sup>AA Kumthekar\*, <sup>2</sup>S Shull, <sup>1,2</sup>T Lovejoy, <sup>1,2</sup>B Morasco, <sup>1,2</sup>M Chang, <sup>1,2</sup>J Barton. <sup>1</sup>Oregon Health and Science University, Portland, OR; <sup>2</sup>VA Portland Health Care System, Portland, OR

10.1136/jim-2017-000663.39

**Purpose of study** The study objective is to assess the impact of Direct Acting Anti-Viral (DAA) treatment on pain and opioid use among patients treated at a single VA medical centre.

**Methods used** Data was obtained from the VA electronic health record through retrospective administrative data abstraction and manual chart review. Inclusion criteria: Veterans with positive HCV antibody or HCV RNA or HCV genotype test or an ICD 9/ICD 10 code for HCV, seen in the rheumatology clinic and treated with DAA without interferon between January 1, 2010 and December 31 st 2016; exclusion criteria: deceased during study period. Data abstracted included HCV status, HCV treatment, numeric rating scale pain scores and opioid dose prescribed. Pain scores were averaged over two 6 month periods: 6 months leading up to HCV treatment and 6 months following completion of treatment. Opioid dose was converted to a morphine equivalent daily dose (MEDD) and averaged across the same two 6 month intervals. Generalised estimating equations were used to model the change in average pain and MEDD from pre- to post-HCV treatment.

**Summary of results** A total of 126 patients completed HCV treatment with DAA, of which 121 (96%) achieved a sustained virologic response (SVR) and were included in the analysis. A majority (93%) were male, with a mean age of 59 ( $\pm$ 5.6) years. Average pre-treatment pain was 4.4 (SD 2.4). Among the 67 patients prescribed opioid therapy, average pre-treatment MEDD was 52.40 mg. Both pain and MEDD decreased following SVR. The effect of time was associated with an average reduction in pain of 0.54 points ( $p=0.02$ , Cohen's  $d=0.16$ ). Of the 67 patients prescribed opioids in the pre-treatment period, average MEDD decreased by 8 mg during the post-treatment period ( $p<0.01$ , Cohen's  $d=0.24$ ), and 67% of patients experienced an opioid dose reduction, with 12 patients discontinuing opioids entirely.

**Conclusions** Among US Veterans with HCV seen in a rheumatology clinic at a single centre, subjective pain scores were reduced post-treatment. In addition, among those prescribed opioids pre-treatment, a majority had a reduction in opioid dose post-treatment.



40

# STEVENS-JOHNSON SYNDROME, CAUSED BY MYCOPLASMA, PRESENTING WITHOUT SKIN INVOLVEMENT

S Bhooapan\*, N Wilson. *University of Nevada School of Medicine, Las Vegas, NV*

10.1136/jim-2017-000663.40

**Purpose of study** *Mycoplasma pneumoniae* is an obligate intracellular bacteria which is typically associated with pulmonary infections. Although *Mycoplasma pneumoniae* is usually self-limited and mild, it has been associated with numerous extrapulmonary manifestations such as maculopapular rashes, hemolytic anaemia, and myocarditis. Rarely it has been known to cause Stevens-Johnson syndrome (SJS) which is considered an autoimmune T-cell mediated condition. While SJS in its classical form causes sloughing lesions in both skin and mucous membrane, we report 3 cases of SJS without any skin involvement.

**Methods used** Chart review and literature review were the primary methods utilised for this abstract.

**Summary of results** We report 3 male patients between ages 12 and 13 years who presented with erythematous painful sores in their mouth. The lesions had an acute onset and have been progressive in nature. While 2 of the patients were from Las Vegas, one was visiting Las Vegas from Turkey. All three reported symptoms of mild upper respiratory infection such as nasal congestion, fatigue and subjective fever but only one of the patients had any recent antibiotic exposure. One of the patient's lesions were severe enough to warrant total parenteral nutrition due to poor oral intake. No skin lesions were noted in any of these patients. All three patients had serological evidence of *M. pneumoniae* infection. The patients were diagnosed with SJS without any skin involvement and two were given a short course of intravenous steroid after which they improved significantly.

**Conclusions** The association between *M. pneumoniae* and SJS has been well established over the years. In addition, there are literature reports of SJS presenting without skin involvement. The question of whether this is a separate entity (Fuchs syndrome) or a forme fruste of SJS has not been convincingly answered yet. We present 3 cases of such presentation associated with serological evidence for *M. pneumoniae* infection in children. Although self-limited in our patients, the severity of the clinical condition and the resultant anxiety to the families makes it important to establish the aetiology in these situations. We conclude that *Mycoplasma* induced SJS may present without the typical skin lesions but mucosal lesions only.

41

# THE ROLE OF INTERFERON IN AUTOIMMUNE-SUSCEPTIBLE RO60 KNOCKOUT MICE

E Chiou\*. *University of Washington, Brush Prairie, WA*

10.1136/jim-2017-000663.41

**Purpose of study** The Ro60 protein is a prominent autoantigen in systemic lupus erythematosus with anti-Ro antibodies strongly associated with UV-mediated skin rashes. It was recently reported that Ro binds to Alu RNAs derived from short interspersed retroelements (SINEs). In studies, loss of Ro60 in human cell lines resulted in the accumulation of Alu RNAs and the dysregulation of IFN-stimulated genes (ISGs). In addition, Ro60 knockout mice spontaneously developed a

lupus-like syndrome associated with autoantibodies and glomerulonephritis. Since SINE transcripts have been shown to be increased following DNA damage, we examined the relationship between Ro60, SINEs, and the inflammatory response after UV irradiation in mice.

**Methods used** C57BL/6 and Ro60 KO mice (n=3) were irradiated with UVB 500 mJ/cm<sup>2</sup> once. Skin biopsies were performed at baseline and 1 day following UVB exposure. RNA was extracted from the skin, and RNA expression of retroelements [B1 and B2 SINEs (rodent equivalents of human Alu)], inflammatory markers including type I IFNs, ISGs and Y RNAs were quantified by RT-qPCR.

**Summary of results** At baseline, Ro60 KO mice exhibited increased expression of ISGs compared to C57BL/6 mice in Isg15, Isg20, and Mx1. Y1 and Y3 RNAs were virtually undetectable in Ro60 KO mice after UVB irradiation. This supports the current theory that Ro60 is involved in RNA processing and quality control including the stabilisation of RNA polymerase III transcripts as seen with La protein. While B1 and B2 SINEs were not elevated in Ro60 KO mice compared to C57BL/6 mice at baseline, SINEs were increased in both Ro60 KO and C57BL/6 mice after UVB. These results are consistent with the possibility that retroelements play a role in the inflammatory response following UVB irradiation.

**Conclusions** Increases in ISGs observed at baseline in Ro60 KO mice compared to control C57BL/6 mice may contribute to autoimmunity and lupus-like syndrome reported previously. Furthermore, the accumulation of SINE transcripts after UV irradiation may overwhelm the binding capacity of Ro60, leading to stimulation of innate immune response. A clearer understanding of the relationship between autoimmunity in Ro60 KO mice and changes in the relative amounts of SINEs versus Ro60 protein could provide a new paradigm of how environmental stimuli trigger lupus.

## Infectious diseases I

## Concurrent session

12:45 PM

Thursday, January 25, 2018

42

# USE OF C-REACTIVE PROTEIN CAN SAFELY DECREASE THE NUMBER OF EMERGENCY DEPARTMENT PATIENTS WITH SEPSIS WHO REQUIRE BLOOD CULTURES

<sup>1</sup>K Dullemond\*, <sup>1,2</sup>R Stenstrom. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>St Paul's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.42

**Purpose of study** Sepsis protocols call for the acquisition of blood cultures in septic emergency department (ED) patients. However, the criteria for blood cultures are vague, they are costly, only positive 8%–12% of the time, with up to half of these being false positives. The objective of this study was to establish if positive blood cultures could be excluded in low-risk sepsis patients with levels of CRP below 20 ml/L.

**Methods used** This was a multicenter prospective cohort study of 883 ED patients at St Paul's and Mount St Joseph's hospitals in Vancouver with sepsis (2 or more SIRS criteria and infection) and none of: immunocompromised, injection drug

use, indwelling vascular device or septic shock (SBP <90 mmHg). Consecutive patients with sepsis had CRP and blood cultures obtained at the same time.

**Outcomes** True positive blood cultures, false positive blood cultures, positive blood cultures that changed patient management. True and false positive blood cultures were based on Infectious Disease Society of America Guidelines, and change in management was defined as change in type or length of antibiotic therapy and was blindly adjudicated by a medical microbiologist.

**Summary of results** 883 ED patients with sepsis met inclusion criteria. Mean age was 49.1 years and 55.7% were male. Blood cultures were positive in 124/883 (14%) subjects, of which 21/124 were false positive (17%). CRP was >20 mg/L in 645/883 (73%) of patients. Of 218 subjects with a CRP <20 mg/L, 2 had a positive blood culture (0.9%; 95% CI: 0.1% to 4.1%). Management was not changed in any patient with a positive blood culture and CRP level <20 mg/L. Of 21 subjects with a false positive blood culture, CRP was <20 mg/L for 12 (60%).

**Conclusions** In this cohort of low-risk sepsis patients, based on a CRP of <20 mg/L, acquisition of blood cultures could be safely avoided in 24.7% of patients, at significant savings to the health care system.

43

#### THE ROLE OF POINT MUTATIONS IN RESISTANCE OF METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS TO NOVEL METHIONINE tRNA SYNTHETASE INHIBITORS

J Gilmer\*, O Faghii, JR Gillespie, F Buckner. University of Washington, Spokane, WA

10.1136/jim-2017-000663.43

**Purpose of study** New antibiotics are required to combat bacteria such as methicillin resistant *Staphylococcus aureus* (MRSA) that have become resistant to standard treatments. The bacterial methionine tRNA synthetase (MetRS) enzyme is the target of a series of small molecule inhibitors being developed as novel antibiotics. Experiments were designed to address the potential for resistance in MRSA to develop against two MetRS inhibitors (1717 and 2144) and to characterise mutations in the MetRS enzyme.

**Methods used** Twelve MRSA populations resistant to 1717 and 2144 were generated via twenty serial passages, and then minimum inhibitory concentration assays were conducted to determine the magnitude of their resistance.

**Summary of results** All of the mutant populations developed resistance with the lowest-fold increase in MIC being 64 and the highest-fold change being 128. Sequences of the MetRS genes were characterised in 8 of the populations (to date) and showed the following independent point mutations: I57N, G54A, and I238F. A G314A mutation was observed in a subset of bacteria with the I238F mutation. Also, some mutations were observed in the upstream non-coding region of unknown significance.

**Conclusions** Cross-resistance between different MetRS inhibitors is being investigated as well as the fitness of the bacteria containing discrete mutations. By analysing the mechanisms of resistance to MetRS inhibitors, it may be possible to design new compounds or strategies that circumvent risk of resistance developing to this novel class of antibiotics.

44

#### HEPATITIS B PROPHYLAXIS AFTER ALLOGENEIC STEM CELL TRANSPLANTATION IN THE ERA OF NOVEL ANTIVIRAL DRUGS: A SYSTEMATIC REVIEW

<sup>1</sup>A Siyahian\*, <sup>2</sup>S Malik, <sup>2</sup>A Mushtaq, <sup>3</sup>C Howe, <sup>2</sup>A Majeed, <sup>2</sup>T Zangeneh, <sup>2</sup>I Riaz, <sup>2</sup>W Faridi, <sup>2</sup>S Iftikhar, <sup>2</sup>Z Warraich, <sup>2</sup>F Anwer. <sup>1</sup>University of Arizona College of Medicine, Tucson, AZ; <sup>2</sup>University of Arizona, Tucson, AZ; <sup>3</sup>University of Arizona Health Sciences Library, Tucson, AZ

10.1136/jim-2017-000663.44

**Purpose of study** Worldwide, 2 billion people have evidence of past or present HBV infection, with an estimated 248 million chronic carriers. Patients undergoing stem cell transplantation (SCT) are at a higher risk of hepatitis B virus reactivation (HBVr). The efficacy of lamivudine (LAM) is well documented, but increased incidence of resistant HBV strains is a major concern. The advent of novel antivirals can provide new prophylactic options for high risk (HR) population undergoing allogeneic SCT.

**Methods used** A systematic review was performed using 7 databases (PubMed/Medline, Embase, Scopus, Cochrane, WOS, CINAHL, ClinicalTrials.gov—last accessed June 21, 2017) to evaluate effectiveness of antivirals as prophylaxis for HBVr.

**Summary of results** We identified 13 studies (12 retrospective and 1 prospective) with 832 high risk and 1526 low risk patients undergoing allogeneic SCT. We evaluated results for 4 antiviral drugs. Studies were grouped into 3 categories: LAM vs no prophylaxis (NP), entecavir (ENV) vs NP, and ENV vs other antiviral and NP. Results suggested that ENV was very effective against HBVr after SCT. LAM prophylaxis shows 5%–30% HBVr in HR population. With limited data, ENV appears to be highly effective with 0%–5.56% HBVr in HR group. Prophylaxis duration was between 6 to 30 months. There is significant heterogeneity among studies for HR definition, antiviral agent, dose, and duration.

**Conclusions** ENV proved to be the very effective in prophylactically treating HBVr compared to lamivudine or no prophylaxis. LAM prophylaxis continues to be an effective strategy in HR population. Further studies are needed to compare the efficacy of entecavir to other antiviral drugs in patients with allogeneic SCT in appropriately powered multicenter prospective studies.

45

#### A RISK AND SYMPTOM SCORE PREDICTIVE FOR ACUTE HIV INFECTION IN MEN WHO HAVE SEX WITH MEN

T Lin\*, S Gianella, T Tenenbaum, SJ Little, M Hoenigl. UC San Diego School of Medicine, San Diego, CA

10.1136/jim-2017-000663.45

**Purpose of study** Diagnosing acute HIV infection (AHI) is resource-intensive. Risk behavior-based scores to predict for AHI, such as the San Diego Early Test (SDET) score, can be used to identify those who require utilisation of tests for AHI (e.g., HIV nucleotide amplification test [NAT]). Scores that incorporate symptoms of acute retroviral syndrome may be more predictive and improve generalizability, however. The purpose of this study was to develop a 'SDET+' score that uses symptoms in addition to SDET variables.

**Methods used** Analysis included MSM self-presenting to a community screening program in San Diego and 1) tested

positive for AHI (antibody-negative, HIV NAT-positive) from 2007–2017 or 2) tested HIV NAT-negative in 2017. Eleven symptoms (headache, pharyngitis, rash, myalgia, fatigue, fever, night sweats, gastrointestinal symptoms, arthralgia, weight loss >2.5 kg, or lymphadenopathy) in the 14 days prior to testing were assessed; risk behaviours for the 3 months prior to the testing event were assessed and transformed to the SDET variables (Y/N) adjusted to a 3 month reporting period:  $\geq 3$  male partners, condomless receptive anal intercourse (CRAI) plus  $\geq 2$  male partners, and bacterial STI (syphilis, gonorrhoea, chlamydia). Variables with  $p < 0.2$  in univariate logistic regression models for AHI were entered into a multivariate model. Variables with  $p < 0.05$  were then given a score value equal to its odds ratio (OR). The score was assessed using receiver operating characteristic area-under-the-curve (AUC).

**Summary of results** 757 MSM were included in analysis; 110 had AHI. Myalgia (OR 6.6 [95% CI: 2.5 to 17.5]), fever (OR 9.5 [95% CI: 3.5 to 25.7]), weight loss (OR 7.4 [95% CI: 1.9 to 29.5]), and CRAI plus  $\geq 2$  male partners (OR 7.4 [95% CI: 3.1 to 17.6]) remained significant in the multivariate model. The SDET +score yielded an AUC of 0.89 (95% CI: 0.85 to 0.93). An optimal cut-off  $\geq 8.45$  by Youden's index was 69% sensitive, 94% specific, with positive predictive value 64%, negative predictive value 95%, positive likelihood ratio 10.6 and negative likelihood ratio 0.33.

**Conclusions** The SDET +score outperforms the SDET score (AUC 0.72) in predicting AHI in a cohort of MSM self-presenting for screening, and may better inform allocation of diagnostic resources in settings that do not routinely test for AHI. Validation in other populations is needed.

#### 46 INDIVIDUAL-LEVEL FACTORS DID NOT PREDICT ENGAGEMENT AFTER A DATA TO CARE ENCOUNTER

<sup>1</sup>E Chang\*, <sup>1</sup>MR Golden, <sup>2</sup>M Fleming, <sup>2</sup>A Nunez, <sup>1</sup>JC Dombrowski. <sup>1</sup>University of Washington, Mercer Island, WA; <sup>2</sup>Public Health–Seattle and King County HIV/STD Program, Seattle, WA

10.1136/jim-2017-000663.46

**Purpose of study** Data to Care (DtC) is a public health strategy that uses HIV surveillance data to direct interventions to improve patient engagement in HIV care. We evaluated the association between DtC participant characteristics and subsequent engagement in HIV care.

**Methods used** The DtC program in King County, Washington uses surveillance data to identify persons poorly engaged in HIV care (no lab results reported for  $\geq 12$  mo. or a viral load >500 copies/mL at last report  $\geq 6$  mo. after diagnosis). Disease intervention specialists attempt to contact these persons and assist them in care reengagement. Participants complete a self-interview with questions about insurance, housing, substance use, attitudes toward HIV infection and medical care, and a depression screen. We used  $\chi^2$  tests to analyse the association between predictor variables and the outcome of 'successful engagement' in the year following, defined as  $\geq 2$  laboratory results  $\geq 60$  days apart or  $\geq 1$  suppressed HIV RNA lab value (<200 copies/mL) reported to surveillance. In a post-hoc analysis we compared engagement among persons with and without a combination of substance abuse, unstable housing and positive depression screen.

**Summary of results** 408 persons completed a DtC interview. 204 (50%) successfully engaged in care in the year after interview. Engagement was not associated with substance use, unstable housing, positive depression screen, a combination of  $\geq 2$  of the aforementioned factors, attitudinal barriers, or health insurance. Only viral suppression at time of enrollment predicted successful engagement ( $p < 0.001$ ).

**Conclusions** Half of poorly engaged persons with HIV remained disengaged from care following a DtC intervention. Commonly cited individual-level potential barriers to care were not associated with persistent poor engagement, highlighting the heterogeneity of factors that potentially contribute to why persons with HIV remain out of care, including healthcare system and contextual factors.

#### 47 PRE-EXPOSURE PROPHYLAXIS KNOWLEDGE, ATTITUDES, AND BARRIERS AMONG INDIVIDUALS SEEKING CARE AT STI CLINICS

<sup>1</sup>T Shende\*, <sup>2</sup>CM Perez-Velez, <sup>3</sup>A Okello, <sup>3</sup>A Guido, <sup>3</sup>A Georgescu, <sup>3</sup>L Fantry. <sup>1</sup>University of Arizona College of Medicine-Tucson, Tucson, AZ; <sup>2</sup>Pima County Health Department, Tucson, AZ; <sup>3</sup>University of Arizona Department of Medicine, Tucson, AZ

10.1136/jim-2017-000663.47

**Purpose of study** This study aims to investigate the knowledge, attitudes and barriers about Pre-Exposure Prophylaxis (PrEP) among adults seeking care at Sexually Transmitted Infection (STI) Clinics in Pima County, Arizona.

**Methods used** HIV negative patients receiving family planning services and/or STI testing at Pima County STI clinics were surveyed. Study personnel conducted the survey in a confidential room. The primary outcome was to compare PrEP knowledge, attitudes and barriers between Hispanic and non-Hispanic participants. The secondary outcome was to assess differences between participants with high risk behaviours and the total population.

**Summary of results** Ninety-six patients (51 Hispanics, 45 non-Hispanics) were surveyed. Seventy-one percent ( $n=68$ ) stated that they had no prior knowledge of PrEP. Overall, the median interest in PrEP on a scale of 1–7 (1=lowest interest, 7=highest interest) was 4.4. Hispanics and non-Hispanics showed no statistically significant difference in perceived HIV risk ( $p < 0.2698$ ), prior PrEP knowledge ( $p < 0.4042$ ) or interest ( $p < 0.7054$ ). Both groups demonstrated a willingness to participate in regular visits with healthcare providers ( $p < 0.6812$ ), blood and urine testing ( $p < 0.8196$ ) and compliance with a daily pill regimen ( $p < 0.602$ ).

The secondary outcome defined the high risk behaviours as participants that identified as MSM, women who have sex with MSMs, practice receptive anal, previously diagnosed with rectal gonorrhoea and/or syphilis, injection drug user (IDU), partner of IDU and/or exchanged sex for drugs or money. Participants who fit the criteria ( $n=29$ ) compared to the remaining population ( $n=67$ ) demonstrated a higher perceived risk ( $p < 0.0005$ ), were more aware of PrEP therapy ( $p < 0.000$ ) and showed a greater interest in treatment ( $p < 0.0148$ ).

**Conclusions** This study demonstrated a lack of PrEP knowledge among both Hispanic and non-Hispanic STI clinic patients. It also showed highest interest in PrEP among patients at a perceived and actual increased risk. Further study is necessary to investigate how to increase access to PrEP.



#### 48 HOW GRAM-POSITIVE BACTERIA SURVIVE WITHOUT THE ESSENTIAL HISTIDINE KINASE WALK

TD Ho\*, V Keidel, H Szurmant, CP Zschiedrich. *College of Osteopathic Medicine of the Pacific, Western University of Health Sciences, Pomona, CA*

10.1136/jim-2017-000663.48

**Purpose of study** All bacteria of the order Firmicutes feature the essential signal transduction system WalRK, a two component system. Previous studies identified the system as a connector between the growth state of the cell and cell wall homeostasis. The system has garnered significant interest as a perceived antimicrobial drug target given its essentiality in several important human pathogens. Utilising the soil bacterium *Bacillus subtilis* as a model organism, the present study aimed at identifying if and how bacteria can survive without WalR and/or WalK. Such information will reveal new pathways involved in WalRK system regulation and identify new Achilles heels of gram-positive pathogens for drug development.

**Methods used** We utilised the cre-lox system to engineer a strain that allows for the precise and inducible excision of the native *walRK* locus. Thus, under inducing conditions, growth of *B. subtilis* solely relies on the presence of additional engineered ectopic *walR* and/or *walK* alleles. Secondary site suppressor strains growing in the absence of WalK could be obtained and were characterised utilising Western blotting, RT-PCR and gene sequencing to answer 'How does *B. subtilis* survive without the essential kinase WalK?'

**Summary of results** Strains without ectopic *walR* copies do not acquire secondary site suppressors and die. However in the presence of a wildtype copy of *walR* but absence of its kinase WalK suppressor mutants are easily obtained. We selected 30 suppressor mutants and sequenced the *walR* gene. No mutations could be observed in that gene, suggesting a different mechanism to overcome the absence of WalK. Western blotting revealed increased WalR protein concentrations in all suppressor strains. RT-PCR analysis demonstrated increased *walR* mRNA levels.

**Conclusions** Our results demonstrate that the absence of WalK can be overcome by overexpression of WalR. Overexpression of WalR is achieved by secondary mutations that lead to increased *walR* mRNA levels. We hypothesise that mutations are either in a specific transcription factor or an RNase. Further analysis aims to distinguish between the two possibilities. We conclude that WalR is a better target for anti-infection than WalK since suppressors are not easily obtained in WalR absence.

#### 49 FOCUS OF INFECTION AND RISK FACTORS FOR STAPHYLOCOCCUS AUREUS BACTEREMIA AT AGA KHAN UNIVERSITY HOSPITAL IN NAIROBI, KENYA

<sup>1</sup>J Adam, <sup>1</sup>J Dobrick\*, <sup>1,2</sup>R Adam. <sup>1</sup>University of Arizona, Tucson, AZ; <sup>2</sup>Aga Khan University Hospital Nairobi, Nairobi, Kenya

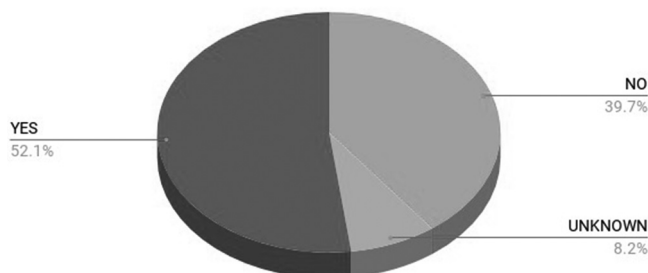
10.1136/jim-2017-000663.49

**Purpose of study** *Staphylococcus aureus* accounts for 16% of community onset bacteremia and 6% of hospital onset bacteremia at Aga Khan University Hospital Nairobi (AKUHN). Data about the aetiology of *S. aureus* bacteremia will help optimise prevention and treatment.

**Methods used** Charts were reviewed for 146 patients at AKUHN with blood cultures positive for *S. aureus*. The focus of infection was identified.

**Summary of results** At AKUHN, hospital onset bacteremia from *S. aureus* accounted for 25% of cases while community onset accounted for 75%. For patients with hospital onset bacteremia, the two most common foci of infection were peripheral IV (54%) and central venous catheter (CVC) (22%). The most common foci of infection for community onset bacteremia were dialysis catheters (23%), unknown focus (20%), skin (17%) and osteomyelitis (9%).

Was the *S. aureus* Bacteremia Healthcare Related?



**Abstract 49 Figure 1** Percent of *S. aureus* bacteremia cases that were associated with the healthcare setting (52%)

**Conclusions** The majority of *S. aureus* bacteremia is community onset, with dialysis catheters as the most common source. Most of hospital acquired bacteremia is from venous catheters, with peripheral IV infections being more common than central venous catheter infections. Mortality rates were similar for both hospital and community onset *S. aureus* bacteremia. Overall, 52% of the *S. aureus* bacteremia cases were associated with the healthcare setting.

#### 50 COST OF POINT-OF-CARE TEST PANEL FOR HIV POSITIVE PATIENTS ON ANTIRETROVIRAL THERAPY

<sup>1</sup>K Simeon\*, <sup>2</sup>J Dorward, <sup>2</sup>N Garrett, <sup>1</sup>R Barnabas, <sup>1</sup>P Drain. <sup>1</sup>University of Washington School of Medicine, Indian, AK; <sup>2</sup>CAPRISA, Durban, South Africa

10.1136/jim-2017-000663.50

**Purpose of study** With many more HIV positive patients starting antiretroviral therapy (ART), there is a growing need for routine blood monitoring. More laboratory tests are a significant cost and resource burden for clinics and laboratories. We measured the cost of decentralised point-of-care (POC) testing compared to centralised laboratory testing in South Africa.

**Methods used** We conducted a cost analysis from a clinic perspective using a micro-costing approach for all POC tests recommended for HIV monitoring: HIV viral load (VL) (Xpert HIV-1 VL, Cepheid), serum creatinine (Statsensor Xpress-i, Nova Biomedical) and CD4 count (Pima, Alere). This was compared to the cost of each test when conducted at public and private centralised laboratories, and includes materials, staff time, transport, and assay cost. We completed time and motion studies for sample collection and processing in the POC lab. We conducted sensitivity analyses for various patient scenarios.

**Summary of results** Overall, excluding POC equipment and maintenance costs, a full panel of ART monitoring tests was cheaper when performed by POC versus centralised laboratory (table 1). Taking the costs of obtaining equipment/space and



maintaining a decentralised POC lab for 5 years (\$35,753), a full panel of tests cost \$47.44 when performed using POC on 100 patients per month (table 2).

**Conclusions** Widespread POC testing is a potentially cost saving option to increase testing capacity in resource-limited-settings. While the initial cost of equipment setup and maintenance could be a barrier for clinics, those clinics with higher patient volumes will see additional cost saving to offset the initial investment in equipment.

**Abstract 50 Table 1** Cost of ART monitoring tests (USD)

Test	Centralised laboratory		POC
	Public	Private	
Creatinine	4.27	7.40	9.77
HIV VL	25.85	41.64	22.89
CD4	6.89	13.18	8.84
Total	37.01	62.22	41.50

**Abstract 50 Table 2** Cost per result, including POC equipment, in different patient load scenarios (USD)

Test	Patient load per month (POC)				All patient loads	
	5	10	50	100	Public	Private
Creatinine	15.62	12.69	10.35	10.06	4.27	7.40
HIV VL	108.42	70.41	31.35	26.99	25.85	41.64
CD4	39.87	24.36	11.94	10.39	6.89	13.18
Total Cost	163.91	107.46	53.74	47.44	37.01	62.22

## Neonatology–pulmonary I

### Concurrent session

12:45 PM

Thursday, January 25, 2018

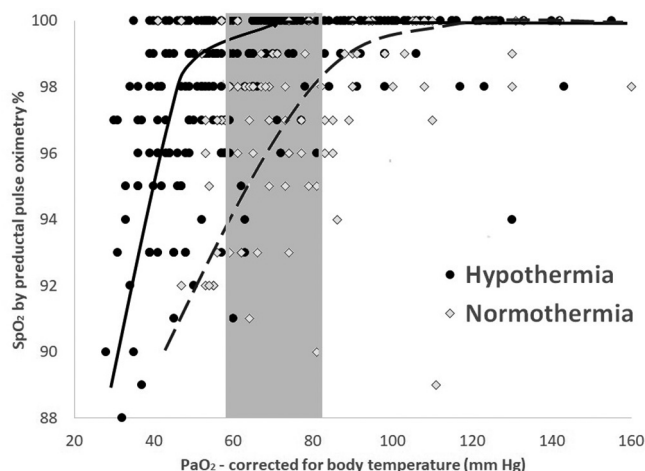
#### 51 NON-INVASIVE MONITORING OF GAS EXCHANGE DURING THERAPEUTIC HYPOTHERMIA (TH) IN NEONATES- ARE WE DOING IT RIGHT?

<sup>1</sup>B Afzal\*, <sup>2</sup>S Lakshminrusimha. <sup>1</sup>TUFTS Medical Centre, Boston, MA; <sup>2</sup>UCDavis, Davis, CA

10.1136/jim-2017-000663.51

**Purpose of study** Persistent pulmonary hypertension of the newborns (PPHN) is associated with hypoxic-ischaemic encephalopathy (HIE) and is exacerbated by hypoxemia and hypercarbia. Adequacy of oxygenation and ventilation are assessed by arterial blood gas (ABG) analysis, pulse oximetry (SpO<sub>2</sub>) and capnography (ET-CO<sub>2</sub>). We studied the effect of body temperature during TH on PaO<sub>2</sub>, PaCO<sub>2</sub>, SpO<sub>2</sub> and ET-CO<sub>2</sub>.

**Methods used** This is a retrospective chart review of 56 neonates who underwent TH for HIE between July 2009 and March 2016. Data from 1326 ABGs with simultaneous SpO<sub>2</sub> and ET-CO<sub>2</sub> measurements were extracted and were divided into two groups based on esophageal temperature: normothermia and hypothermia. Data were analysed by Mann-Whitney U test.



**Abstract 51 Figure 1** Scatter-plot of SpO<sub>2</sub> and PaO<sub>2</sub>. For a clinically acceptable PaO<sub>2</sub> of 60–80 mmHg (shaded vertical bar), SpO<sub>2</sub> values were in the mid-90s during normothermia but in the 97 to 99% range during TH

**Summary of results** During hypothermia, oxygen dissociation curve was shifted to the left (figure 1) and SpO<sub>2</sub> 92%–98% was associated with significantly lower temperature corrected PaO<sub>2</sub> (49 mmHg, IQR:41–58) compared to normothermia (69 mmHg, IQR:59–81). Hypothermia reduced PaO<sub>2</sub> from 75 (59–101) to 61 (48–82) mmHg and PaCO<sub>2</sub> from 48 (42–57) to 41 (37–49) mmHg (p<0.001). ET-CO<sub>2</sub> accurately estimated PaCO<sub>2</sub> levels (corrected for temperature) during hypothermia. **Conclusions** Monitoring oxygenation by pulse oximetry (SpO<sub>2</sub>) alone may underestimate hypoxemia during hypothermia in HIE and potentially exacerbate PPHN. We recommend frequent blood arterial blood gas monitoring with less reliance on pulse oximetry during TH.

#### 52 PRETERM BIRTH AND RESPIRATORY SUPPORT APPEAR TO ALTER CELL TYPES AND CAPILLARIES IN THE BRAIN OF LAMBS

<sup>1</sup>L Pettet\*, <sup>1</sup>A Reberntsch, <sup>1</sup>E Dawson, <sup>1</sup>Z Wang, <sup>1</sup>R Hicks, <sup>1</sup>M Dahl, <sup>2</sup>D Null, <sup>1</sup>B Yoder, <sup>1</sup>K Albertine. <sup>1</sup>University of Utah, Salt Lake City, UT; <sup>2</sup>UC Davis, Davis, CA

10.1136/jim-2017-000663.52

**Purpose of study** Prolonged mechanical ventilation (MV) of premature infants leads to lung injury. Frequently, the brain is injured. Our studies, using preterm lambs, indicate that MV from 3 d to 21 d shifts balance to more apoptosis and less proliferation of neurons, immature and mature oligodendrocytes, and astrocytes. These results are consistent with less brain-derived neurotrophic factor in the same brain tissue.

**Methods used** We hypothesised that progressively longer period of MV will alter presence of neural stem cells and neuronal progenitor cells, as well as capillaries in the brain. Preterm lambs, treated with antenatal steroids and postnatal surfactant, were managed by MV or high-frequency nasal ventilation (HFNV) for either 3 d or 21 d (n=4/group). We use HFNV as the positive gold-standard for alveolar formation in the lung. At the end of 3 d or 21 d, cortical brain tissue from the temporal lobe was fixed. We used immunohistochemistry to localise Nestin-positive neural stem cells, double cortin (DCX)-positive neuronal progenitor cells, and p-glycoprotein-positive capillaries. We used stereology to quantify

## Abstracts

surface density of each cell type in cortical grey matter, using systematic, uniform, random sampling.

**Summary of results** Initial results for  $n=2/\text{group}$  are summarised. Surface density ( $\text{Sv}$ ;  $\text{cm}^{-1}$ ) for Nestin-positive cells appears to increase from 3 d to 21 d of MV (average Sv 5 and 46, respectively), and from 3 d to 21 d HFNV (average Sv 7 and 19, respectively). Sv for DCX-positive cells appears to decrease from 3 d to 21 d of MV (average Sv 94 to 71, respectively), and from 3 d to 21 d HFNV (average Sv 95 and 54, respectively). Sv for capillaries also appears to decrease from 3 d to 21 d of MV (average Sv 84 to 67, respectively), and from 3 d to 21 d HFNV (average Sv 101 and 71, respectively).

**Conclusions** Contrary to our hypothesis, these initial results suggest that preterm birth and any ventilatory support may change the proportion of neural stem cells (Nestin-positive cells), neuronal progenitor cells (DCX-positive cells), and capillaries (p-glycoprotein-positive microvessels) in the brain as the duration of respiratory support increases. Analyses are ongoing to increase sample size. HL110002.

### 53 GRADED OXYGEN SATURATION TARGETS IN EXTREMELY PRETERM INFANTS: EFFECT OF GROWTH STATUS ON MORTALITY AND OUTCOMES

<sup>1</sup>H Muniraman\*, <sup>1,2</sup>V Arora, <sup>1</sup>R Ramanathan, <sup>1</sup>M Durand, <sup>1</sup>R Cayabyab. <sup>1</sup>Division of Neonatology, LAC+USC Medical Centre, Keck School of Medicine of USC, Los Angeles, CA; <sup>2</sup>Kaiser Foundation Hospital, Downey, CA

10.1136/jim-2017-000663.53

**Purpose of study** To evaluate the effect of growth status on mortality and other clinical outcomes in extremely preterm infants (24 0/7–27 6/7 weeks gestation) exposed to graded versus static oxygen saturation ( $\text{SpO}_2$ ) targets.

**Methods used** Retrospective study, comparing rates of mortality and retinopathy of prematurity (ROP) between infants exposed to static  $\text{SpO}_2$  targets (90%–94%, 1995–2001) and infants exposed to graded  $\text{SpO}_2$  targets (83%–89% until 32 6/7 wks post-menstrual age (PMA), 90%–94% until 35 6/7 wks PMA, and >94% at  $\geq 36$  wks PMA, 2003–2010) after stratification based on growth status, SGA vs AGA.

**Summary of results** A total of 487 infants with static  $\text{SpO}_2$  ( $n=267$ ; AGA:245, SGA:22) and graded  $\text{SpO}_2$  ( $n=220$ ; AGA:185, SGA:35) were included. In SGA infants, there was

no difference in mortality ( $p=0.55$ ) and severe ROP ( $p=0.47$ ) between the static and graded  $\text{SpO}_2$  groups. In AGA infants, there was no difference in mortality ( $p=0.44$ ). However, the incidence of severe ROP ( $p<0.001$ ) and the rate of laser therapy for ROP, bronchopulmonary dysplasia, severe intraventricular haemorrhage and necrotizing enterocolitis were significantly reduced in AGA infants managed with graded  $\text{SpO}_2$ , but not in SGA infants (table 1).

**Conclusions** Growth status (SGA or AGA) was not associated with increased mortality in infants managed with graded  $\text{SpO}_2$ . However severe ROP was significantly reduced in AGA infants exposed to graded  $\text{SpO}_2$ . Use of a lower  $\text{SpO}_2$  target during Phase I of ROP was not associated with an increase in mortality.

54

### DECREASED VASCULAR EXTRACELLULAR SUPEROXIDE DISMUTASE IMPAIRS NEONATAL PULMONARY DEVELOPMENT

LG Sherlock\*, A Trumpie, J Sandoval, S McKenna, C Delaney, C Wright, E Nozik-Grayck. University of Colorado, Denver, CO

10.1136/jim-2017-000663.54

**Purpose of study** Extracellular superoxide dismutase (SOD3) is the only extracellular antioxidant defense for superoxide. It is highly expressed in the lung and vasculature, and SOD3 knock-out mice develop worse experimental BPD. A naturally occurring SOD3 single nucleotide polymorphism (SNP), the  $\text{R}_{213}\text{G}$  SNP, does not change SOD3 enzyme activity, but alters SOD3 tissue binding properties. It decreases matrix binding affinity and pulmonary vascular content of SOD3. Expression of the  $\text{R}_{213}\text{G}$  SNP in adult humans and mice increases the risk of cardiovascular disease, and juvenile and adult mice show PH at baseline. The impact of this SNP on the developing lung is unknown. We hypothesised that the  $\text{R}_{213}\text{G}$  SNP would impair early pulmonary development in neonatal mice.

**Methods used** Wild type (WT) mice and homozygous  $\text{R}_{213}\text{G}$  mice were evaluated. Protein expression for SOD3 was measured by Western blot, and mRNA expression for SOD3 and TGF- $\beta$  was determined by PCR at P0, P3, P7 and P14 ( $n=2-4$ ). Lung sections at P14 were immunostained with vWF and  $\alpha\text{SMA}$  ( $n=4-6$ ). Alveolar development was evaluated by radial alveolar count (RAC), mean linear intercept (MLI), and airspace area (AA). Vascular development was evaluated by vessel

Abstract 53 Table 1 Mortality and clinical outcomes

	SGA static $\text{SpO}_2$ group ( $n=22$ )	SGA graded $\text{SpO}_2$ group ( $n=35$ )	P value(a)	AGA static $\text{SpO}_2$ group ( $n=245$ )	AGA graded $\text{SpO}_2$ group ( $n=185$ )	P value(a)
Birth weight (grams) median (25–75th percentile)	545 (480–608)	505 (476–545)	0.20	760 (677–853)	755 (660–855)	0.79
GA (weeks) median (25–75th percentile)	26 (25–26)	26 (25–27)	0.48	26 (25–26.5)	25.8 (24.8–26.4)	0.48
Antenatal steroids n (%)	15/22 (68.2)	32/35 (91.5)	0.02	173/241 (71.8)	150/183 (82.0)	0.01
Chorioamnionitis n (%)	3/22 (13.6)	4/35 (11.4) (b)	1.00	54/242 (22.3)	50/183 (27.3)	0.23
Death n (%)	6/20 (30)	8/35 (22)	0.55	22/223 (9.9)	14/182 (7.7)	0.44
Severe ROP n (%)	10/18 (55.6)	13/29 (44.8)	0.47	102/214 (47.7)	29/168 (17.3)	0.000
Laser Rx for ROP n (%)	7/18 (38.9)	7/29 (24.1)	0.28	74/214 (34.6)	32/169 (18.9)	0.001
Bronchopulmonary dysplasia n (%)	10/17 (58.8)	16/29 (55.2)	0.80	74/211 (35)	39/170 (22.3)	0.01
Severe Intraventricular haemorrhage n (%)	2/16 (12.5)	6/35 (17.1)	0.67	54/217 (24.9)	27/184 (14.7)	0.01
Patent ductus arteriosus n (%)	17/22 (77.3)	28/35 (80)	0.80	196/245 (80)	152/185 (82.2)	0.57
Necrotizing enterocolitis n (%)	2/22 (9.1)	3/34 (11.8) (b)	1.00	35/245 (14.3)	12/184 (6.5)	0.01

a: Chi-square tests and b: Fischer exact test

density. Data were analysed by t-test. Significance defined as  $p < 0.05$ .

**Summary of results** Lung SOD3 protein and mRNA expression are developmentally regulated, initially low at P0 and increasing by P14. ( $p < 0.01$ ) SOD3 gene expression is significantly higher in the R<sub>213</sub>G mice compared to WT at P0 and P3 ( $p < 0.05$ ). There is no difference between strains in TGF B expression.

R<sub>213</sub>G mice have aberrant vascular development compared to WT, with decreased vessel density ( $p < 0.01$ ). R<sub>213</sub>G mice have subtle impaired alveolar development compared to WT, with increased AA ( $p = 0.05$ ), and a trend to decreased RAC ( $p = 0.11$ ) and increased MLI ( $p = 0.06$ ).

**Conclusions** A change in the distribution of SOD3 due to the R<sub>213</sub>G SNP leads to impaired pulmonary vascular development. This demonstrates that both overall SOD3 levels and SOD3 localization are important in pulmonary organogenesis. This has important therapeutic implications, because an improved understanding of where and when SOD3 is critical may lead to the development of more specifically targeted antioxidant therapies for the prevention and treatment of BPD and PH.

## 55 EXPOSURE TO DISSOLVABLE TOBACCO PRODUCTS RESULTS IN DECREASED PROLIFERATION, INCREASED APOPTOSIS, AND MYOGENIC DIFFERENTIATION IN FETAL RAT LUNG FIBROBLASTS

<sup>1</sup>C Lee\*, <sup>1</sup>R Sakurai, <sup>2</sup>V Karam, <sup>2</sup>M Gong, <sup>2</sup>B Diaz, <sup>1</sup>V Rehan. <sup>1</sup>Harbor-UCLA Medical Centre, Torrance, CA; <sup>2</sup>Los Angeles Biomedical Research Institute, Torrance, CA

10.1136/jim-2017-000663.55

**Purpose of study** Although advertised as a safer alternative to cigarettes, Dissolvable Tobacco Products (DTPs) were introduced with little research on safety (i.e. no data on their effects on the developing lung). Since nicotine has detrimental effects on fetal rat lung fibroblast (FRLF) proliferation and differentiation, we hypothesised that DTPs would be equally detrimental for FRLF. However, due to the varied components in DTPs, the effects of each product will differ. We compared two DTPs [Kayak Apple (KYA) and Kodiak Wintergreen (KDW)] with those of nicotine bitartrate (NB).

**Methods used** Nicotine content of KYA and KDW dissolved in DMEM was determined by LC-MS. Lung fibroblasts from day 19 Sprague Dawley rat fetuses were isolated, and at 80%–90% confluence, cells were treated for 24 or 72 hour with nicotine ( $10^{-11}$ ,  $10^{-9}$ ,  $10^{-6}$  M), either as NB or KYA and KDW. Cell proliferation (thymidine incorporation), cell apoptosis (BcL-2, Bax, and p-caspase 3 by Western analysis), and mesenchymal markers of differentiation (fibronectin, calponin, vimentin, PPAR $\gamma$ , LEF-1, and collagen I and III by Western analysis and/or immunoblotting) were determined. Effect of nicotine on DNA methyltransferase (Dnmt) 3a and collagens I and III promoter methylation was also determined.

**Summary of results** Compared to the control group, KYA and KDW treated FRLFs showed significantly 1)  $\downarrow$  cell proliferation ( $\downarrow$  thymidine incorporation); 2)  $\uparrow$  cell apoptosis ( $\downarrow$  BcL-2/Bax ratio and  $\uparrow$  p-caspase); 3) dose dependent alterations in mesenchymal differentiation markers ( $\downarrow$  PPAR $\gamma$  and  $\uparrow$  fibronectin, vimentin, calponin, and collagen I and III levels) indicative of myogenic differentiation; and 4) Dnmt3a and

collagen I promoter methylation changes, suggesting epigenetic effects underlying nicotine-mediated myogenic differentiation of FRLFs. Effects were more pronounced with KYA vs KDW.

**Conclusions** DTPs cause dose-dependent alterations in FRLF proliferation, apoptosis, differentiation, and reparative potential, indicative of their differentiation to a myogenic phenotype. These effects are epigenetically mediated, are prominent with DTPs vs nicotine exposure, and with KYA vs KDW [Grant Support: HL27137; HD71731;TRDRP: 23RT-0018].

## 56 UNIQUE NEONATAL TOLERANT RATS EXPOSED TO HYPEROXIA HAVE INCREASED BONE MARROW MONONUCLEAR CELL HEME OXYGENASE-1 LEVELS AND DECREASED ACUTE LUNG INJURY

K Repine\*, PV Wilson, D Pinto Payares, T Toni, B Florence, K Baer, Q He, A Fernandez-Bustamante, BW Saccomano, J Repine. University of Colorado Anschutz Medical Campus, Denver, CO

10.1136/jim-2017-000663.56

**Purpose of study** Hospitalised neonates and adults with hypoxemia are often given high oxygen concentrations (hyperoxia). The exact effects of administering hyperoxia are unknown; however, prolonged hyperoxia is associated with Bronchopulmonary Dysplasia (BPD) in neonates and Acute Respiratory Distress Syndrome (ARDS) in adults. We created a novel strain of hyperoxia tolerant rats by repeatedly breeding a single naturally hyperoxia tolerant rat and its tolerant offspring. Adult tolerant rats survive indefinitely while all adult control rats die in hyperoxia. Adult tolerant rats have higher alveolar macrophage precursor (bone marrow mononuclear cell {BMM}) levels of heme oxygenase-1 (HO-1)—an anti-inflammatory antioxidant—and develop less lung injury and inflammation (acute lung injury) than adult control rats after hyperoxia. Because of considerable interest in hyperoxia effects on neonates, we evaluated BMM HO-1 levels and acute lung injury in neonatal control and tolerant rats before and after hyperoxia.

**Methods used** Bone marrow from femurs of male neonatal (21-day-old) control and tolerant rats was harvested from unexposed and hyperoxia exposed (~52 hour) rats. BMM were counted and analysed (ELISA) for HO-1 expression. Acute lung injury (lung lavage LDH and protein levels) and lung inflammation (lung lavage neutrophils) were measured.

**Summary of results** After hyperoxia, neonatal tolerant rats have higher ( $p < 0.005$ ) BMM HO-1 levels and less LDH ( $p < 0.005$ ) and protein ( $p < 0.05$ ) but the same ( $p > 0.05$ ) neutrophils compared to neonatal control rats. Notably, pre-hyperoxia, neonatal control rats have higher ( $p < 0.05$ ) BMM HO-1 levels than neonatal tolerant rats; however, after hyperoxia, BMM HO-1 levels from neonatal control rats decrease ( $p < 0.005$ ) to below pre-hyperoxia baseline levels while BMM HO-1 levels of neonatal tolerant rats triple ( $p < 0.05$ ).

**Conclusions** BMM HO-1 levels of neonatal control rats do not increase following hyperoxia and are associated with increased acute lung injury. By comparison, neonatal tolerant rats have increased BMM HO-1 levels and reduced acute lung injury. BMM HO-1 increases may decrease lung injury in BPD related to hyperoxia treatment.

# 57 CONTINUOUS IGF1 PROTEIN INFUSION FOR 3 D DOES NOT HARM THE LUNG OR BRAIN OF MECHANICALLY VENTILATED PRETERM LAMBS

<sup>1</sup>M Dahl\*, <sup>2</sup>Z Zhou, <sup>2</sup>D Keefe, <sup>2</sup>JK Chung, <sup>2</sup>N Barton, <sup>1</sup>R Ward, <sup>1</sup>K Albertine. <sup>1</sup>University of Utah, Salt Lake City, UT; <sup>2</sup>Shire Pharmaceuticals, Lexington, MA

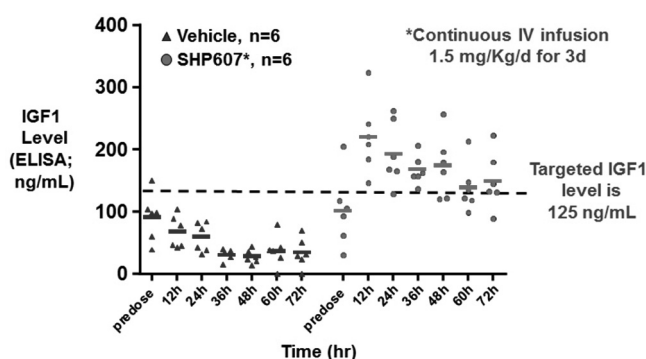
10.1136/jim-2017-000663.57

**Purpose of study** Insulin-like growth factor 1 (IGF1) protein level is low in preterm infants. Low IGF-1 level is related to bronchopulmonary dysplasia and its comorbidities. Whether repletion of plasma IGF1 will acutely affect lung and brain outcomes is unknown.

**Methods used** We measured plasma IGF1 protein level (ELISA; Mediagnost; Reutlinger, GER) for 3 groups. Group 1 was normal fetal lambs from 128 d (~28 w human) to term (~150 d), and term lambs to 150 d (~6 y human). Group 2 was preterm lambs managed by mechanical ventilation or non-invasive support. Group 3 was preterm MV lambs continuously infused with SHP607 (IGF1/BP3 complex; 1.5 mg/Kg/d) or vehicle (saline). Lung and brain tissue was collected at the end of 3 d.

**Summary of results** Plasma IGF1 protein level was low (~100 ng/mL) in normal fetal lambs and doubled postnatally (~220 ng/mL). IGF1 level was less in ventilated preterm lambs regardless of ventilation mode (not shown; similar to blue points in the figure 1; next). SHP607-treated preterm lambs (n=6) attained elevated plasma IGF1 level at the target of ~125 ng/mL. These lambs had slightly lower FiO<sub>2</sub> and PIP to maintain physiological oxygenation and ventilation targets, and slightly lower and more stable systemic hemodynamics, relative to vehicle (not significant, NS; n=6). SHP607 did not disrupt mRNA or protein abundance of apoptotic, proliferation, or vascular growth molecules in lung or brain. SHP607 also did not disrupt alveolar formation or capillary surface density in the lung, or grey/white matter ratio or capillary surface density in the brain, relative to vehicle (NS).

**Conclusions** SHP607 did not harm preterm lambs or injure their lungs or brain. SHP607 appears to lead to better systemic hemodynamics relative to its vehicle. HL110002, Shire.



**Abstract 57 Figure 1** Plasma levels of IGF1 protein are low in preterm lambs and reached target level (dashed line) during 72 h of continuous intravenous infusion of IGF1 complex

# 58 STRUCTURAL BRAIN DEVELOPMENT OF PRETERM LAMBS WITH BEHAVIOURAL DEFICITS

J Mabey\*, M Dahl, A Rebertisch, E Dawson, M Scadden, J King, J Anderson, K Albertine. University of Utah, Salt Lake City, UT

10.1136/jim-2017-000663.58

**Purpose of study** Realistic animal models of brain structure and development are crucial to understand mechanisms related to chronic brain injury associated with preterm birth. Few studies have used large-animal models associated with prematurity requiring respiratory support, and pathophysiological mechanisms for brain injury remain unclear. We performed longitudinal structural MRI imaging of the brains of normal term lambs and preterm lambs that had concurrent behavioural assessments.

**Methods used** Lambs were imaged at time points ranging from 1 week to 5 months of corrected postnatal age and included 84 MRI examinations in 43 normal term and 11 preterm, ventilated lambs. Imaging assessments were both T1 and T2 MRI images, stripped of skull and soft tissues, corrected for rotation and orientation, segmented into grey and white matter, and normalised to one term control lamb that served as an anatomic template. A linear mixed effects statistical model was used for evaluation of longitudinal differences in grey matter volume trajectory with age on both T1 and T2 images. Functional MRI and diffusion tensor imaging were also obtained.

**Summary of results** Grey matter volumes showed significant increases through a postnatal age of 2–3 months, the age when lambs wean from milk. No significant changes in grey matter volumes were observed between 3 and 5 months of age in any brain regions. T1/T2 ratios, typically related to brain myelination, did not show significant changes after 2 months. We found no brain regions showing significant differences in grey matter volumes through 5 months in preterm compared to term control lambs.

**Conclusions** Of the 11 preterm, ventilated lambs, 3 showed marked deficits in behavioural tests, including time to reach the milk-bottle reward for a maze test, and total time at a non-reflective surface for a mirror test. These 3 preterm lambs showed no differences in grey matter volumes in any region tested, overlapping with growth curves from both normal term and other preterm lambs without marked behavioural abnormality. Our findings suggest that behavioural deficits associated with preterm birth and ventilation are not associated with gross brain structural volumes, suggesting the need for analysis of white matter microstructure and functional brain activity to find pathophysiological mechanisms.

T35 HL07744, R01 HL110002

## Neonatology-general I

## Concurrent session

12:45 PM

Thursday, January 25, 2018

# 59 DETERMINATION OF RANGE OF MOVEMENT OF PERIPHERALLY INSERTED CENTRAL CATHETERS IN LOWER EXTREMITIES OF NEONATES BY ULTRASOUND

N Shalygin\*, J Kim. University of California San Diego, La Jolla, CA

10.1136/jim-2017-000663.59

**Purpose of study** Many neonates have a requirement for a peripherally inserted central catheter (PICC) to deliver total



parenteral nutrition, antibiotics, and/or other medications intravenously for prolonged periods of time. It is well known that PICCs migrate but what is not known is the amount of movement and what causes it. PICCs have been associated with a number of complications related to malpositioning including pleural effusion, arrhythmias, pericardial effusion, bleeding, spinal paralysis, steatohepatitis and death. We hypothesised that there is significant migration of the PICC tip in neonates and set out to quantify the degree of movement.

**Methods used** Neonates in the unit who had a leg PICC were scanned with ultrasound (US) either during or shortly prior to routine cares with either a GE Vivid E9 with ML6–15-D linear, GE Vivid-i with 12LS linear, or GE NextGen LOGIQ e with 10–22 L linear probes. The neonate was supine and with help had the lower extremity placed into several positions: leg completely straight, feet soles together with knees and hips fully flexed–‘frogleg position’, knee/hip at 90 degrees, and knee/hip flexed to the chest. Using the cavo-atrial junction as a reference point the distance from it to the line tip was measured using the software on the US machine during each respective position.

**Summary of results** A total of 14 neonates were scanned and we found that the STRAIGHT leg position pulled the line back farthest from the cavo-atrial junction in 100% of the subjects and KNEE-CHEST drove the line in closest to the junction in 65% of the subjects. Thus, the combination of these two positions represented the greatest range of movement in the majority of subjects. There was an overall increasing trend of the amount of migration based on weight at time of exam. On average the line moved 1.38 cm, the most movement was 3.76 cm.

**Conclusions** The results of this small observational study suggest that PICC lines are far from static in the neonate. There is indeed a considerable amount of migration based on how the neonate is positioned. This initial set of data helps to steer us in a certain direction in terms of standardising positioning for imaging confirmation of the PICCs using the STRAIGHT and KNEE-CHEST positions to evaluate entire range of the tip movement.

60

#### RESOURCE UTILISATION OF NEONATES WITH CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTION AND VENTILATOR ASSOCIATED PNEUMONIA IN THE UNITED STATES 2009 AND 2012

X Liu\*, A Song, S Nair, S Chin, T Lin, P Friedlich, A Lakshmanan. *Children's Hospital Los Angeles, Los Angeles, CA*

10.1136/jim-2017-000663.60

**Purpose of study** Central line-associated bloodstream infection (CLABSI) and ventilator associated pneumonia (VAP) are common types of hospital acquired infections that are associated with high morbidity. However, very little is known about resource utilisation for CLABSI and VAP in neonates. The main objective of the study is to determine the resource utilisation such as length of stay (LOS) and total hospital cost of neonates with CLABSI and/or VAP.

**Methods used** Retrospective data analysis was conducted on the Kid's Inpatient Database from the Healthcare Cost and Utilisation Project in 2009 and 2012. Neonates are classified as babies less than 28 days old, and cases with CLABSI and VAP were identified by ICD-9 diagnosis code (999.31 and

999.32 for CLABSI, 996.64 for VAP). Weighted variables were applied in the analysis for national estimates. Univariate analysis was completed to examine the resource utilisation patterns of CLABSI and VAP.

**Summary of results** 904 neonates with CLABSI and 279 neonates with VAP were identified. Among neonates who experienced CLABSI, 45.66% were white, 5.28% did not survive, and 72.62% were from non-children hospital. Among neonates who experienced VAP, 46.20% were white, 8.57% did not survive, and 77.44% were from non-children hospital. Median (IQR) LOS for CLABSI patients was 70 days (39–103), and median LOS for VAP patients was 99 days (70–132). CLABSI patients had a median total hospital cost of \$1 55 775 (IQR 89,056–270,093) versus \$2 39 427 (IQR 152,355–270,093) for VAP patients. The top 3 principal diagnoses for neonates with CLABSI were respiratory distress syndrome (5.90%), atresia and stenosis of small intestine (2.65%) and hypoplastic left heart syndrome (1.73%). The top 3 principal diagnoses for neonates with VAP were respiratory distress syndrome (6.58%), Acute bronchiolitis due to respiratory syncytial virus (RSV) (1.92%) and Patent ductus arteriosus (1.48%).

**Conclusions** CLABSI and VAP were associated with long LOS and high total hospital costs in neonates. Studies should be warranted to further improve CLABSI and VAP prevention and management in delivering care to high risk population.

61

#### THE EFFECT OF IN UTERO POLYSUBSTANCE EXPOSURE ON LENGTH OF STAY AND LENGTH OF PHARMACOLOGIC TREATMENT COMPARED WITH OPIOIDS ALONE

EE Johnson\*, K Schulte, J Seidel, J Shakib, K Buchi, C Fung. *University of Utah, Salt Lake City, UT*

10.1136/jim-2017-000663.61

**Purpose of study** Many studies have evaluated the efficacy of different inpatient treatment protocols on length of stay (LOS) in neonates with prenatal exposure to opioids but polysubstance is often excluded. In our institution, 77% of neonates who received neonatal withdrawal inventory (NWI) scoring had polysubstance exposure over opioids alone. We hypothesised that neonates with polysubstance exposure would have a prolonged overall LOS, LOS requiring pharmacologic treatment, and length of pharmacologic treatment (LOT) compared to opioids alone because of the synergistic disturbance on the CNS with multiple classes of drugs.

**Methods used** A retrospective review of 191 infants admitted to our NBICU or newborn nursery between 4/2015– 4/2017 who received any NWI scoring was completed. We collected maternal exposures, infant demographics (sex, gestational age, and others), overall LOS, LOS requiring pharmacologic treatment, and LOT. Substance exposures were categorised as: opioids alone, opioids+stimulant, opioids+cannabinoid or sedative or SSRI, opioids+≥2 drug classes, and non-opioid exposure. Iatrogenic withdrawal was excluded.

**Summary of results** A total of 142 infants met inclusion criteria. The overall LOS with the 15 infants exposed to opioids alone was 19.1±21.3 days, the LOS requiring morphine was 20.7±9.9 days, and LOT was 12.3±4.9 days. The opioids +stimulant group had the shortest overall LOS compared to the overall LOS with opioids alone (11.1±8.4 days, n=45,

$p < 0.05$ ). There was no statistical difference in LOS requiring morphine treatment nor in the LOT across all other exposure groups.

**Conclusions** Contrary to our hypothesis, we found no difference in overall LOS except for opioids+stimulant group which decreased overall LOS. We also found no difference in LOT, suggesting the overall decrease in LOS in the opioids+stimulant group may be due to other confounding factors such as unequal distribution of prematurity, high variability within other groups, and small sample size in opioids alone. Our data suggest that providers may anticipate a similar LOS in infants with polysubstance exposure who require pharmacologic treatment and may validate the reason for excluding polysubstance exposed infants in previous studies.

## 62 OUTCOMES FROM TREATMENT OF THE PATENT DUCTUS ARTERIOSUS IN VERY LOW BIRTH WEIGHT NEONATES

ED Rickards\*, P Jung, D Deming. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.62

**Purpose of study** We evaluated management approaches for patent ductus arteriosus (PDA) in very low birth weight infants and their long-term outcomes.

**Methods used** We performed a retrospective cohort study from January 2010 to July 2017 of neonates with a birth weight  $\leq 1500$  grams. We analysed the prevalence of bronchopulmonary dysplasia (BPD), necrotizing enterocolitis (NEC), retinopathy of prematurity (ROP), intraventricular haemorrhage (IVH), and periventricular leukomalacia (PVL). Descriptive statistics and chi-square p-values were calculated using SPSS, v22 (IBM).

**Summary of results** Of 689 neonates with a birth weight of  $913 \pm 271$  g (mean  $\pm$ SD), the prevalence of BPD and ROP was higher among infants who underwent ligation than those who received no treatment ( $p$ -value  $< 0.000$ ). The risk for BPD was increased by two-fold compared to ROP. Neonates who

received both indomethacin and ligation had a lower prevalence of IVH compared to those who received no treatment ( $p$ -value 0.002). The no treatment and indomethacin cohorts had a lower risk of PVL than the ligation group ( $p$ -value 0.015). No statistically significant findings were found in NEC outcomes.

**Conclusions** Neonates  $\leq 1500$  g who undergo ligation or indomethacin have an increased prevalence of BPD and ROP compared to those who receive no treatment. Surgical ligation of the PDA (with or without prior indomethacin) had a greater impact on this prevalence. Causation cannot be inferred in this small sample.

## 63 TIMING OF PATENT DUCTUS ARTERIOSUS LIGATION AND ASSOCIATED OUTCOMES

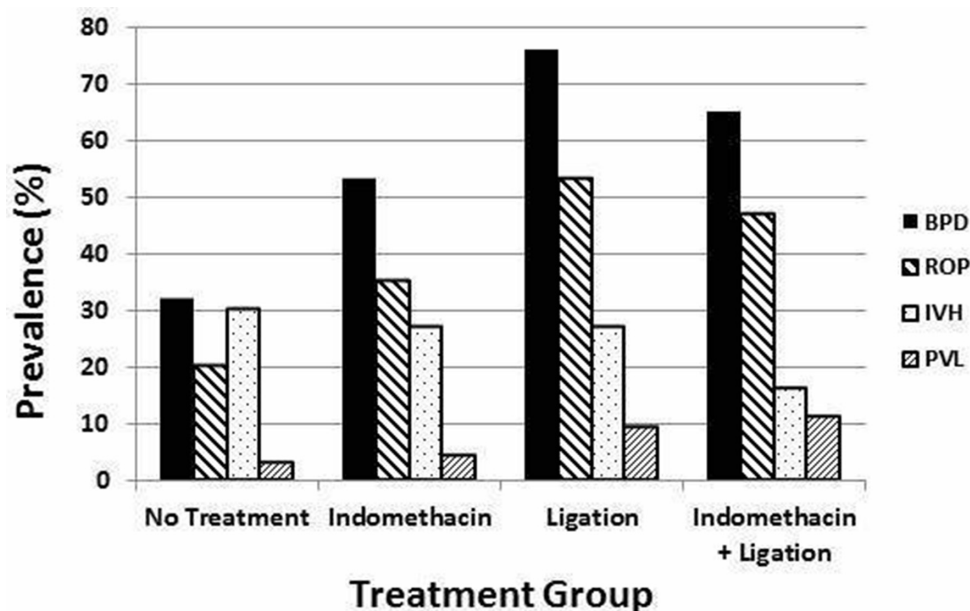
P Jung\*, ED Rickards, D Deming. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.63

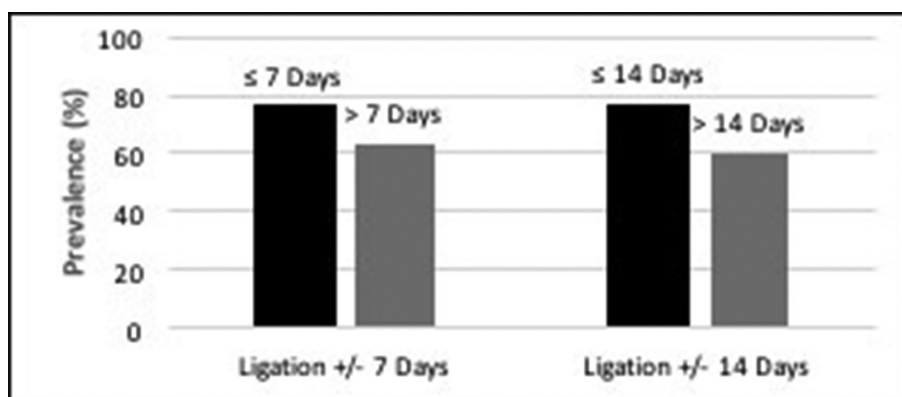
**Purpose of study** Surgical ligation for a patent ductus arteriosus (PDA) has been available for many decades, but the optimal timing for intervention remains to be determined. We evaluated whether early versus late ligation was associated with differences in long-term clinical outcomes.

**Methods used** We retrospectively reviewed charts of preterm infants admitted between January 2010 and July 2017 with birthweight  $\leq 1000$  grams. Interventions included ligation before and after 7 days of life and before and after 14 days of life. Outcomes measured were bronchopulmonary dysplasia (BPD), necrotizing enterocolitis, retinopathy of prematurity, intraventricular haemorrhage (IVH), periventricular leukomalacia, and death. SPSS v22 (IBM) was used for all statistical analysis and Chi-square testing was performed to determine significant alterations in distribution.

**Summary of results** There were 413 infants who met criteria for inclusion. 88 infants were ligated  $\leq 7$  days and 148 infants were ligated  $\leq 14$  days. Of all outcomes, only BPD was significantly different. Infants ligated within the first 7 days of life had a BPD



Abstract 62 Figure 1 Prevalence of outcomes by treatment types



**Abstract 63 Figure 1** PDA ligation timing and prevalence of BPD

prevalence of 76.1% compared to a prevalence of 63.1% when ligated after 7 days ( $p=0.022$ ). Infants ligated prior to 14 days had a BPD prevalence of 76.4% compared to a prevalence of 60.0% ( $p=0.001$ ) when ligated after 14 days. The overall prevalence of BPD in ligated infants was 65.9%.

**Conclusions** PDA ligation after 7–14 days of life is associated with a reduced prevalence of BPD. While ligation overall has been associated with increased BPD, delaying the procedure may help to reduce the prevalence. A possible explanation is that delayed intervention allows infants to grow and tolerate the procedure better. Alternatively, infants with delayed intervention may not be as critically ill as those who were ligated earlier.

64

#### PATENT DUCTUS ARTERIOSUS AND ASSOCIATED OUTCOMES IN EXTREMELY PRETERM INFANTS

P Jung\*, ED Rickards, D Deming. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.64

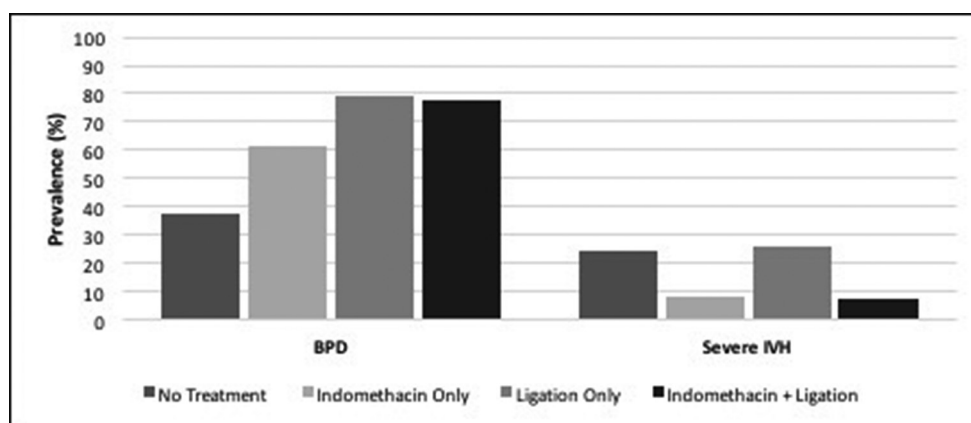
**Purpose of study** Management of a patent ductus arteriosus (PDA) remains challenging among premature infants. We evaluated the choice of intervention and associated long-term clinical outcomes.

**Methods used** We retrospectively reviewed charts of infants admitted between January 2010 and July 2017 with gestational age  $\leq 26$  weeks. Interventions included indomethacin

alone, surgical ligation alone, and indomethacin with later ligation. Outcomes measured were bronchopulmonary dysplasia (BPD), necrotizing enterocolitis, retinopathy of prematurity, intraventricular haemorrhage, and periventricular leukomalacia. SPSS v22 (IBM) was used for all statistical analysis and Chi-square testing was performed to determine significant alterations in distribution.

**Summary of results** Of 187 total infants, 158 received an intervention for the PDA. Prevalence of BPD was increased with ligation at 79.0% (alone) and 78.0% (with indomethacin) compared to indomethacin alone at 61.1% ( $p<0.001$ ). It was 37.9% in infants who did not receive any treatment. Severe IVH (grade 3 and 4) was decreased with any indomethacin at 8.3% (alone) and 7.3% (with ligation) compared to ligation alone at 25.9% ( $p=0.023$ ). It was 24.1% among infants who did not receive any treatment. No other outcomes were significantly associated with type of intervention.

**Conclusions** In our group of infants  $\leq 26$  weeks gestational age, PDA ligation (with or without indomethacin) has an increased association with BPD compared to those who received indomethacin only or no treatment. Whether ligation itself or another unknown factor is the cause cannot be determined. Severe IVH is decreased by indomethacin administration, irrespective of ligation status. This further suggests that it may be beneficial for the prevention of IVH, in particular those who may undergo later ligation. The mechanism may be independent of PDA closure as the trend continues in those with persistent patency.



**Abstract 64 Figure 1** PDA interventions and associated outcomes



# 65 GENTAMICIN USE IN THE FIRST TWO WEEKS OF LIFE IS ASSOCIATED WITH DELAYED CLOSURE OF PATENT DUCTUS ARTERIOSUS IN EXTREMELY LOW BIRTHWEIGHT INFANTS

P Shastry\*, B Siassi, R Ramanathan, R Cayabyab. USC/LAC+USC Neonatal-Perinatal Medicine Fellowship Program, Division of Neonatology, LAC+USC Medical Centre and Children's Hospital Los Angeles, Los Angeles, CA

10.1136/jim-2017-000663.65

**Purpose of study** Spontaneous closure of the patent ductus arteriosus (PDA) has been reported in 30% of extremely low birthweight (ELBW) infants. Both *in vitro* and *in vivo* studies have suggested that gentamicin mediates relaxation of the ductus arteriosus, inhibiting closure of the PDA. The objective of this study was to examine the association of gentamicin use within the first 2 weeks of life with patency and need for treatment of PDA in ELBW infants.

**Methods used** Retrospective review of electronic medical records of all ELBW infants admitted to the neonatal intensive care units at LAC+USC Medical Centre and Good Samaritan Hospital from 2002 to 2013. Echocardiograms were performed on all infants within the first 48 hours of life. Infants who had spontaneous closure or small PDA were classified as Group 1 and those infants with a hemodynamically significant PDA requiring medical or surgical treatment were classified as Group 2.

**Summary of results** A total of 402 patients were included in the study. Spontaneous closure of the PDA occurred in 221 (55%) of infants (group 1) and 181 (45%) infants were treated for PDA (group 2). There was no significant difference in maternal and neonatal demographics between the two groups (table 1). Treatment with gentamicin greater than 7 days was associated with 2-fold increase in the need for treatment of PDA (OR=1.9, 95% CI: 1.25 to 2.9; p value=0.003) after adjustment for confounders.

**Conclusions** Our data suggests that prolonged gentamicin use within the first 2 weeks of life may be associated with delayed closure of the PDA. This may be another reason for antibiotic stewardship in ELBW infants to improve outcomes.

Abstract 65 Table 1

	Group 1: spontaneous closure (n=221)	Group 2: treated (n=181)	p value
Birth Weight (grams)*	750 (640–869)	775 (645–870)	NS
Gestational Age (weeks)*	26 (25–27)	25 (24–27)	NS
Maternal Chorioamnionitis, n (%)	19 (8.6%)	24 (13%)	NS
Maternal Preeclampsia, n (%)	58 (26.2%)	52 (28.7%)	NS
Antenatal Steroids, n (%)	134 (60.6%)	111 (61.3%)	NS
Maternal Antibiotic use, n (%)	88 (40%)	76 (42%)	NS
Neonatal Gentamicin use, (days)*	6 (4–8)	7 (5–9)	0.0145
Neonatal Gentamicin use>7 days	28%	41%	0.004

\*median (25th–75th%)

n = number of patients, NS = non-significant

# 66 ASSOCIATION BETWEEN WEEKEND BIRTH AND NEONATAL OUTCOMES OF GOLDEN HOUR RESUSCITATION OF VERY LOW BIRTH WEIGHT INFANTS

<sup>1</sup>EH Carter\*, <sup>2</sup>H Lee, <sup>1</sup>W Lapcharoensap, <sup>2</sup>J Snowden. <sup>1</sup>Oregon Health and Science University, Portland, OR; <sup>2</sup>Stanford University, Palo Alto, CA

10.1136/jim-2017-000663.66

**Purpose of study** To characterise association between weekend deliveries and neonatal outcomes in the 'golden hour' after birth of very low birth weight (VLBW; <1500 g) infants.

**Methods used** This was a population-based cohort study using the California Perinatal Quality Care Collaborative data for all VLBW births from 2010–2016. Outcomes assessed as proxies for quality of golden hour resuscitation included: death within 12 hours, chest compressions, epinephrine, intubation prior to continuous positive airway pressure (CPAP), 5 min APGAR <4, and admission hypothermia. Cross-tabulation was used to assess unadjusted associations.

**Summary of results** Infants delivered on weekends were less likely to be prenatally diagnosed with intrauterine growth restriction, but were otherwise not significantly different in gestational age, ethnicity, sex, or maternal risk factors than those born during weekdays. Caesarean deliveries were less common on weekends (average 2862 weekday vs 2536 weekend) while vaginal deliveries were stable (average 1000) across all days. There was an association between weekend delivery and higher likelihood of chest compressions and lower 5 min APGAR, and a trend toward more epinephrine use (table 1).

**Conclusions** In the resuscitation of VLBW infants, there is an association between weekend delivery and increased rate of chest compressions and lower 5 min APGAR. This could suggest a likelihood of more frequent deviation from optimal golden hour resuscitations on the weekend as compared to resuscitations on weekdays, although future research should assess robustness of findings to cofounder control.

Abstract 66 Table 1 Unadjusted rates (%) of golden hour outcomes on weekends versus weekdays

	Overall	Weekday birth	Weekend birth	P
Death within 12 hours*	123 (0.6%)	87 (0.5%)	36 (0.6%)	0.482
Resuscitation	—	—	—	—
Chest compressions	1673 (6.3%)	1188 (6.1%)	485 (6.9%)	0.027
Epinephrine	907 (3.4%)	642 (3.3%)	265 (3.8%)	0.078
CPAP prior to intubation	12 951 (63.4%)	9452 (63.1%)	3499 (64.1%)	0.153
APGAR	2279 (8.6%)	1626 (8.4%)	653 (9.2%)	0.026
NICU admission temperature	—	—	—	0.818
Moderate to Severe hypothermia (<36.0)	3432 (12.9%)	2520 (13.0%)	912 (12.9%)	
Mild hypothermia (36.0–36.4)	5398 (20.4%)	3947 (20.3%)	1451 (20.1%)	
Normothermia (36.5–37.5)	16 267 (61.4%)	11 947 (61.5%)	392 (5.5%)	
Hyperthermia (>37.5)	1418 (5.4%)	1026 (5.3%)		

\*Infants born ≥25 weeks gestation

## Surgery I—plastic surgery

## Concurrent session

12:45 PM

Thursday, January 25, 2018

# 67 A CASE SERIES OF A HIGHER INCIDENCE OF DOWN SYNDROME IN PATIENTS WITH METOPIC CRANIOSYNOSTOSIS

C Zagaynov\*, I Campwala, A Ray. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.67

## Case report

**Introduction** The incidence of craniosynostosis ranges from 3.1 to 6.4 in 10 000 births. Specifically, metopic craniosynostosis affects 0.14 to 1.4 in 10 000 births. The current prevalence of Down syndrome is 1/700 births. While there is no conclusive association established between Down syndrome and metopic craniosynostosis, we have observed a higher incidence of patients with both conditions.

**Methods** A retrospective analysis of all patients with metopic craniosynostosis from 2006–2016 was conducted, and those with trisomy 21 were reviewed. Information regarding birth, development, pertinent health conditions, skull imaging, and corrective procedures were collected.



**Abstract 67 Figure 1** Anterior view of the skull with fused metopic suture of trisomy 21 patient

**Results** The charts of patients with metopic craniosynostosis reviewed spanned 10 years (2006–2010) and 3 patients with trisomy 21 were found. On average, our department performs 8 metopic craniosynostosis corrections per year. This produces an approximate incidence of 3/80 (3.75%). These patients exhibited a range of other medical conditions ranging from heart to nutritional problems. Figure 1 shows a CT head scan of the fused metopic suture of a patient. Patients underwent skull remodelling procedures.

**Conclusion** Given our high incidence of Down syndrome within our metopic craniosynostosis patient population, we suspect there may be a mechanistic or genetic connexion between them. Specifically, the abnormal structural development of the brain due to trisomy 21 may influence the premature closure of the metopic suture.

# 68 A COMPARISON OF SURGEON-REPORTED AND PATIENT-REPORTED OUTCOME MEASURES FOR BREAST RECONSTRUCTION SURGERY

<sup>1,2</sup>J Foley\*, <sup>1,2</sup>H Dreksler, <sup>1,2</sup>R Courtemanche, <sup>1,2</sup>M Bucevska, <sup>1,2</sup>D Courtemanche. <sup>1</sup>University of British Columbia, Comox, BC, Canada; <sup>2</sup>BC Children's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.68

**Purpose of study** Our study aimed to review surgeon-reported outcomes from published breast reconstructive articles in the literature over time, and determine the extent that surgeon outcome parameters overlap with the domains used in the BREAST-Q<sup>®</sup>, a patient-reported outcome measure (PROM).

**Methods used** Two authors (JF and HD) collectively reviewed all titles and abstracts, or full text, of all original articles related to breast surgery published in the Journal of Plastic and Reconstructive Surgery inclusive of 1946 to 2016 in 5 year intervals. Articles that did not report on surgical outcomes were excluded, with any uncertainty being resolved through consensus by discussion. Data collection included: year of publication, title, reported outcomes, and PROM tool use. Reported outcomes were categorised into the BREAST-Q<sup>®</sup> domains by comparing the similarity between the outcomes and the items within each domain.

**Summary of results** 341 articles met the inclusion criteria. A total of 131 unique outcomes and 40 PROM tools were identified. Since 2001, an average of 32% of articles utilised a PROM tool. 36 PROM tools were used in 48 articles, and of those, 11 used the BREAST-Q<sup>®</sup>. Of the 131 unique outcomes, 118 related to BREAST-Q<sup>®</sup> domains: physical well-being (47%), satisfaction with breasts (30%), satisfaction with care (8%), psychosocial well-being (8%), satisfaction with outcome (6%), and sexual well-being (1%).

**Conclusions** Our study supports the common criticism that breast surgery articles report on surgical complications and neglect reporting the patient perspective. Additionally, of the outcomes reported, the majority were related to the physical well-being and satisfaction domains. Given the unequal representation of the BREAST-Q<sup>®</sup> domains in outcome reporting, and the low level of PROM tool utilisation, further investigation is needed to delineate why surgeons choose to report certain outcomes would be valuable.

69

# A DISCONNECT BETWEEN THE FDA, PHYSICIANS, AND PATIENTS: AN ANALYSIS OF AESTHETIC DERMAL FILLER REGISTRATION TRIAL OUTCOMES

I Campwala\*, C Zagaynov, S Gupta. *Loma Linda University School of Medicine, Loma Linda, CA*

10.1136/jim-2017-000663.69

**Purpose of study** Outcome measurements in clinical trials have yet to be standardised, but we assume they aim to evaluate potential improvements in patient care and patient satisfaction. Recent reviews have found that clinical trials in a number of different specialties have had remarkably few measured patient-important outcomes, but instead use primarily surrogate outcomes. We sought to evaluate the outcomes measured in the United States Food and Drug Administration (FDA) registration trials of four popular aesthetic dermal fillers.

**Methods used** A review of clinical trials recorded by FDA registration documents for four popular aesthetic dermal fillers—Juvederm, Restylane, Radiesse, and Sculptra—was conducted. Primary and secondary outcomes reported were noted. A questionnaire asking survey participants to rank the importance of each of these outcomes (0=do not understand outcome, 1=not important, 5=very important) was administered to 11 physicians and 9 patients. Responses were compared to determine the difference in physician and patient-important outcomes and the inconsistencies between those ranked highly by our survey participants and those consistently measured as notable outcomes in FDA registration trials.

**Summary of results** Figures 1 and 2 display the top five and bottom five ranked outcomes for physicians and patients. Every physician marked ‘keloid formation at the site of injection’ with highest importance, while it was not seen in the top five for patients’ rankings. Adverse events and systemic toxicity were ranked highly by both groups.

**Conclusions** The inconsistencies between the outcome rankings highlights a disconnect between physicians and patients.

Top 5 Ranked Outcomes	Outcome	Average Score
	Wrinkle severity score	3.9
	Sub-chronic toxicity	3.8
	Adverse events	3.7
	Systemic toxicity	3.7
	Nodules/papules/lumps	3.3
Bottom 5 Ranked Outcomes	Pyrogenicity	1.9
	Anxiety/Depression	1.7
	Hemocompatibility	1.6
	Non-inferiority of the filler relative to control in terms of change from baseline	1.4
	Immunologic panel	1.3

Abstract 69 Figure 2 Outcome rankings for patients

Consistently low-scoring outcomes underscore a need for the FDA to focus on more patient-important outcomes in their registration trials.

70

# DOES TISSUE EXPANSION RECONSTRUCTION IN THE TRUNK OF CHILDREN INCREASE THE RISK OF SCOLIOSIS?

<sup>1,2</sup>PP Yen\*, <sup>1,2</sup>M Bucevska, <sup>1,2</sup>C Reilly, <sup>1,2</sup>C Verchere. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>BC Children's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.70

**Purpose of study** Two of our patients who had undergone truncal skin tissue expansion (TE) in early childhood subsequently presented with scoliosis. No report in the literature describes a case of scoliosis specifically related to a previous TE treatment. We hypothesise that truncal tissue expanders and subsequent flap surgery in paediatric patients, may affect

Top 5 Ranked Outcomes	Outcome	Average Score
	Keloid formation at the site of injection	5
	Dermal pigmentation at the site of injection	4.73
	Adverse events	4.73
	Systemic toxicity	4.64
	Number of treatment sessions needed to achieve optimal cosmesis	4.36
Bottom 5 Ranked Outcomes	Social Responsiveness Score	2.64
	Redness	2.64
	Itching	2.55
	Swelling	2.45
	Tenderness	2.36

Abstract 69 Figure 1 Outcome rankings for physicians



the tension, muscle balance, and alignment of the spine and trunk in such a way as to increase the risk of scoliosis. This study aims to investigate any relationship between TE and scoliosis, and to compare the prevalence of scoliosis in our study population to that of the general population (0.47%–5.2%).

**Methods used** Health records of patients who underwent TE at BCCH between 1997–2017 were retrospectively reviewed and analysed. The second (cross-sectional) part of the study consisted of radiological imaging, with or without a clinical examination of the spine, to establish the presence or absence of scoliosis. Presence of scoliosis was confirmed if the Cobb angle measured 10 degrees or more.

**Summary of results** We identified 28 patients who underwent truncl TE over the study period (7 male and 21 female). Median age at the start of TE was 5.5 years (range 0.3 to 17.8). 8 patients had a scoliosis series obtained previously or as a part of the study. The remaining 20 were either lost to follow-up, did not agree to imaging, or have their images pending. Of those imaged thus far, 2 study participants had been diagnosed with scoliosis in the past and 1 was diagnosed with scoliosis during this study, all after TE. The scoliosis has since been corrected in 2 cases (1 surgically and 1 self-corrected) and is still present in the third. The 3 cases represent a minimum lifetime incidence of at least 10.7% in our study population of patients with truncl TE.

**Conclusions** The knowledge gained from this and future studies will allow surgeons and families to make more informed decisions regarding treatment. We recommend that paediatric TE patients be made aware of the potential complication of scoliosis and be followed closely in the years during and after their treatment, in order to allow for preventative measures, early diagnosis and early management (if required).

## 71 FOUR YEAR BREAST RECONSTRUCTION MORBIDITY RATES IN AN ACADEMIC INSTITUTION

I Campwala\*, J Yoo, S Gupta. Loma Linda University School of Medicine, Loma Linda, CA

10.1136/jim-2017-000663.71

**Purpose of study** Breast cancer is the most diagnosed cancer and the second most common cause of death from cancer in the United States. A mastectomy is a standard treatment option for breast cancer and a growing percentage of women undergoing mastectomy elect to have a breast reconstruction. Reconstructive surgery provides psychological and functional benefits for women. As with any surgery, breast reconstruction has a risk of morbidities including seroma, hematoma, infection, and flap necrosis. In this study we aim to review the morbidities specific to our plastic surgery practice at Loma Linda University Medical Centre (LLUMC).

Category	Percentage
Minor Complications (wound dehiscence, allergic reaction, leukocytosis, fevers, diarrhea)	0.46%
Infection Managed Non-Operatively	1.03%
Return to the Operating Room	9.00%
<b>Overall Percentage of Morbidities</b>	<b>10.48%</b>
*total number of women who underwent breast reconstruction at LLUMC from Mar 2013 - Jan 2017 = 878	

**Abstract 71 Figure 1** Morbidity rates of patients who underwent breast reconstruction at Loma Linda university medical centre from March 2013 to January 2017

**Methods used** A retrospective analysis of our plastic surgery-specific morbidity and mortality electronic database was conducted from March 2013 to January 2017. Morbidities after breast reconstructive cases for patients with a history of breast cancer were catalogued. Patients were placed in three categories: those with minor complications, those whose infection was managed non-operatively, and those who had to return to the operating room.

**Summary of results** Figure 1 displays the percentage of patients who fell into each category of morbidity. There was a total of 878 patients with a history of a breast cancer who underwent breast reconstruction from March 2013 to January 2017.

**Conclusions** With the increasing popularity of breast reconstruction, a discussion of its morbidities has become more relevant. A previous analysis of overall surgical complications among all procedures within our practice found that the incidence of any complication was 1.89%. Our findings display a 5-fold relative rate of morbidities for breast reconstruction. This large incidence of morbidity calls for additional attention to risk prevention.

## 72 HIGH RISK PLASTIC SURGERY: AN ANALYSIS OF 54,325 CASES FROM THE AMERICAN COLLEGE OF SURGEONS NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM

<sup>1,2</sup>M Wan\*, <sup>1,2</sup>J Zhang, <sup>1</sup>M Nagarajan, <sup>1</sup>Y Ding, <sup>1,2</sup>M Bucevska, <sup>1,2</sup>D Courtemanche, <sup>1,2</sup>J Arneja. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>BC Children's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.72

**Purpose of study** Surgical complication rates are an important indicator of quality of care and decreasing these rates leads to substantial cost savings for health systems. The aim of this study is to investigate the most common 30 day complications in plastic surgery, identify the procedures at higher risk, and analyse clinical risk factors associated with these procedures.

**Methods used** A retrospective analysis of the 2012–2014 American College of Surgeons National Surgical Quality Improvement Program (NSQIP) plastic surgery dataset was conducted. Complication rates were calculated for the entire cohort and each procedure therein. Microsurgical procedures were analysed as a subgroup, where separate multivariate logistic regression models were used to determine risk factors for the development of surgical site infections (SSI), reoperation, and readmission.

**Summary of results** We identified 54 325 patients undergoing a plastic surgery procedure of which 6040 (11.12%) experienced any complication. Major complication rates were: reoperation at 3.50% (n=1,885), SSI at 3.08% (n=1,675), and readmission at 2.71% (n=1,477). Of all plastic surgery cases, 6.02%

were microsurgical (n=3,720), with a 27.58% (n=902) rate of any complication. Major complication rates were: reoperation at 12.87% (n=424), readmission at 5.87% (n=192), and SSI at 5.35% (n=175). Increased operative time, higher ASA class, and smoking were risk factors for SSI. Risk factors for reoperation include higher ASA class and higher BMI. Risk factors for readmission include increased operative time, presence of an open wound, and older age.

**Conclusions** The overall complication rate in plastic surgery remains relatively low. However, in microsurgery, there is a significantly higher rate of SSI, reoperation, and readmission. Risk factors for developing these complications include increased operative time and higher ASA class. This study helps to better inform surgeons with pre-operative counselling and provides them with risk factors for major complications.

### 73 LIPOSOMAL BUPIVACAINE AND POST-OPERATIVE NARCOTIC USAGE IN TISSUE EXPANDER BREAST RECONSTRUCTION

<sup>1</sup>D Sorta\*, <sup>1,2</sup>D Buchanan, <sup>1</sup>K Stime, <sup>1</sup>BA Hathaway. <sup>1</sup>University of Washington, Seattle, WA; <sup>2</sup>Spokane Plastic Surgeons, Spokane, WA

10.1136/jim-2017-000663.73

**Purpose of study** To evaluate postoperative narcotic use in patients undergoing tissue expander based breast reconstruction with the use of liposomal bupivacaine (LB), a lipid-based multivesicular drug delivery technology which releases local anaesthetic over an extended period of time.

**Methods used** IRB approval was obtained for a retrospective chart review of patients who underwent tissue expander based breast reconstruction by a single surgeon from November 2014 to September 2017. The study group included 62 patients and 108 reconstructed breasts. All reconstructions utilised acellular dermal matrix and both subpectoral and prepectoral techniques were included.

All patients received intraoperative infiltration of either 0.25% bupivacaine or liposomal bupivacaine. Post-operatively both total oral and IV narcotic use and oral and IV narcotic

use per hour in morphine milligram equivalents were analysed. Specific conversion factors applied to milligrams narcotic used are as follows: PO hydrocodone=1, PO oxycodone=1, PO hydromorphone=4, and IV hydromorphone=5.5.

Standard statistical t-tests were applied to compare the mean outcome variables between groups. Mean morphine equivalents of total oral and IV narcotic usage and oral and IV narcotic usage per hour between the two groups were compared. Statistically significant difference was considered at a *P* value less than or equal to 0.05 between groups.

**Summary of results** Total oral narcotic use was similar between the LB and non-LB groups. Total IV narcotic use showed a large discrepancy with 6.7 mg in the LB group and 16.1 mg in the non-LB group (*p*=0.062) although this finding did not reach the threshold for significance. Similarly, oral narcotic use per hour was comparable in the two groups while IV narcotic use per hour showed a statistically significant difference with 0.17 mg/hr in the LB group and 0.39 mg/hr in the non-LB group (*p*=0.046).

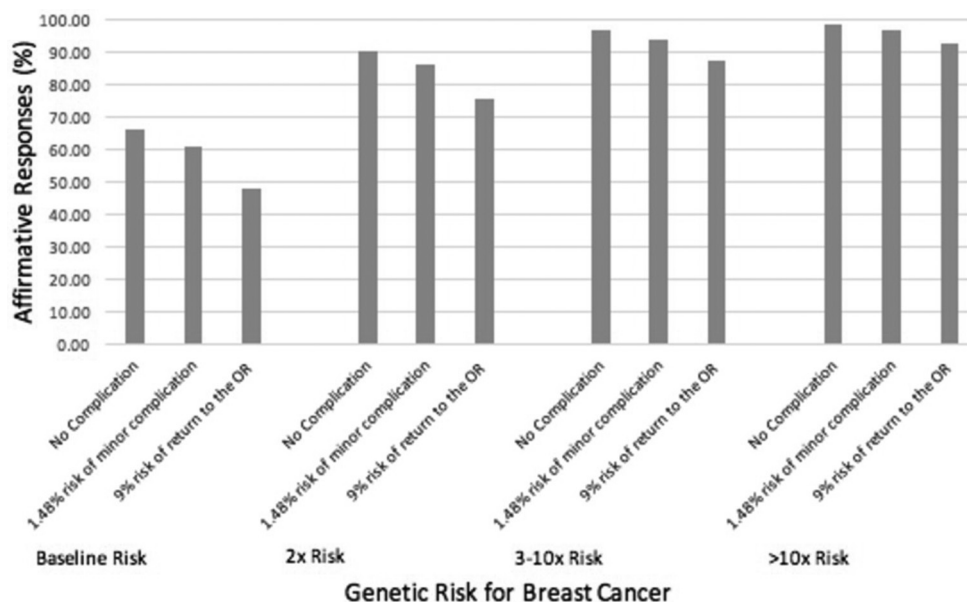
**Conclusions** In tissue expander breast reconstruction, while liposomal bupivacaine did not influence oral narcotic usage, there was a significant reduction in IV narcotic usage.

### 74 PERSONALISING DECISION MAKING FOR PATIENTS CHOOSING CONTRALATERAL PROPHYLACTIC MASTECTOMY: A UTILITY ANALYSIS OF GENETIC FACTORS AND THE RELATIVE RISK OF BREAST CANCER

J Yoo\*, I Campwala, S Gupta. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.74

**Purpose of study** There has been an increasing trend of women diagnosed with unilateral sporadic breast cancer electing to undergo contralateral prophylactic mastectomy (CPM) despite conclusive evidence of improvement in long-term survival for women without BRCA1/BRCA2 mutations. We aim to quantify the degree of genetic and surgical complication risks that lead women to justify CPM.



Abstract 74 Figure 1 Affirmative responses versus risk

**Methods used** 142 surveys were submitted by women. Figure 1 shows the percentage of women who would elect for a CPM, given tiered risks of morbidity and relative risk (RR) of developing contralateral breast cancer (CBC).

**Summary of results** Data analysis confirms predictions that over half the women would elect CPM under every scenario, except having to return to the operating room with a baseline risk of CBC. With an over 10 RR, 98.5% of women chose CPM if there were no surgical complications. From a baseline risk to an over 10 RR, there was a 3-fold decrease in change of affirmative responses versus increasing surgical morbidity rate. This illustrates that the surgical morbidity rate has less of an impact on the decision when women are at a high risk for CBC.

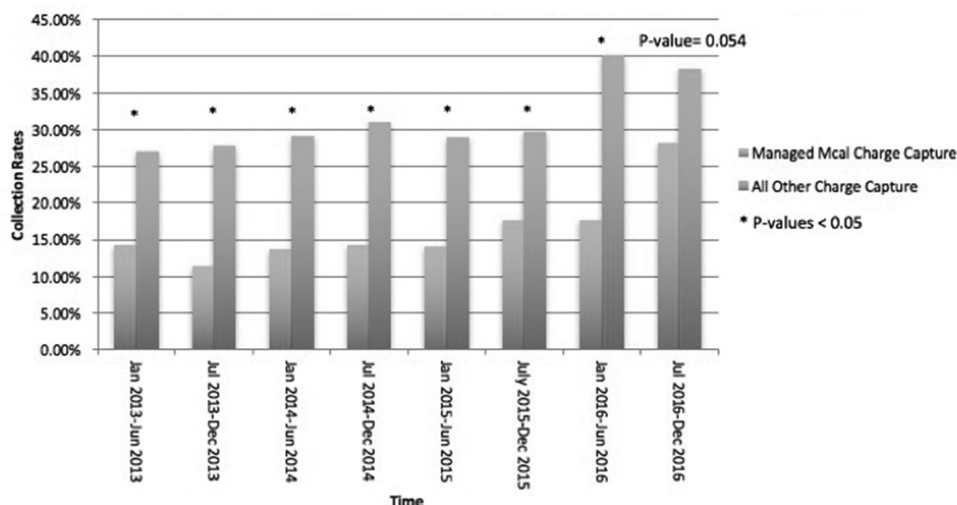
**Conclusions** At increased risk for contralateral breast cancer, women are likely to elect for contralateral prophylactic mastectomy. With growing knowledge of genetic mutations associated with breast cancer, this analysis predicts the decisions women might make given a specific genetic makeup. We anticipate that these findings will encourage the growing use of personalised medicine, with the potential to tailor breast cancer treatment plans for each patient's personal genetic profile.

## 75 SEVEN YEARS OF THE AFFORDABLE CARE ACT: FINALLY, A REIMBURSEMENT GLIMMER OF HOPE?

I Campwala\*, S Gupta. Loma Linda University School of Medicine, Loma Linda, CA

10.1136/jim-2017-000663.75

**Purpose of study** In previous studies, our eight-plastic-surgeon practice has found that the Affordable Care Act (ACA) has increased the percentage of insured plastic surgery patients; yet, collection rates for the local Managed Medi-Cal provider has been significantly lower than that of other insurance payors from 2013 to 2015—before and after the start of the ACA. An analysis of an individually contracted ACA health-care plan showed an increase in payment rates following the initiation of contracting in October 2015. This study seeks to quantitatively reevaluate the impact of the ACA on plastic surgery practice revenue one year post individual ACA benefit plan contracting.



**Abstract 75 Figure 1** Collection rate of managed MCAL and all other payment

**Methods used** Detailed plastic surgery billing information for January 2013 to December 2016 was collected. Collection rates of ACA insurors and other payors were calculated by dividing matched payments by charges. Collection rates were compared side-by-side in 6 month intervals using 1-tailed paired t-tests.

**Summary of results** From January 2013 through June 2016, Managed Medi-Cal charge capture had been significantly lower than that of all other insurance payors. However, the most recent 6 month interval from July 2016 to December 2016 showed an increase in Managed Medi-Cal collection rates (17% to 28%). (Figure 1).

**Conclusions** While ACA payor collection rates have remained significantly lower than that of their counterparts, the most recent data have shown that selective contracting has increased payments. Selective contracting has been a plastic surgeon's only tool to improve revenue collections in the age of the Affordable Care Act.

## Cardiovascular II—heart failure and transplant

### Concurrent session

3:15 PM

Thursday, January 25, 2018

## 76 IS FIRST-YEAR DSA AFTER HEART TRANSPLANTATION A BIOMARKER FOR CARDIAC ALLOGRAFT VASCULOPATHY?

J Olive\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.76

**Purpose of study** Donor-specific antibodies (DSA) after heart transplantation (HTx) have been correlated with development of cardiac allograft vasculopathy (CAV). DSA is seen in 10%–15% of HTx patients (pts) in the first year. We assessed whether first-year DSA correlates with CAV development at 3 and 5 years post-HTx at our single centre.



**Methods used** Between 2007–2012 we assessed 292 HTx pts–69 (23.6%) developed DSA in the first-year post-HTx. These pts were assessed for angiographic CAV at 3 and 5 years post-HTx. Pts were compared to a control group in the same era who did not develop DSA in the first year after HTx (n=223). Additional endpoints included 1 year survival, 1 year freedom from any-treated rejection (ATR), acute cellular rejection (ACR), antibody-mediated rejection (AMR), and biopsy-negative rejection (BNR), and 3 and 5 year freedom from non-fatal major adverse cardiac events (NF-MACE) [table 1].

**Summary of results** Pts who developed DSA in the first year post-HTx had significantly more ATR, ACR, and AMR in the first year compared to controls [table 1]. However, CAV at 3 and 5 years was comparable between the groups. Pts with persistent DSA (antibodies present  $\geq 2$  years) trended to develop more CAV at 3 and 5 years but this was not statistically significant. Survival and NF-MACE was similar between the two groups.

**Conclusions** Pts developing first-year DSA did not have a significant increase in development of CAV; however a larger cohort with extended follow-up is needed. First-year DSA does appear to be associated with increased risk of rejection. These pts should be targeted for more intense immunosuppression.

Abstract 76 Table 1

Endpoints	DSA in the first year post-HTx (n=69)	No DSA in the first-year post-HTx (n=223)	No DSA in the first-year post-HTx (n=223)
1 Year Survival	89.9%	89.2%	0.796
1 Year Freedom from Any-Treated Rejection	75.4%	90.1%	0.002
1 Year Freedom from Acute Cellular Rejection	85.5%	95.1%	0.011
1 Year Freedom from Antibody-Mediated Rejection	89.9%	98.7%	0.001
1 Year Freedom from Biopsy-Negative Rejection	89.9%	96.0%	0.068
3 Year Freedom from CAV	76.8%	74.0%	0.618
5 Year Freedom from CAV	72.5%	65.5%	0.293
3 Year Freedom from NF-MACE	85.5%	87.4%	0.753
5 Year Freedom from NF-MACE	85.5%	86.0%	0.956
NF-MACE: myocardial infarction, new heart failure, coronary intervention, implantable cardioverter defibrillator/pacemaker implant, stroke			
Endpoints	Persistent DSA (n=14)	Transient DSA (n=55)	P-value
3 Year Freedom from CAV	57.1%	75.0%	0.192
5 Year Freedom from CAV	50.0%	68.7%	0.175

recent exposure to illicit drugs may not demonstrate positive serology at time of donation due to short incubation period. Whether recent intravenous (IV) DA (cocaine, methamphetamine, morphine or opioids) portends worse outcome after HTx has not been determined. No policy exists regarding these donors for organ transplantation. We assessed outcomes after HTx of patients (pts) with extreme high-risk IVDA donors.

**Methods used** Between 2007–2014 we identified 45/518 HTx pts whose donors had IVDA within 2–4 weeks prior to declaration of brain death. Endpoints included 1 year survival, 3 year survival, 1 year freedom from any-treated rejection (ATR), 1 year freedom from acute cellular rejection (ACR), 1 year freedom from antibody-mediated rejection (AMR), 1 year freedom from infection, 3 year freedom from cardiac allograft vasculopathy (CAV) ( $\geq 30\%$  angiographic stenosis), and 3 year freedom from non-fatal major adverse cardiac events (NF-MACE) [table 1]. Incidence of primary graft dysfunction (PGD) was also assessed. This group was compared to pts who received non-high risk donors in the same era (n=473).

**Summary of results** All pts had negative serologies for HIV and hepatitis C at the time of transplant. There was no significant difference in PGD, first-yr infection, rejection, survival or 3 year freedom from CAV or NF-MACE relative to the control. No transmission of hepatitis C or HIV was detected in the first 3 months post-HTx by routine surveillance monitoring.

**Conclusions** Donors with recent illicit IVDA do not appear to be a contraindication to HTx. This will increase the donor pool and save lives.

Abstract 77 Table 1

Endpoints	Drug abuse donors (n=45)	Non-high risk donors (n=473)	P-value
1 Year Survival	93.3%	89.4%	0.413
3 Year Survival	86.7%	83.5%	0.681
1 Year Freedom from Any-Treated Rejection	86.1%	84.5%	0.969
1 Year Freedom from Acute Cellular Rejection	93.7%	93.3%	0.949
1 Year Freedom from Antibody-Mediated Rejection	93.3%	96.6%	0.289
1 Year Freedom from Infection	64.4%	55.6%	0.207
3 Year Freedom from CAV	86.7%	88.1%	0.733
3 Year Freedom from NF-MACE (myocardial infarction, new heart failure, coronary intervention, implantable cardioverter defibrillator/pacemaker implant, stroke).	95.6%	86.0%	0.087
Incidence of Primary Graft Dysfunction,%	4.4%	6.3%	1.000

77

#### USE OF NEEDLE IN THE ARM TYPE DONORS IN HEART TRANSPLANTATION: IS IT SAFE?

S Mersola\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.77

**Purpose of study** Drug abuse (DA) donors are deemed high risk in heart transplantation (HTx) due to risk of infection transmission, including HIV and hepatitis C. Donors with

78

#### EARLY VS LATE HLA ANTIBODY DEVELOPMENT AFTER HEART TRANSPLANTATION

J Davis\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.78

**Purpose of study** Development of antibodies (Abs) especially donor-specific Abs (DSA) following heart transplantation (HTx) impacts short and long-term outcome including

rejection, cardiac allograft vasculopathy (CAV), and survival. Ab class may be important with Class II Abs associated with CAV. The timing of Ab development (i.e. early or late) may also impact outcome. We sought to assess early vs late Ab development and the impact of Ab class on short and long-term outcome following HTx. Circulating Abs are drawn routinely in our program at 1,3,6,12 months post-HTx and annually thereafter.

**Methods used** Between 2010–2014 we identified 460 HTx patients (pts) at our centre. 89 developed DSA early ( $\leq 1$  year) and 42 late ( $>1$  year). Endpoints included 1 year survival, 1 year freedom from rejection and infection, 3 year freedom from CAV (defined by  $\geq 30\%$  angiographic stenosis), and 1 year freedom from non-fatal major adverse cardiac events (NF-MACE) [table 1].

**Summary of results** 1 year survival was comparable between pts with early vs late Ab development. Late Ab development led to significantly lower freedom from any-treated rejection ( $p=0.03$ ). There was a trend towards reduced freedom from acute cellular rejection in the late Ab group ( $p=0.083$ ). There was no difference in antibody-mediated rejection between the two groups. Late Abs had significantly lower freedom from both NF-MACE ( $p=0.004$ ) and CAV ( $p=0.012$ ). Late Class II Abs had significantly lower freedom from 3 year CAV ( $p=0.004$ ). NF-MACE was significantly higher in late Class I and Class II Abs.

**Conclusions** Late Ab development is associated with worse outcomes post-HTx. Late Class II Abs have an increased risk for CAV. Aggressive augmentation of immunosuppression (specifically switch to a proliferation signal inhibitor) may be valuable for these pts.

79

## PRE-TRANSPLANT NAÏVE VS MEMORY STATUS PREDICTS REJECTION RISK IN THE FIRST-YEAR AFTER HEART TRANSPLANTATION

JM Krems\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.79

**Purpose of study** Patients (pts) with prior transplants, blood transfusions, and pregnancies awaiting heart transplantation (HTx) have the potential to develop circulating anti-HLA antibodies (HLA Abs). However, not all pts in this at-risk population develop detectable HLA Abs. Pts at risk but who do not develop HLA Abs are termed ‘memory’ type pts because they have the potential to mount an Ab response. Those pts with no HLA Abs detected and have no risk factors are called ‘naïve’ pts. Whether naïve vs memory vs detected HLA Ab pts have an increased risk of rejection after the first yr has not been established.

**Methods used** Between 2010–2015 we assessed 502 HTx pts and divided them into naïve ( $n=199$ ), memory ( $n=156$ ), and detected HLA Ab pts ( $n=147$ ). Memory pts were defined as prior organ transplant, blood transfusion recipients and/or multiparous females without detectable HLA Abs. Endpoints included 2 year survival, development of DSA, 1 year freedom from any-treated rejection (ATR), 1 year freedom from acute cellular rejection (ACR), 1 year freedom from AMR, and 1 year freedom from biopsy-negative rejection (BNR).

**Summary of results** There was no difference in 2 year survival between the groups. Pts in the detected HLA Ab group had significantly reduced 2 year freedom from development of

Abstract 78 Table 1

Endpoints	Early antibody development (n=89)	Late antibody development (n=42)	Log rank p-value	Endpoints*	Early class I antibody development (n=24)	Late class I antibody development (n=3)	Log rank p-value	Endpoints*	Early class II antibody development (n=55)	Late class II antibody development (n=36)	Log rank p-value
Subsequent 1 Year Survival	92.1%	88.1%	0.359	Subsequent 1 Year Survival	100.0%	100.0%	1.000	Subsequent 1 Year Survival	87.3%	86.1%	0.717
Subsequent 1 Year Freedom from Any-Treated Rejection	70.8%	54.8%	0.030	Subsequent 1 Year Freedom from Any-Treated Rejection	87.5%	66.7%	0.251	Subsequent 1 Year Freedom from Any-Treated Rejection	63.6%	52.8%	0.172
Subsequent 1 Year Freedom from Acute Cellular Rejection	86.5%	76.2%	0.083	Subsequent 1 Year Freedom from Acute Cellular Rejection	91.7%	66.7%	0.099	Subsequent 1 Year Freedom from Acute Cellular Rejection	81.8%	77.8%	0.485
Subsequent 1 Year Freedom from Antibody-Mediated Rejection	86.5%	85.7%	0.816	Subsequent 1 Year Freedom from Antibody-Mediated Rejection	87.5%	100.0%	0.531	Subsequent 1 Year Freedom from Antibody-Mediated Rejection	87.3%	83.3%	0.518
Subsequent 1 Year Freedom from Infection	36.8%	21.4%	0.028	Subsequent 1 Year Freedom from Infection	47.8%	0.0%	0.182	Subsequent 1 Year Freedom from Infection	30.9%	25.0%	0.425
Subsequent 1 Year Freedom from NF-MACE	90.8%	73.2%	0.004	Subsequent 1 Year Freedom from NF-MACE	100.0%	66.7%	0.005	Subsequent 1 Year Freedom from NF-MACE	86.8%	69.4%	0.023
Subsequent 3 Year Freedom from CAV	86.5%	76.2%	0.012	Subsequent 3 Year Freedom from CAV	79.2%	100.0%	0.622	Subsequent 3 Year Freedom from CAV	90.0%	75.0%	0.004

\*Mixed Class I/Class II Antibodies excluded

## Abstracts

DSA vs the naïve group ( $p<0.001$ ). There was a numerical trend towards reduced 2 year freedom from DSA development in the memory group vs naïve pts ( $p=0.051$ ). The detected HLA Ab group had a significantly reduced 1 year freedom from AMR ( $p=0.003$ ). There was no significant difference in ACR or BNR between the groups.

**Conclusions** Memory pts and pts with detectable HLA Abs are at risk of developing DSA post-HTx. Pts with detected HLA Abs are also at high risk of developing AMR. These pts should receive intense immunosuppression to potentially reduce post-HTx rejection episodes.

Abstract 79 Table 1

Endpoints	Naïve (n=199)	Memory (n=156)	Detectable anti- HLA (n=147)	P- value
2 Year Survival	86.4%	87.3%	89.6%	0.660
2 Year Freedom from DSA Development	92.4%	84.3%*	77.7%**	0.001
1 Year Freedom from Any- Treated Rejection	82.5%	86.1%	80.5%	0.350
1 Year Freedom from Acute Cellular Rejection	90.4%	92.9%	95.5%	0.183
1 Year Freedom from Antibody- Mediated Rejection	98.0%	96.3%	89.9%	0.003
1 Year Freedom from Biopsy- Negative Rejection	92.2%	94.1%	92.9%	0.748

\* $p=0.051$  in comparison to Naïve patients \*\* $p<0.001$  in comparison to Naïve patients

## 80 CYTOMEGALOVIRUS MISMATCH IN HEART TRANSPLANTATION: THE IMPACT OF PROLIFERATION SIGNAL INHIBITORS

G Esmailian\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. *Cedars-Sinai Heart Institute, Los Angeles, CA*

10.1136/jim-2017-000663.80

**Purpose of study** Cytomegalovirus (CMV) mismatch (donor positive, recipient negative CMV serology) has been noted to increase the development of CMV infection in the first year after heart transplantation. There are many prophylactic regimens using valganciclovir in these patients. Despite having this prophylactic antibiotic, the natural history of CMV mismatch and the development of CMV infection is not clear. Furthermore, the use of proliferation signal inhibitors (PSIs) has been demonstrated to decrease the development of CMV infection by mechanisms not yet defined. However, the impact of PSIs on CMV infection in the immediate postoperative period has not been established.

**Methods used** Between 2010 and 2014 we assessed 96 heart transplant patients who had CMV mismatch on serology (D+R-). These patients were compared to patients who were either donor and recipient positive (D+R+, n=197), CMV recipient positive (D-R+, n=92), or naïve donors and recipients (D-R-, n=56). The usual prophylaxis for CMV positive donors and recipients was 6 months of valganciclovir therapy. CMV negative donor recipient pairs received acyclovir for 6 months. Patients who developed CMV infection were placed on a PSI and subsequent recurrence of infection was noted.

**Summary of results** Patients who had CMV mismatch had significantly less freedom from CMV infection in the first two years after heart transplantation compared to the other 3

groups. See table 1. Patients who were administered a PSI after CMV infection (n=20) had a 95.0% freedom from recurrence after one year.

**Conclusions** The natural history of patients with CMV mismatch with their donor (D+R-) suggests that the risk for CMV infection remains high after the 1 year prophylactic period. Switch to PSIs in patients with CMV mismatch appears to reduce recurrence of infection. Therefore, patients with CMV mismatch might be better treated with the application of a PSI initiated sometime in the first-year post transplant to prevent CMV infection.

Abstract 80 Table 1

Endpoints	CMV mismatch (D +R-), n=96	D+R+n=197	D-R +n=92	D-R- n=56	P- value
2 Year Freedom from CMV Infection	82.6%	95.3%	96.0%	98.0%	0.003
Endpoints	CMV Infection +PSI (n=20)	CMV Infection +No PSI (n=9)	P-Value		
Subsequent 1 Year Freedom from Recurrent CMV Infection	95.0%	100.0%	0.502		

## 81 PATHOLOGY ANTIBODY-MEDIATED REJECTION PLUS CIRCULATING DONOR-SPECIFIC ANTIBODIES INCREASE DEVELOPMENT OF CARDIAC ALLOGRAFT VASCULOPATHY AFTER HEART TRANSPLANTATION

N Lam\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. *Cedars-Sinai Medical Centre, Los Angeles, CA*

10.1136/jim-2017-000663.81

**Purpose of study** Several reports have correlated the development of donor-specific antibody (DSA) to the development of cardiac allograft vasculopathy (CAV) after heart transplantation (HTx). Interestingly, patients who develop pathology antibody-mediated rejection (pAMR) by EMB do not always have detectable DSA at the time of the rejection episode. It is not known whether the combination of pAMR plus DSA leads to a greater incidence of subsequent CAV. We sought to assess the impact of pAMR and DSA on the subsequent development of CAV by angiography at 3 years post-HTx.

**Methods used** Between 2010 and 2014 we assessed 400 HTx patients and divided them into those who did not develop pAMR or DSA (n=263), patients with pAMR alone (n=53), patients with DSA alone (n=53) and patients with pAMR and DSA (n=31). We analysed these groups for the development of 3 year CAV via angiography (per the ISHLT CAV grading scale). Additional endpoints included 3 year survival, and 3 year freedom from non-fatal major adverse cardiac events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, implantable cardioverter defibrillator/pacemaker implant, and stroke).

**Summary of results** There was no difference in survival between the four groups. There was significantly less freedom from 3 year angiographic CAV noted in patients with pAMR and DSA (87.1% vs 92.2% vs 92.5% vs 71.0%,  $p=0.043$ ).



Patients who had pAMR alone had similar outcomes in terms of angiographic CAV compared to patients without pAMR in the first-year post-transplant. Patients with DSA alone had similar outcomes compared to patients without DSA.

**Conclusions** It appears that DSA and pAMR combined increases the risk of CAV development in heart transplant patients. Therefore, when detectable DSA is present in addition to pAMR, a heightened immune regimen may be required.

**Abstract 81 Table 1**

Endpoints	No pAMR + No DSA (n=263)	pAMR alone (n=53)	DSA alone (n=53)	pAMR +DSA (n=31)	P- value
3 Year Survival	84.4%	84.6%	86.8%	87.1%	0.903
3 Year Freedom from CAV	87.1%	92.2%	92.5%	71.0%	0.043
3 Year Freedom from NF-MACE	89.0%	88.2%	88.7%	87.1%	0.999

## 82 OLDER KIDNEY DONORS IN COMBINED HEART-KIDNEY TRANSPLANTATION: HOW DO THEY STACK UP?

J Baker\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. *Cedars-Sinai Medical Centre, Los Angeles, CA*

10.1136/jim-2017-000663.82

**Purpose of study** Older kidney donors (OKDs) may have less renal reserve especially when compounded by donor cardiac arrest. Some OKDs may have additional risk factors for renal disease (ie hypertension or diabetes). Whether recipients with OKDs (>50 years old) are at greater risk for kidney failure or delayed graft function (DGF) following combined HKTx has not been established. We assessed renal function of patients (pts) with OKDs by assessing serum creatinine (Cr) and glomerular filtration rate (GFR) after HKTx.

**Methods used** Between 2008–2016 we identified 10/72 combined HKTx pts with OKDs (>50 years age). Endpoints assessed included Cr and GFR at 1, 3, 6, and 12 mths after HKTx, prevalence of DGF (defined by need for dialysis within 7 days of renal transplant), need for temporary (<1 mth) or chronic (≥1 mth) dialysis, and 1 year survival. Heart function was assessed to ensure adequate renal perfusion. All data were compared to a control HKTx group with heart-kidney donors <50 years age.

**Summary of results** 1 year survival was comparable between the two groups. HKTx with OKDs had increased DGF and reduced 1 year freedom from temporary dialysis, not statistically significant [table 1]. Cr and GFR at 1, 3, 6, and 12 mths after HKTx was similar between the two groups. 1 year ejection fraction was also equivalent between the two groups. **Conclusions** Pts with OKDs did well following HKTx. Kidney function appears comparable with donors <and> 50 years age.

**Abstract 82 Table 1**

Endpoints	HKTx donor>50 years (n=10)	HKTx donor<50 years (n=62)	P-value
Mean Donor Age, Years±SD	55.6±3.5	33.6±10.2	<0.001
1 Year Survival	90.0%	91.8%	0.816
Delayed Graft Function of Kidney,%	66.7%	42.4%	0.282
1 Year Freedom from Temporary Dialysis (<1 Month)	40.0%	61.3%	0.245
1 Year Freedom from Chronic Dialysis (≥1 Month)	100.0%	91.9%	0.365
Baseline Creatinine, Mean±SD	3.1±2.0	3.6±1.6	0.379
Baseline GFR, Mean±SD	33.4±34.5	20.1±8.8	0.012
1 Month Creatinine, Mean±SD	1.1±0.3	1.5±0.8	0.124
1 Month GFR, Mean±SD	79.0±48.4	62.1±28.1	0.119
3 Month Creatinine, Mean±SD	1.0±0.3	1.3±0.7	0.188
3 Month GFR, Mean±SD	73.0±21.8	67.3±25.2	0.502
6 Month Creatinine, Mean±SD	1.2±0.2	1.3±0.7	0.657
6 Month GFR, Mean±SD	61.0±13.2	78.3±76.6	0.481
12 Month Creatinine, Mean±SD	1.2±0.2	1.4±0.7	0.375
12 Month GFR, Mean±SD	58.4±12.8	61.2±19.5	0.663
Mean Baseline Ejection Fraction (%)	25.4%	34.0%	0.095
Mean 1 Year Ejection Fraction (%)	60.4%	61.9%	0.535

## 83 5-YEAR OUTCOME OF GFR WITH PATIENTS ON RENAL-SPARING PROTOCOL AFTER HEART TRANSPLANTATION

R Levine\*, S Dimbil, M Hamilton, J Kobashigawa. *Cedars-Sinai Medical Centre, Los Angeles, CA*

10.1136/jim-2017-000663.83

**Purpose of study** Calcineurin inhibitors (CNIs) such as cyclosporine and tacrolimus are known to cause chronic renal failure. As a result of this, programs have developed renal-sparing protocols (RSP) where CNIs have been replaced by a second anti-proliferative agent. The long-term success of RSP after heart transplantation is not well established. We sought to assess this question with a review of our patients 5 years after RSP initiation.

**Methods used** Between 1994 and 2012 we identified 71 heart transplant patients who were placed on the renal-sparing protocol. RSP was successfully achieved in 66.2% (47/71) of patients. These 47 patients were compared 2:1 to a control group matched for age, sex, and time from transplant to assess the efficacy of the RSP. We analysed subsequent five-year change in creatinine and GFR, and freedom from any-treated rejection.

**Summary of results** The average time to RSP initiation was 7.0 years. As expected, at RSP initiation, there was a higher creatinine and lower GFR in the RSP group compared to the control group (p<0.001). At 5 years post-RSP initiation there was no significant worsening of renal function of the RSP group compared to the control group. In the RSP group after 5 years, the creatinine actually improved (creatinine decreased

## Abstracts

from 2.3 to 1.8 mg/dl) and the GFR increased (33.7 to 43.1 cc/min, see table 1). There was no significant difference in subsequent 5 year freedom from any-treated rejection between the two groups ( $p=0.373$ ).

**Conclusions** The use of RSP appears to prevent a decline of kidney function by 5 years post-transplant.

Abstract 83 Table 1

Endpoints	RSP (n=47)	No RSP 2:1 (n=94)
Creatinine at RSP Initiation, Mean $\pm$ SD	2.3 $\pm$ 0.9	1.5 $\pm$ 0.7
GFR at RSP Initiation, Mean $\pm$ SD	33.7 $\pm$ 19.4	54.7 $\pm$ 20.2
Creatinine 5 Years Post RSP Initiation, Mean $\pm$ SD	1.8 $\pm$ 0.6	1.5 $\pm$ 0.4
GFR at 5 Years Post-RSP Initiation, Mean $\pm$ SD	43.1 $\pm$ 15.5	51.0 $\pm$ 15.0
$\Delta$ Creatinine 5 Years Post-RSP Initiation $\pm$ SD	-0.5 $\pm$ 0.3	0.0 $\pm$ 0.3
$\Delta$ GFR 5 Years Post-RSP Initiation $\pm$ SD	+9.4 $\pm$ 3.9	-3.7 $\pm$ 5.2
Subsequent 5 Year Freedom from Any-Treated Rejection	94.4%	97.9%

## 84 DOES ATG INDUCTION TRULY HAVE AN IMPACT ON SENSITISED PATIENTS AFTER HEART TRANSPLANTATION?

S Dimbil\*, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.84

**Purpose of study** Sensitised patients awaiting heart transplantation (HTx) are known to have poor outcome post-transplant but also are known to develop more donor-specific antibodies (DSA) particularly if anti-HLA antibodies were present prior to transplant. Some reports have suggested that the use of ATG induction will decrease the development of DSA in the first-year after HTx. Therefore, we wanted to assess whether the use of ATG for sensitised patients decreases the development of DSA in our single centre.

**Methods used** Between 2010 and 2016, we assessed 685 heart transplant patients and isolated those patients who were sensitised prior to transplant ( $PRA \geq 10\%$ ,  $n=217$ ). Patients were then divided into those that received ATG ( $n=162$ ) and those that did not ( $n=55$ ). Furthermore, we divided the patients who received ATG induction into those with ( $n=13$ ) and without ( $n=149$ ) pre-transplant DSA and analysed outcomes. Endpoints included 1 year freedom from DSA development, 1 year survival, 1 year freedom from any-treated rejection (ATR), acute cellular rejection (ACR), and antibody mediated rejection (AMR).

**Summary of results** Sensitised patients treated with ATG appear to have greater freedom from 1 year DSA development post-transplant compared to the no ATG group (86.4% vs 74.5%,  $p=0.038$ ). Between the ATG group and no ATG group, there was no difference in 1 year survival, any-treated rejection, acute cellular rejection, or antibody-mediated rejection (see table). Within the ATG group, the presence of pre-transplant DSA did not alter post-transplant *de novo* DSA development or outcome (see table 1).

**Conclusions** In sensitised patients, ATG induction appears to have benefit in reducing DSA development post-heart transplant.

Abstract 84 Table 1

Endpoints	ATG induction (n=162)	No ATG induction (n=55)	P-value
1 Year Survival	92.0%	85.5%	0.200
1 Year Freedom from DSA Development	86.4%	74.5%	0.038
1 Year Freedom from Any-Treated Rejection	84.0%	78.2%	0.425
1 Year Freedom from Acute Cellular Rejection	96.3%	94.5%	0.599
1 Year Freedom from Antibody-Mediated Rejection	88.9%	92.7%	0.379
Endpoints	Pre-transplant DSA + ATG induction (n=13)	No pre-transplant DSA + ATG induction (n=149)	P-value
1 Year Survival	100%	91.3%	0.265
1 Year Freedom from <i>de novo</i> DSA Development	61.5%	57.7%	0.798
1 Year Freedom from Any-Treated Rejection	76.9%	84.6%	0.665
1 Year Freedom from Acute Cellular Rejection	92.3%	96.0%	0.608
1 Year Freedom from Antibody-Mediated Rejection	84.6%	89.3%	0.769

## 85 LEFT MAIN STENTING AFTER HEART TRANSPLANTATION: WIDOW-MAKER?

TJ Davis\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. Cedars-Sinai Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.85

**Purpose of study** Cardiac allograft vasculopathy (CAV) is one of the major factors limiting long-term survival after HTx. The use of angioplasty and drug-eluting stents is common after HTx. The use of stenting for left main disease has not been well evaluated in this cohort of patients.

**Methods used** Between 2010 and 2015 we assessed 51 heart transplant patients who underwent stenting of the left main coronary artery post-transplant. These patients were subgrouped into those that had 1-vessel disease ( $n=29$ ) or 2 to 3 vessel disease ( $n=22$ ) in addition to the stented left main. Outcomes included subsequent 2 year survival, subsequent 2 year freedom from any myocardial infarction, and subsequent 2 year freedom from further deterioration in left ventricular function by echocardiogram.

**Summary of results** Left-main stenting was without restenosis in 80.4% of patients 1 year after heart transplantation. Patients with 2 to 3-vessel disease had numerically decreased 2 year survival but this was not statistically significant. There was no significant difference in subsequent 2 year freedom from myocardial infarction or further deterioration in left ventricular function between the two groups.

**Conclusions** Left main stenting appears to have acceptable outcome after heart transplantation. In addition, for these patients there does not appear to be worsening of outcome in patients with 2 to 3 vessel disease compared to patients with 1-vessel disease. Larger number of patients are needed to confirm these findings.

Abstract 85 Table 1

Endpoints	Left Main Stenting (n=51)		Log rank p-value
	1-vessel disease (n=29)	2 or 3-vessel disease (n=22)	
Subsequent 2 Year Survival	82.8%	71.4%	0.495
Subsequent 2 Year Freedom from Myocardial Infarction	86.2%	81.8%	0.699
Subsequent 2 Year Freedom from Further Deterioration in LV Function	69.0%	63.6%	0.847

## Community health I

## Concurrent session

3:15 PM

Thursday, January 25, 2018

### 86 TEACHING HEALTHY HABITS TO A DIVERSE POPULATION OF YOUTH BY USING INTERACTIVE DEMONSTRATION MODELS

SM Lee, MS Mayeda\*, D Leung, JS Chang, M Reddy, B Afghani. *University of California, Irvine, Irvine, CA*

10.1136/jim-2017-000663.86

**Purpose of study** The objective of this study was to evaluate the effectiveness of an interactive health exhibit in garnering the interest of youth in healthcare and science.

**Methods used** In 2011, the University of California, Irvine School of Medicine partnered with the Discovery Cube in Santa Ana, CA to bring a health education exhibit to the public. Initially the exhibit was established with only an intubation simulator. In 2013, a Smoking Lung model was added to teach about the dangers of smoking, and in 2016, a CPR model and supplemental smoking models were added. Pre-health students volunteered to teach about the respiratory system and demonstrate how physicians intubate patients using the human lung simulator. Children used deductive reasoning to classify a smoker's lung versus a healthy lung and were taught about the dangers of smoking using Mr. Gross Mouth, A Year's Worth of Tar, and Clem's Phlegm models. Surveys were distributed to assess the effectiveness of the program.

**Summary of results** The results from the 180 completed surveys are as follows. 33.5% were Asian, 22.3% Hispanic, 20.1%, Caucasian, 1.7% African American, 10.6% Mixed, and 11.7% reported multiple ethnicities. After completing the activities with the educational models, 79.9% of the respondents rated the hazards of smoking at 10 on a scale of 1 to 10 (10 being the most hazardous), and 92.7% indicated that they are less inclined to use substances harmful to the lungs. 60.4% reported that the Smoker Lung Model and the Tar in the Jar model were the most effective in showing the harmful effects of smoking. 52.0% reported that the exhibit encouraged them to enter a healthcare career while the rest did not report a change in their interest. 89.4% reported the exhibit

increased their interest in learning more about parts of the body. 87.2% indicated that CPR and smoking models should be included as part of their science courses and 89.4% would recommend our exhibit to their friends. 60.9% of the participants left positive comments and 39% left the comment section blank. A few participants asked for more interactive models.

**Conclusions** Our exhibit has been effective in reaching a diverse population of youth and has increased their interest in healthcare and science as well as expanded their knowledge on the hazards of smoking.

### 87 STIMULANT MISUSE AMONG COLLEGE STUDENTS IN THE UNITED STATES (U.S.): A LITERATURE REVIEW

<sup>1,2</sup>C Nikroo\*, <sup>2</sup>S Park, <sup>2</sup>R Nishi, <sup>2</sup>A Chang, <sup>2</sup>M Mohanakrishnan, <sup>2</sup>A Prabhu, <sup>2,3</sup>B Afghani. <sup>1</sup>University of Texas, Austin, TX; <sup>2</sup>University of California, Irvine, Irvine, CA; <sup>3</sup>CHOC Children's Hospital, Orange, CA

10.1136/jim-2017-000663.87

**Purpose of study** Illicit use and diversion of medications used to treat attention-deficit/hyperactivity disorder (ADHD) has been a public concern. The objective of this study is to identify the prevalence and characteristics of stimulant misuse among college students.

**Methods used** A comprehensive search was done using Pubmed, Google Scholar and review of reference lists. Studies published after year 2000 and performed at a U.S. college were included in the final analysis. We also included case reports that documented major side effects since they were not addressed in the larger studies.

**Summary of results** Eleven large studies that analysed misuse and 5 case reports were found. Majority of the studies were survey based and the sample size ranged from 98 to 21 771. Lifetime use among college students ranged from 5.5% to 35.5%. Past-year misuse of stimulants ranged from 4.1% to 10.6%, and appeared to have increased in recent years while nonmedical use of certain drugs, such as opioids decreased. In addition, recently, majority of college students reported using an amphetamine-dextroamphetamine combination agent (Adderall) compared to a methylphenidate product (e.g., Ritalin, Concerta, Metadate, Methylin). Misuse was more prevalent among students attending certain colleges and further among subgroups of college students; majority of misuse was among Caucasian males. Reasons given for misuse included improving concentration and academic performance, getting 'high', keeping awake, peer pressure, and losing weight (especially among females). Misusers were more likely to report illicit use of other drugs or alcohol, and the most common way of obtaining the medication was from a friend. Some side effects reported in large survey-based studies included: mood changes, addiction, loss of appetite and insomnia. Case reports of major side effects associated with misuse included: cardiac infarction, cardiomyopathy, psychosis and sudden death.

**Conclusions** Stimulant misuse continues to be prevalent among college students. It is imperative that healthcare professionals inquire and educate youth about stimulant misuse, and college counsellors increase youth awareness about the legal implications of diversion and potential side effects of misuse.



88

# REPORTED HEPATITIS C INFECTION IN AMERICAN INDIAN AND ALASKA NATIVE MOTHERS, 2011–2015

<sup>1</sup>J O'Malley\*, <sup>2</sup>S Seeman, <sup>2</sup>M Bruce, <sup>2</sup>D Bruden, <sup>2,3</sup>B McMahon, <sup>2</sup>L Nolen. <sup>1</sup>University of Washington, Anchorage, AK; <sup>2</sup>CDC, Anchorage, AK; <sup>3</sup>Alaska Native Tribal Health Consortium, Anchorage, AK

10.1136/jim-2017-000663.88

**Purpose of study** Despite an overall downward trend in infectious disease mortality in the United States, rates of hepatitis C virus (HCV) diagnosis and HCV-related deaths are on the rise. HCV can be transmitted at birth from mother to infant, which is of concern because HCV rates are rising for reproductive-aged women. CDC surveillance data suggests that American Indian and Alaska Native (AI/AN) individuals are at increased risk for HCV infection, however there are currently no studies that look at the prevalence of HCV infection in AI/AN mothers.

**Methods used** Data were analysed using birth records at the National Centre for Health Statistics (NCHS) from 2011 to 2015. These datasets contain records of every birth in the US, and include demographic and medical information on the mother and newborn. Multivariate analysis was conducted evaluating the relationship between HCV positivity, maternal age, education level, multiparity, smoking, initiation of prenatal care, as well as reported infection with Hepatitis B (HBV), gonorrhoea, and chlamydia.

**Summary of results** Of the 43647 AI/AN women who gave birth in 2015, 500 were HCV positive. Results of analysis show a rise in the reported cases of HCV, from 0.58% in 2011 to 1.13% in 2015 (CI: 0.53%–0.62% and 1.03%–1.23%). This is roughly three times the reported rate of HCV infection for the general population (0.21% in 2011, 0.37% in 2015). Tobacco use during pregnancy and HBV infection have the strongest correlation with HCV positivity. Teenage mothers were three times less likely to have HCV than older mothers.

**Conclusions** The rate of reported HCV infections has nearly doubled in AI/AN mothers between 2011 and 2015 and rate in AI/AN is increasing faster than the general population. This study is limited by lack of information on testing rates, which may affect the rate of detection of HCV between populations. Further studies are needed to address this. This investigation increases our understanding of which populations are at risk and which factors are associated with an increased risk, and can eventually impact screening, treatment and prevention.

89

# BLACKFEET SYRINGE EXCHANGE PROGRAM EXPANSION: PREVENTING HEPATITIS C TRANSMISSION THROUGH SAFE INJECTION PRACTICES

K Barth\*. University of Washington School of Medicine, Spokane, WA

10.1136/jim-2017-000663.89

**Purpose of study** The Blackfeet Reservation in Glacier County, MT is burdened with high rates of injection drug use and Hepatitis C (HCV); one in three infants born at Blackfeet Community Hospital have Neonatal Abstinence Syndrome, and 18% of mothers test positive for methamphetamines at delivery. There is no routine HCV screening among drug users. A small-scale syringe exchange program serves 30–40 people once weekly at a homeless shelter in Browning, the

reservation capitol, which does not meet the need locally or in outlying communities.

**Methods used** Through community interviews and meeting with tribal health organisations, four key obstacles to program utilisation were identified: lack of community awareness, lack of access, lack of resources, and stigma. A literature review was conducted to evaluate strategies for developing syringe exchanges in rural, under-resourced communities. Three key findings guided the expansion plan:

1. rural populations are best reached with mobile and satellite clinics,
2. point-of-care HCV testing is a feasible and effective way to recruit patients to treatment and reduce transmission, and
3. rural sites can overcome resource limitation by joining a resource sharing network.

**Summary of results** The syringe exchange expansion was initiated with development of a 'toolkit' of short and long-term goals, key resources, and advertisement materials. Delivery of the toolkit to the program director and several organisations recruited as new partners was well received. Implementation began with planning a second exchange site at the Heart Butte Clinic, which will increase geographic access and avoid the stigma of community recognition attending the shelter. A preliminary resource sharing network was established with the Fort Peck Reservation exchange, a consistent supply donor, and a physician and supplier for HCV treatment and testing.

**Conclusions** The project successfully increased awareness and generated support for syringe exchange among community leaders. By bringing together new partners and providing a framework and resources for growth, the expansion has a high likelihood of success. Going forward, the Blackfeet Syringe Exchange can serve as a model in a growing network of reservation-based harm reduction programs.

90

# DEVELOPING A CULTURALLY APPROPRIATE COMMUNITY HEALTH ASSESSMENT TOOL FOR THE SWINOMISH TRIBAL COMMUNITY

K Empe\*. University of Washington School of Medicine, Spokane, WA

10.1136/jim-2017-000663.90

**Purpose of study** The Swinomish Tribal Community includes about 970 Coast Salish people, most of whom live on the 7,500+acre reservation in Skagit County, WA. Due to its small size and the fact that non-tribal members live on the reservation, demographics of the community are hard to define and no formal needs assessment has previously been conducted. With the recent establishment of a tribally-run Community Health Department, one of the first steps is to perform a culturally appropriate community health assessment (CHA). Performing a CHA will help identify community needs and inform the direction of public health projects that will benefit the Swinomish Tribal Community.

**Methods used** Through conversations with community stakeholders and clinic staff, a partnership with the Community Health Department was established. It was determined that a CHA is needed to help identify issues important to the community. A literature review was performed to 1) research the development of culturally appropriate CHAs in tribal communities, 2) research strengths and weaknesses of tribal CHAs that have been performed elsewhere, and 3) assist in drafting

a CHA survey to be used to assess the needs of the Swinomish Tribal Community.

**Summary of results** The literature review included published CHA handbooks, methods for performing tribal CHAs, and completed tribal CHAs. These resources were compiled, annotated, and provided to the Community Health Department as a reference and resource. Based on this research, a preliminary CHA survey tool was created for future use by the Community Health Department.

**Conclusions** Performing a CHA is an integral part to implementing community-based public health projects. The tools and methods for a CHA in Native populations need to be developed with the culture of the population in mind, requiring some modifications to tools used for other demographic groups. Development of the survey tool is just one part of a complete CHA. Next, the preliminary survey tool will need to be evaluated and revised by a group of tribal advisors and then piloted with a small group of additional tribal members. From there, implementation strategy for a large-scale assessment will need to be developed, including recruitment of participants and data collection and processing. Funding for this project and its continuation has been provided in part by the NIH.

#### 91 THE ROLE OF RESOURCES AND HEALTH FAIRS IN UNDER-RESOURCED NEIGHBOURHOODS: A PILOT PROJECT IN WATTS, LOS ANGELES, CA

L Wright\*, C Gonzalez, R Charles. *Drew University of Medicine and Science, Westminster, CA*

10.1136/jim-2017-000663.91

**Purpose of study** Racial/ethnic health disparities are preventable differences in health outcomes between different races/ethnicities that are closely linked to social, economic, or environmental disadvantages. Geography continues to be a predictor of health disparities where infant mortality and chronic health outcomes appear to be intensified in high poverty tract areas in which African Americans and Latinos tend to live, compared to poor non-Hispanic whites. Watts is perpetually constructed as an under-resourced neighbourhood of Los Angeles where residents experience the poorest health. Resources and community health fairs have been identified as effective approaches to reach residents, ensuring health screenings, resource sharing, and gathering data. The primary objective of this study was to provide basic screenings and resources, while assess effectiveness of the fair and gather residents' health-related seeking behaviours to identify community-driven strategies to improve overall health.

**Methods used** Using community based participatory research, this study developed and administered a bilingual survey to capture residents' perspectives on the effectiveness of the fair, personal health seeking behaviours, and suggestions to improve health and wellbeing in the community. The surveys were de-identified and coded for frequency analysis of responses using the Statistical Analysis System (SAS).

**Summary of results** Of the 200 attendees, 107 completed the survey: 71 Latinos, 28 African Americans, 73 Females, 26 Males, 31 between the ages of 36–45, and 51 with a household income under \$15 000. Respondents determined their primary reason for attending was health screenings and identified transportation as a barrier to making their doctor's

appointment. The park and library were resources accessed the most, and community-driven recommendations included nutritional education and more health fairs.

**Conclusions** Resources and health fairs in low-income communities serve as immediate approaches for low-income and racial/ethnic minority populations. However, health fairs are not able to follow-up with most participants and may be inconsistent. Therefore, large-scale interventions should address limitations to ensure wellbeing in these areas.

#### 92 EVALUATING THE EFFECTIVENESS OF TELEPHONE COACHING ON MULTI-DISCIPLINARY TRAINEES AND COMMUNITY HEALTH WORKERS: A QUALITATIVE AND QUANTITATIVE STUDY

C Clarke, C Kwon\*, M Narita, V Vidales, M Baum, Z Lister. *Loma Linda University, Loma Linda, CA*

10.1136/jim-2017-000663.92

**Purpose of study** Telephone coaching has been proven to be an effective modality for promoting and sustaining healthful behaviour change. Few studies, however, show the effect of telephone coaching interventions on coaches and its effects on their personal behavioural change. This study sought to evaluate the effect that involvement in a summer telephone-coaching program for parents of obese youth had on knowledge, attitudes and behaviours of health coaches.

**Methods used** We conducted a study of physicians in training and community health workers at the end of a 5 week telephone coaching program. All coaches were provided with training prior to program involvement. Surveys were collected at the beginning of the program and focus group conducted at the program conclusion.

**Summary of results** Results identified key themes of patient motivation, health education and personal health practices. Participants identified strategies that could be implemented to enhance telephone-coaching interventions in a community based setting. Additionally, they reported increased knowledge and practice of healthful behaviours in their personal lives as a result of their participation in the telephone-coaching program.

**Conclusions** Our results suggest that involvement in telephone coaching to promote healthful behaviour change is a promising educational platform for multi-disciplinary team members and trainees.

#### 93 IMPLEMENTATION OF A DIABETES PREVENTION PROGRAM AMONG CITY EMPLOYEES IN RUPERT, IDAHO

D Griffin\*. *University of Washington, Moscow, ID*

10.1136/jim-2017-000663.93

**Purpose of study** The Rupert Employees Diabetes Prevention Program (DPP) is constructed to aid Rupert city employees who qualify as prediabetic develop healthier lifestyle habits to prevent or delay the onset of Type 2 Diabetes. The DPP is centred on a community-based approach to lifestyle changes such as healthier eating habits and increased physical activity. Rupert has over 65 employees and is the seat of Minidoka County in South-Central Idaho, which is home to over

20 000 residents. Minidoka County has a 34% obesity rate and a 10.8% diabetes rate, compared to Idaho's average rate of 28.6% obese and 8.1% diabetic. A need exists to educate community members about how to combat this disease. Research shows that lifestyle intervention is an effective and cost-friendly method of diabetes prevention from a societal and healthcare perspective, even more so than metformin prescription.

**Methods used** Community conversations exposed the high prevalence of diabetes in the area as a major concern. This concern was confirmed with clinical observations. A literature review lead to ideas for intervention, specifically implementation of a DPP. In partnership with the Recreation Manager and the South Central Public Health District Health Education Specialist, a plan was formulated to propose utilisation of a DPP targeting city employees to the Rupert City Council.

**Summary of results** The proposed DPP was presented at a Rupert City Council Meeting and received unanimous support from community leaders. The DPP will begin in September 2017 and will include interested city employees that qualify as prediabetic. The class will be funded with a wellness grant, taught by employees of the local University of Idaho Extension office, and will conveniently be held during work hours throughout the next year. The DPP will concomitantly address aspects of the wellness program already in place for city employees.

**Conclusions** The success of the DPP among Rupert City will ultimately be measured in the number of participants who follow through with the entire year-long program. However, because of the immense support from community members, established funding, and teaching resources, the favourable outcomes are promising. The next steps would be to expand the DPP to other public entities, such as the school district or hospital, to further allow community members to lead the fight against diabetes.

#### 94 USING GEOGRAPHIC INFORMATION SYSTEMS IN RURAL EMERGENCY MEDICAL SERVICES: REDUCING RESPONSE TIMES BY REALLOCATING RESOURCES

RB Liberg\*. *University of Washington, Spokane, WA*

10.1136/jim-2017-000663.94

**Purpose of study** This project addresses access to health care within a rural community. More specifically, access to emergency medical services was analysed due to the community's high level of outdoor recreation and traffic on a major thoroughfare, leading to a large number of emergencies responded to by the Ennis Ambulance Service that were located far outside of the Ennis city limits. The Ennis Ambulance Service is a volunteer-based EMS, covering an area of approximately 2000 square miles with just two EMS vehicles and a handful of active volunteers. The aforementioned limitations faced by many rural, volunteer-based EMS organisations has presented a challenge in maintaining quick response times to emergencies throughout the county. By reallocating ambulances to more strategic locations, it is predicted that response times to these rural emergencies can be reduced.

**Methods used** Locations of MVCs responded to by the Ennis Ambulance Service were plotted using ArcGIS software with the intention of identifying optimal locations for EMS vehicles in order to reduce response times. Data used in this analysis

included all MVCs responded to by the Ambulance Service from January 2015–August 2017.

**Summary of results** A geospatial analysis of MVCs responded to by the Ennis Ambulance Service was presented to the community partner. This included recommendations for optimal locations of EMS vehicles (one stationed in town and one stationed approximately 16 miles north in Norris, MT), as well as a visual distribution of MVCs within their service area, emphasising areas with highest MVC concentration. The community partner also received a literature review highlighting improvement of rural EMS through recruitment/retention efforts, importance of medical direction, improved educational outreach, and the use of GIS to better performance.

**Conclusions** Strengths of this proposed project include a tangible facility to relocate an ambulance. Challenges were gathering information and proposing change to an already under-resourced organisation. To implement the recommended allocation of EMS vehicles, the service must build, or locate, a facility to house their vehicle in Norris, MT. A financially feasible option that was discussed with the service was to establish an agreement with the fire department to use the Norris Fire Station to house their vehicle.

#### 95 EDUCATING THE COMMUNITY OF POWELL, WY ON DRUG TAKE-BACK PROGRAMS

K MacWhorter\*. *University of Washington, Spokane, WA*

10.1136/jim-2017-000663.95

**Purpose of study** A project designed to reduce misuse and abuse of prescriptions by increasing participation in the drug take-back program of Powell, WY.

**Methods used** Through conversations with local police officers and public health officials, it became clear that Powell, WY is facing a surge of opioid drug use and related crime. A drug take-back program exists at the local police department, but little effort has been made to disseminate knowledge of the program. A project proposal was made to increase community awareness of the program through development and distribution of an informational flyer. A literature search was completed to study the current means of prescription disposal and value of drug take-back programs. Following are several notable findings. 1) Only 1.4% of unused or expired prescriptions are brought to drug take-back sites, as compared to 54% disposed via garbage. 2) Another study determined that the main obstacle preventing proper prescription disposal is lack of information. 3) A major fact supporting the need for drug take-back: Of the individuals using opioid drugs in the 2000s nationally, 75% reported their first opioid was a prescription drug. To determine the content of the flyer, pharmacists, clinicians, and patients were polled on their understanding of the drug take-back program, questions they have, and obstacles to their participation in the program.

**Summary of results** An informational flyer on the drug-take program was developed and distributed at the local pharmacies to be placed in prescription bags, and in clinics. Pharmacists were made aware of the program through conversation and encouraged to promote the program. Additionally, the local newspaper wrote a story on the program and printed the flyer. Overall, patients who read the flyer were either hearing about it for the first time or surprised by the ease of its use.



**Conclusions** The effort to increase community awareness of the drug take-back program was successful through use of several avenues—flyer distribution, newspaper printing, and informational meetings with pharmacists. The effort will continue through a partnership with the Powell Police Department. To further increase community awareness, the information should be presented to clinicians at the local Powell Valley Healthcare all-staff meeting and broadcast on the local radio.

## Global health I

### Concurrent session

3:15 PM

Thursday, January 25, 2018

#### 96 CERVICAL CANCER PREVENTION IN RURAL HAITI: THE EXPERIENCE OF ONE HEALTH SERVICE ORGANISATION

<sup>1</sup>ED Rickards, <sup>1</sup>C Pearce\*, <sup>2</sup>L Lindenmeyr, <sup>3</sup>M Debay. <sup>1</sup>Loma Linda University, Loma Linda, CA; <sup>2</sup>Hispanola Health Partners, Salisbury, CT; <sup>3</sup>University of California, Riverside, Riverside, CA

10.1136/jim-2017-000663.96

**Purpose of study** Hispanola Health Partners (HHP), a US-based non-profit health services organisation, provides training and supplies to physicians and nurses to implement visual inspection using acetic acid (VIA) and the 'see and treat' method of cervical cancer prevention in 11 private and governmental clinics in rural southeast Haiti. This study examines the routine clinical data collected to assess the extent of the program's implementation, identify gaps in performance and formulate recommendations for improvement.

**Methods used** For every patient screened through the HHP program, information about patient demographics, sexual history, and risk factors along with screening results and follow-up recommendations was recorded for clinical purposes. This data was de-identified and transferred to a central database for secondary statistical analysis of patient demographics, screening results and follow-up. Program-wide and clinic-based results were reviewed.

**Summary of results** From July 2013 to March 2017, 1681 women were screened for cervical cancer. Patients screened ranged in age from 20–74 with an average age of 30. Median age of sexual debut was 18 years. Birth control information was reported for 1387 patients with 32% of those reporting use of some birth control method. Of the patients screened, 93 patients (6%) had a positive screen and 67 (4%) yielded inconclusive results. Follow-up care was recorded for 82 patients (88%) with positive screens. Of those, 49 (60%) underwent cryotherapy and 8 (10%) were referred for further treatment. A total of 32 (25%) patients with a positive or inconclusive screen were lost to follow-up.

**Conclusions** HHP successfully introduced and implemented a VIA and 'screen and treat' program in rural Haiti. Rates of positive VIA are similar to those noted in other programs in Haiti and abroad. However, a relatively high percentage of loss to follow-up is noted for patients with positive or inconclusive screens. Further exploration of the reasons for loss to follow-up may help the program to improve follow-up and treatment rates, and elucidate the main social and

environmental barriers to screening and follow up that women face in the region.

#### 97 A TRAIN-THE-TRAINER APPROACH TO MENTAL HEALTH COMMUNITY EDUCATION IN KISUMU, KENYA

K Lalonde\*, K Freeman, W Leung, J Wong, V Kapoor. University of British Columbia, Vancouver, BC, Canada

10.1136/jim-2017-000663.97

**Purpose of study** This project was designed to establish sustainability of mental health education workshops using a 'train-the-trainer' approach. As part of a multi-year initiative, collaborators from UBC and a community NGO, Kenya PCT, initially provided mental health workshops based on WHO modules to Community Health Workers (CHWs) in rural Kisumu, where there are varied perceptions of mental health and stigmatisation. They evaluated the effectiveness of knowledge transfer and found the majority of CHWs involved in this training improved their knowledge between pre- and post-test scores. In 2017, we assessed the utility of this training in the community and provided refresher training.

**Methods used** During this phase, CHWs were part of focus group discussions (FGDs) that allowed the team to assess retention from previous workshops, gain feedback and learn what tools CHWs would find helpful. CHWs were given refresher courses based on the previous workshops, as well as the opportunity to practice giving workshops.

Peer-teaching presentations to communities with CHWs and NGO staff demonstrated how workshops could be run, what tools were necessary and what knowledge was needed. Prior to conducting two educational workshops with five communities, FGDs were conducted to determine how mental health was perceived and understood. At the end of the workshops, our team asked a subset of questions to elicit what communities learned.

**Summary of results** Qualitative data from FGDs allowed the team to gauge their effectiveness in providing education. Our results show that key learning in the participating communities has occurred around understanding that mental illness is a medical concern, it can be treated and how to care for someone with mental illness. Those engaged in the process felt more confident with their knowledge and their ability to recognise mental illness. Further, CHWs retained knowledge from their previous teachings.

**Conclusions** Continuous education over the years has been successful and has provided a good foundation for mental health discussion in a culturally sensitive manner. Our partner NGO will continue to work with local providers to improve mental health treatment.

#### 98 WHAT'S HAPPENING AT THE FRONTLINE?: AN EVALUATION OF BEDSIDE MATERNAL CARE IN RURAL INDIA

<sup>1</sup>KA Bodily\*, <sup>1</sup>B Kemp, <sup>2</sup>R Chovatiya, <sup>2</sup>M Patel, <sup>1</sup>E Vandervort, <sup>1</sup>B Fassl. <sup>1</sup>University of Utah, Salt Lake City, UT; <sup>2</sup>Mota Fofalia Community Health Centre, Vadodra, India

10.1136/jim-2017-000663.98

**Purpose of study** In an effort to reduce maternal mortality (MM), India initiated one of the largest maternal health



programs worldwide in 2005. Despite a 29% increase in facility-based deliveries, India did not achieve a 75% reduction in MM. There is an urgent global need to ensure that facilities and birth attendants have the requisite skills, knowledge, supplies and systems to save lives. This study explored peripartum care practices to identify opportunities for quality improvement at a rural hospital in Gujarat, India.

**Methods used** This study took place at the Mota Fofalia Community Health Centre in Sinor Taluka, Gujarat. Maternal care practices were observed and compared to WHO care standards for seven weeks in June-August 2017. During this same period, 22 maternity charts from May 2017 were reviewed for care documentation, and 10 nurses completed self-assessment surveys in perceived capacity of basic emergency obstetric care.

**Summary of results** Nurses are the primary caregivers for normal peripartum care in this setting. Observations and chart reviews revealed that care does not currently adhere to WHO peripartum care standards. Chart reviews revealed 23% (5/22) of labouring mothers had blood pressure, less than 5% (1/22) had pulse, 45% (10/22) had fetal heart tones, and 0% (0/22) had temperatures recorded at any time during their care. Charting gaps were mirrored by observed practices for 23 deliveries. Numerous opportunities for improvement were revealed, while some care met WHO care standards. Of note: 100% (23/23) of women were accompanied during the first stage of labour and 100% (13/13) of women received uterotonics immediately after delivery.

Of the nurses who completed the aptitude survey: 70% were not confident in partograph use, 78% were uncomfortable with PPH management and 67% were not confident they could recognise signs of pre-eclampsia. No nurses were confident in shoulder dystocia recognition or management.

**Conclusions** This assessment identified significant gaps in knowledge and obstetric care delivery among frontline nurses in India. A series of interventions to improve care quality are highly recommended. Addressing the knowledge gap among frontline nurses is of the highest priority.

## 99 EDUCATIONAL OUTCOMES AMONG HEALTH WORKERS AFTER A MATERNAL-NEWBORN HEALTH TRAINING PROGRAM IN RURAL NEPAL: A STEP TOWARDS IMPROVING CARE QUALITY

<sup>1</sup>SE Schoenhals\*, <sup>2</sup>A Sherpa, <sup>1</sup>S Folsom, <sup>1</sup>A Chambers, <sup>1</sup>J Doane, <sup>1</sup>D Levy, <sup>1</sup>B Fassl. <sup>1</sup>University of Utah School of Medicine, Salt Lake City, UT; <sup>2</sup>Human Rights Peace and Development Forum of Nepal, Phaplu, Nepal

10.1136/jim-2017-000663.99

**Purpose of study** Access to skilled perinatal care is challenging in remote parts of Nepal. The majority of births occur at home and without trained providers, indicating the quality of care is suboptimal. Helping Babies Breathe (HBB), Essential Care for Every Baby (ECEB), Essential Care for Every Small Baby (ECSB) and Helping Mothers Survive (HMS) are evidence-based curricula designed to teach maternal-newborn care in low-resource settings. They focus on basic delivery skills, management of post-partum haemorrhage, neonatal resuscitation and newborn care with emphasis on low-birth weight babies. The purpose of this study was to evaluate the acquisition of knowledge and skills after completing these curricula, as part of a multi-faceted intervention aimed at creating access to quality maternal-newborn care in the Solukhumbu District of Nepal.

**Methods used** Between December 2015 and February 2017, four multi-day training sessions covering HMS, HBB, ECSB and ECEB modules were conducted for health workers in Solukhumbu. Trainings were facilitated by certified master trainers. Knowledge gain was assessed using a standardised, comprehensive multiple-choice test taken before and after the trainings. Skills acquisition was assessed by observed completion of skills checklists at the end of each module. A score of greater than 80% was considered sufficient to pass the skills competency requirements.

**Summary of results** A total of 35 health-workers from 8 remote health posts and 2 hospitals in Solukhumbu completed the training program. Following the training, knowledge scores increased from 79% to 91% for maternal care, from 76% to 95% for immediate newborn care, from 71% to 90% for essential newborn care, and from 63% to 91% for small baby care. Skills competency tests were completed by 16 participants. Of those assessed, there were 100% passing rates in HMS, HBB, ECEB, and ECSB modules.

**Conclusions** This training program improves health worker knowledge and skills in basic perinatal care. As part of a multi-step intervention, further evaluation including care assessments and refresher courses are needed to determine the long-term outcomes of this training.

100

## EARLY HEARING DETECTION AND INTERVENTION IN THE REPUBLIC OF PALAU: PROGRAM SUCCESSES AND CHALLENGES

<sup>1</sup>R Rahimian\*, <sup>2</sup>I Appanaitis. <sup>1</sup>University of Arizona, Tucson, AZ; <sup>2</sup>Republic of Palau—Ministry of Health, Koror, Palau

10.1136/jim-2017-000663.100

**Purpose of study** In the Republic of Palau, a remote Pacific island nation, hearing loss is a major cause of developmental delay in infants and carries its lasting effects into adulthood. Early detection and intervention is vital in recognising and preventing severity of disability. The Early Hearing Detection and Intervention (EHDI) uses the 1–3–6 time goals of hearing screening all newborns within one month of birth, to diagnosis of hearing deficit within three months of birth, and hearing health intervention within six months of birth for patients to reduce hearing loss deficits. The purpose of this study was to evaluate Palau's EHDI newborn screening program.

**Methods used** With Palau IRB approval, using information from the Ministry of Health-Policy and Research Development database, this evaluation investigated all newborns born in Palau between 2011 to 2013. A review of data from hospital and community health centre databases recorded demographics, the screening test date, diagnosis, interventions received by newborns, and follow-up visits.

**Summary of results** The Ministry of Health has screened 99.5% of newborns in 2011, 99.3% of newborns in 2012, and 98.7% of newborns in 2013. Of these children screened, 2% were referred to audiology in 2011, 2.2% were referred to audiology in 2012, and 3.5% were referred to audiology in 2013. Loss to follow-up was approximately 58% for those failing their initial screening and 100% for those receiving intervention. With no diagnostic audiology services available on-island, no true diagnoses were recorded for patients referred to audiology.

**Conclusions** Despite a very high screening rate that surpasses the United States, a lack of availability of referral services to an audiologist and intervention sees a high rate of loss to follow-up following a failed hearing screening. Palau is in the process of improving the hearing health system with the hiring of an on-island audiologist and arranging the health system to better triage patients requiring specialist care. Exploration of support and education services is necessary for comprehensive treatment. With the introduction of these services, it is estimated that loss to follow-up rates will be greatly diminished and more people will be able receive diagnosis and intervention in time to reduce hearing loss.

### 101 CREATIVELY ADDRESSING HEALTH EDUCATION IN SPITI VALLEY, INDIA

<sup>1,2</sup>MT Moor-Smith\*, <sup>1</sup>A Chang, <sup>1</sup>V Kapoor. <sup>1</sup>University of British Columbia, Victoria, BC, Canada; <sup>2</sup>University of Victoria, Victoria, BC, Canada

10.1136/jim-2017-000663.101

**Purpose of study** Health education is an important aspect of school-aged children's curriculum, especially in low-resource communities where treatment is often not sufficient or available. It is well established that health education is an important aspect of global health projects; however, this education is often delivered in a didactic manner. Previous research has shown that when knowledge is converted into a form that is meaningful to the learner, there is increased engagement, comprehension, and recall of the knowledge (*Creative KT: Ideas and Resources*, 2015). The goal of this project was to take key concepts surrounding health and hygiene and deliver these ideas in a way that was relevant to the student learners.

**Methods used** This issue was addressed through participatory action research—a method of research that emphasises community engagement. We collaborated with senior students to develop a film that promoted healthy behaviours that both students and researchers deemed important. Using a translator, we ran focus groups with primary-aged children before and after showing the film, to evaluate how effectively the film demonstrated key hygiene concepts.

**Summary of results** Focus groups were held with a random sample of primary-aged students prior to viewing the film. They were asked to describe, 'What is good hygiene?' and 'What keeps you healthy?' The responses revolved around diet, bathing, and brushing teeth. Following the film, the students could clearly communicate the three concepts demonstrated on screen: washing hands before eating and after using the toilet, brushing teeth at least once a day, and using the toilet properly.

**Conclusions** This project is an example of how involving the local community in health education can lead to beneficial outcomes and sustainable hygiene resources. It promotes the idea of using creative methods of knowledge translation in global health projects as a suitable alternative to the traditional workshop format. With more positive data, it is our hope that health education projects in the future will use creative methods to deliver key health promotion messages, thereby leading to better comprehension, retention, and long-term health outcomes for the children involved.

### 102 COMMUNITY EDUCATION ABOUT BURKITT LYMPHOMA (BL) IN UGANDA

CA Stiggelbout\*. University of Washington, Seattle, WA

10.1136/jim-2017-000663.102

**Purpose of study** BL is an aggressive lymphoma that is endemic to sub-Saharan Africa, representing a significant proportion of childhood cancers in the region. While high-income countries have a 90% cure rate for BL, patients in low-income countries survive only 48% to 67% of the time. Most BL patients in Uganda present with advanced stage disease, which contributes to their poor treatment outcomes. Identifying ways to improve early diagnosis of disease could improve these outcomes. The goal of this project is to increase community awareness about BL, which will address one of the many factors contributing to late diagnosis of the disease.

**Methods used** Observation on clinical units at the Uganda Cancer Institute (UCI) and discussions with UCI healthcare workers and patient families were used to identify healthcare related and patient related causes for late diagnosis of BL. To supplement this work, a literature review was conducted to identify studies on BL diagnosis in sub-Saharan Africa. The BL team and the Comprehensive Community Cancer Program (CCCCP) at UCI helped to develop a message and poster that focused on BL signs and symptoms, and how to respond appropriately in the Uganda. Delivering the message to faith-based institutions in rural central Uganda was sensible and practical for this project because the prevalence of BL is greater in rural areas, and faith-based institutions represent an already mobilised group of people.

**Summary of results** The BL educational talk was delivered to 4 faith-based institutions in rural central Uganda over a period of 2 weeks, reaching approximately 400 people. Audiences demonstrated keen interest in the information and asked many questions about BL and about cancer in general (about 1 question/2 people when time was not a limiting factor).

**Conclusions** This project increased awareness about BL and how to respond in Uganda, and provided an important first step in mobilising the community to learn about such health issues. With the information gained from this project, the UCI can now work to improve and expand the program by reusing the posters at other CCCC outreach events and delivering the message to other rural districts across Uganda.

### 103 EXPLORING THE FEASIBILITY OF MENSTRUAL PRODUCTS AND EDUCATION PROGRAMS FOR MENSTRUAL HYGIENE MANAGEMENT IN A REMOTE HIMALAYAN COMMUNITY IN INDIA

R Shankar\*, T Gao, S Riedlinger, V Kapoor. University of British Columbia, Vancouver, BC, Canada

10.1136/jim-2017-000663.103

**Purpose of study** Remote Himalayan communities suffer from an absence of menstrual hygiene education programs and a significant lack of access to menstrual products. This project delivered reproductive health and menstrual hygiene workshops to female students at Munsel'ling Boarding School in Spiti, India. A qualitative research study was also piloted to

understand menstrual product preference based on personal, cultural and geographic factors.

**Methods used** To create a safe and inclusive space to discuss intimate women's health issues, two interactive workshops were offered to female students aged 11+. These workshops discussed physiological changes in puberty, basic female/male reproductive anatomy, reproductive health and menstrual hygiene. At each workshop, students had an opportunity to ask questions anonymously through a question box. All workshops were offered in English, Hindi and Bhoti to ensure comprehension. To explore the feasibility of reusable menstrual cups and pads as sustainable options for menstrual hygiene management, a 12 month research study was started. Students who had begun menses, were aged 14+, and had attended the workshops were invited to participate. Each participant was provided with one menstrual cup and cleaning supplies, four reusable pads and one menstruation diary. Training on proper usage was provided for each product. Students were asked to document their menstrual product choice(s), their rationale for their choice and their experience after each period in their diary.

**Summary of results** Ninety-four percent of students invited to the workshops attended at least 1 workshop. All eligible students participated in the study. The mean age of participants in the study is 15.4. Data from the menstruation diaries will be recorded once a month for all 12 months of the study.

**Conclusions** The attendance of the workshops confirmed the interest, curiosity and need for menstrual education programs in remote Himalayan communities. The pilot study conducted over the next 12 months will collect data regarding menstrual product preference in this vulnerable community. The project represents a step towards creating an open dialogue on menstruation and women's health issues, while ensuring options are tailored to the local climate and sanitation infrastructure.

#### 104 DEVELOPING EFFECTIVE TEACHING MATERIALS FOR PESTICIDE SAFETY EDUCATION FOR FARMING COMMUNITIES IN RURAL NEPAL

CA Broomhead\*. University of Washington, Seattle, WA

10.1136/jim-2017-000663.104

**Purpose of study** 50% of pesticides used in Nepal are classified as 'moderately hazardous' and 15% as 'highly hazardous'. Since 83% of Nepal's population is directly involved in agriculture and the majority of farmers use insufficient or no personal protective equipment (PPE), a large portion of the total population is at risk for harmful health outcomes due to pesticide exposure. The objectives of this project were to improve knowledge of PPE importance and to decrease harmful health outcomes through its use.

**Methods used** Assessment of the local trends in pesticide use was done through literature review of region-specific studies, health reports, and interviews with local public health specialists. The intervention was developed based on observation of a 3 day training using the existing curriculum. Specific guidelines identified for use in developing materials were those focused on low-resource settings that were also deemed appropriate by in-country health officers. Input on how to make materials region-specific and culturally relevant, translation from English to Nepali, and public health expertise were provided by in-country Community Health Department partners.

**Summary of results** Three educational posters were developed, depicting harmful health outcomes related to pesticide use, proper donning of personal protective equipment, and proper removal and cleaning of personal protective equipment. In addition, 6 pages on personal protective equipment were added to a local training manual called *Prevention of Pesticides Related Health Effects through Education*. Finally, an interactive activity was designed for learners to practice removing personal protective equipment. These materials will be used by my Nepali partners to train 100 local farmers, who will subsequently train their colleagues, with up to 1400 beneficiaries by early 2018. Local public health partners have expressed their satisfaction with the quality and potential effectiveness of the developed materials.

**Conclusions** Proposed materials were successfully developed to be used to promote the importance and proper use of personal protective equipment when using pesticides. Assessment of their efficacy has yet to be determined, but in-country partners who are using these materials will later determine their impact.

#### 105 ANAEMIA PREVALENCE AND RISK FACTORS IN WOMEN OF REPRODUCTIVE AGE IN RURAL VILLAGES OF GUJARAT, INDIA

<sup>1</sup>A Engle\*, <sup>1</sup>J Hansen, <sup>2</sup>P Brahmabhatt, <sup>3</sup>KA Bodily, <sup>2</sup>M Patel, <sup>1</sup>B Fassl. <sup>1</sup>University of Utah School of Medicine, Salt Lake City, UT; <sup>2</sup>University of Utah, Salt Lake City, UT; <sup>3</sup>University of Utah College of Nursing, Salt Lake City, UT

10.1136/jim-2017-000663.105

**Purpose of study** Anaemia is a major concern in pregnant women world-wide as it is known to be associated with higher maternal mortality rates, lower infant birth weights, and worse developmental outcomes in children. Anaemia is known to be an issue in India. However, information is currently lacking on the prevalence of anaemia in rural India, and specifically in the state of Gujarat. The objective of our study was: To approximate the prevalence of anaemia in women of reproductive age in rural Gujarat and to determine nutritional factors, understanding of anaemia, and prenatal vitamin (PNV) supplementation.

**Methods used** The study took place in rural Gujarat, India in the Sinor area from 5/21/17–7/9/17 and included all women of reproductive age (15–45 years). Women were recruited randomly as a convenient sample in the local community hospital and during community health worker field visits. We used the Masimo Pronto device to measure Hgb and conducted a structured interview regarding diet, PNV use, and general understanding of anaemia.

**Summary of results** 46 measurements were obtained. Average age of participants was 25 (SD=5.49). Average Hgb values were 12.22 g/dL (SD=1.24) overall. Average Hgb was 11.9 g/dL (SD=1.21) for pregnant women (n=23), 12.45 g/dL (SD=1.24) for non-pregnant women (n=21), and 13.4 g/dL (SD=0.85) for women who recently delivered (n=2). 2/23 (8.7%) pregnant women, 4/21 (19%) non-pregnant women, and 0 recently-delivered women were found to be anaemic. 27/46 (58.7%) reported daily PNV use during their most recent pregnancy. 3/46 (4.35%) and 13/46 (28.3%) reported having some understanding of anaemia and indication for PNV, respectively. 0 reported making any dietary changes during pregnancy. 45.7%, 97.8%, 97.8%, and 63.0% reported



high amounts (>1 x/week) of meats, legumes, vegetables, and fruits, respectively.

**Conclusions** Overall, anaemia prevalence among women of reproductive age in rural Gujarat is low. Women report high amounts of iron-rich foods in their diet and deny any dietary changes with their pregnancies. Most women report PNV use during pregnancy, although few report an understanding of the indication.

## Haematology and oncology I

### Concurrent session

3:15 PM

Thursday, January 25, 2018

#### 106 CRISPR-CAS9 EPIGENOME EDITING TO INDUCE DNA DEMETHYLATION AT P14ARF PROMOTER AND INHIBIT SKIN CANCER

JW Lee\*, D Rokunohe, M Kawasumi. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-2017-000663.106

**Purpose of study** The p16<sup>INK4A</sup> and p14<sup>ARF</sup> tumor suppressor genes function as cell cycle regulators and play an important role in tumour growth and metastasis. These two genes are frequently inactivated in skin cancers, mainly due to promoter methylation of p16<sup>INK4A</sup> and p14<sup>ARF</sup> rather than gene deletion or loss-of-function mutations. This DNA methylation is of therapeutic interest because epigenetic changes have the potential to be reversed to restore gene expression. We aim to develop novel epigenome editing tools to induce DNA demethylation at specific genomic loci in order to upregulate tumour suppressor genes and inhibit skin cancer.

**Methods used** We used the CRISPR-Cas9 system to recruit DNA-modifying enzymes to specific genomic loci. Specifically, deactivated Cas9 (dCas9) was fused to the catalytic domain (CD) of ten-eleven translocation methylcytosine dioxygenase 1 (TET1) that induces DNA demethylation. We constructed a doxycycline-inducible lentiviral vector that expresses dCas9-TET1CD with EGFP as a reporter. Human cell lines 293T and A-431 were transduced with the dCas9-TET1CD lentivirus and sorted for high levels of EGFP expression. Also, guide RNAs (gRNAs) were designed to direct dCas9-TET1CD to the p14<sup>ARF</sup> promoter. Sorted cells were transduced with another lentivirus encoding these gRNAs.

**Summary of results** Stable cell lines with gRNA targeting p14<sup>ARF</sup> promoter were treated with doxycycline for 3 days to induce dCas9-TET1CD expression. Methylated DNA immunoprecipitation (MeDIP) demonstrated that DNA methylation levels (5-methylcytosine) were decreased at p14<sup>ARF</sup> promoter compared to parental untransduced cells. RT-qPCR analysis revealed that mRNA levels of p14<sup>ARF</sup> paradoxically decreased when dCas9-TET1CD demethylated the p14<sup>ARF</sup> promoter. This is likely due to steric obstruction of RNA polymerase by dCas9-Tet1CD binding downstream of p14<sup>ARF</sup> promoter,

highlighting the importance of appropriate selection of target sequences.

**Conclusions** Our inducible system for targeted DNA demethylation is versatile and can target multiple genomic loci simultaneously by constructing multiple gRNAs into the same vector. Further investigations are needed to determine cancer-inhibiting effects of DNA demethylation specifically at p16<sup>INK4A</sup> and/or p14<sup>ARF</sup> promoter on proliferation, migration, and invasion of skin cancer.

#### 107 METABOLIC REPROGRAMMING TO ENHANCE THE EFFICACY OF MTOR INHIBITION IN COLORECTAL CANCER

PJ Klauk\*, M Weber, TM Pitts. *University of Colorado School of Medicine, Denver, CO*

10.1136/jim-2017-000663.107

**Purpose of study** PI3K/mTOR pathway is mutated in 10%–20% of colorectal cancer (CRC) specimens and has been associated with poor survival. In this study, we found diacylglycerol kinase (DGK), involved in lipid signalling, to be synthetically lethal in mTOR inhibitor resistant CRC. We evaluated the antiproliferative and pharmacodynamic effects of dual inhibition with an mTOR (TAK-228) and DGK (ritanserlin and R59022) inhibitors.

**Methods used** A synthetic lethal screen was performed with two TAK-228 resistant colorectal cancer cell lines (HCT116 and SW620). Subsequent experiments were performed with one TAK-228 sensitive (DLD1) and one resistant (HCT116) CRC cell lines. Efficacy of TAK-228 +Ritanserlin and TAK-228 +R59022 combination therapy was evaluated by Cell-Titer-Glo cell viability and clonogenic colony formation assays. Pharmacologic DGK inhibition was phenocopied using lentiviral shRNA knockdown of two DGK isoforms (DGKα and DGKζ). Immunoblotting was performed to evaluate mechanism of action of TAK-228 combination therapy.

**Summary of results** TAK-228 combined with ritanserlin and R59022 displayed decreased cell viability and colony formation as compared to either single agent. Lentiviral shRNA transduction resulted in DGKα and DGKζ knockdown as evaluated by RT-PCR and immunoblotting. Phenocopy combination therapy with TAK-228 and DGKα resulted in an increased sensitivity to mTOR inhibition compared to mock transduced control. Immunoblotting confirmed TAK-228 abrogates PI3K/mTOR pathway activity. DGK inhibition alone resulted in a reciprocal increase in mTOR pathway activation, indicating the need for combination therapy.

**Conclusions** Pharmacologic and shRNA knockdown inhibition of DGK in combination with mTOR inhibition resulted in decreased cancer cell viability as well as decreased colony formation. These results suggest a therapeutic anticancer advantage of targeting lipid metabolism simultaneously with mTOR inhibition. Recently, DGK inhibition has been implicated as an immunomodulator and could be beneficial in potentiating the effects of immune checkpoint inhibition. The rational combination of DGK and mTOR inhibition is promising both as a targeted anti-cancer therapy as well as the possible effect to modulate immune system response.



108

# FACTORS ASSOCIATED WITH ACCESS TO IMMUNOTHERAPY AND ITS IMPACT ON SURVIVAL IN MUCOSAL MELANOMA

<sup>1</sup>J Lee\*, <sup>2</sup>B Babcock, <sup>3</sup>MD Rodrigues. <sup>1</sup>Loma Linda University School of Medicine, Loma Linda, CA; <sup>2</sup>Loma Linda University Medical Centre, Loma Linda, CA; <sup>3</sup>Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.108

**Purpose of study** This study aims to identify patient socioeconomic and treating facility factors in mucosal melanoma patients that are associated with access to immunotherapy and its impact on the survival of mucosal melanoma patients.

**Methods used** Using the National Cancer Database (NCDB), patients with mucosal melanoma were identified from 2012–2014. Univariate and multivariate regression models were used to analyse factors including age, gender, socioeconomic status, race, treatment facility, and Charlson-Deyo score and their effects on access to immunotherapy as well as their impact on overall survival. A Kaplan Meier curve and a cox regression analysis were used to compare the effect of immunotherapy on overall survival.

**Summary of results** 704 patients with mucosal melanoma were identified in the NCDB between 2012–2014. Of these patients, 656 subjects were used for multivariate analysis to determine odds ratios for receiving immunotherapy. Median overall survival was 17.2±11.1 months. On multivariate analysis, younger age (age <50 years) was associated with increased odds of receiving immunotherapy (OR: 5.05, CI 95%: 2.17–11.72, p=0.001). The presence of metastatic disease increased the odds of receiving immunotherapy (OR: 2.63, CI 95%: 1.54–4.35, p<0.001). Male gender (HR: 1.5, p=0.007), age less than 50 years (HR: 0.44, p=0.011), and treatment in an academic facility (HR: 1.36, p=0.040) were significantly associated with increased risk of death. Immunotherapy had no effect on risk-adjusted overall survival (HR: 0.88, p=0.713).

**Conclusions** In this large cohort of mucosal melanoma, younger patients with metastatic disease were more likely to undergo immunotherapy. However, treatment with immunotherapy was not associated with the patients' risk-adjusted overall survival. Treatment in an academic facility and male gender did appear to have a negative impact on overall survival, which warrants future studies.

109

# INVESTIGATING MECHANISMS OF PI3K INHIBITOR RESISTANCE IN HEAD AND NECK SQUAMOUS CELL CARCINOMA

M Vien\*, CD Young, X Wang. University of Colorado School of Medicine, Aurora, CO

10.1136/jim-2017-000663.109

**Purpose of study** Head and neck squamous cell carcinoma (HNSCC) is the sixth most common type of cancer worldwide and with a 5 year survival rate of 40%–50%, the morbidity associated with HNSCC remains high. Phosphoinositide 3 Kinase (PI3K) is a pro-survival molecule associated with tumorigenesis and tumour progression in many types of cancer, including HNSCC. BKM120 (Buparlisib) is a pan class I PI3K inhibitor currently in clinical trials for treatment of HNSCC. This study aims to investigate the potential mechanisms by which HNSCC may acquire resistance to BKM120 so superior treatment strategies can be devised for the benefit of HNSCC patients.

**Methods used** BKM120-sensitive human HNSCC cell lines (Cal27 and UMSCC1) were made resistant to BKM120 by gradually increasing BKM120 concentration in a stepwise manner over time. Parental and BKM120-resistant HNSCC cells were evaluated for proliferation, receptor tyrosine kinase (RTK) activation, downstream signalling activation, and drug sensitivity in cell culture models of HNSCC.

**Summary of results** Sulphorhadamine B (SRB) viability assay confirmed that BKM120-resistant Cal27 and UMSCC1 cells were less sensitive to BKM120 than parental cells. Cell lysates from parental and BKM120-resistant cells were applied to a receptor tyrosine kinase (RTK) antibody array to determine potential RTKs that may be activated in BKM120 resistant cells. P-Met was identified as being upregulated in the Cal27 BKM120-resistant cells compared to parental Cal27 cells. This P-Met upregulation was verified via Western Blot. To determine whether changes in Met activity were causally related to BKM120 resistance, we tested proliferation of cells treated ±BKM120 and ±Met inhibitor, Tivantinib. Cal27 and UMSCC BKM120-resistant cells demonstrated increased P-Met activity in the presence of BKM120 as verified by Western Blot. Co-treatment with BKM120 and Tivantinib demonstrated a reduction in P-Met levels and superior growth inhibition in the UMSCC BKM120-resistant cells.

**Conclusions** This study is ongoing. At present, our data indicate that Met/HGF signalling plays a causal role in HNSCC cell BKM120 resistance. These findings have important implications for both patient selection and the development of strategies to overcome resistance.

110

# QUESTIONING THE QUALITY OF ONLINE THYROID CANCER INFORMATION

<sup>1</sup>K Chang\*, <sup>2</sup>EG Grubbs, <sup>1,3</sup>P Ingledew. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>University of Texas MD Anderson Cancer Centre, Houston, TX; <sup>3</sup>BC Cancer Agency, Surrey, BC, Canada

10.1136/jim-2017-000663.110

**Purpose of study** Thyroid cancer is among the most common malignancies in North American young adults. As such, many thyroid cancer patients likely use the internet to seek information. This project evaluates the quality of online information for thyroid cancer patients.

**Methods used** The search term 'thyroid cancer' was entered into Google and meta-search engines Yippy and Dogpile. Inclusion and exclusion criteria were used to create a list of the 'top 100' websites with thyroid cancer patient information. A previously-validated structured rating tool was used to assess sites' currency, disclosure, attribution and content. Two reviewers independently coded sites, and results were evaluated to maximise inter-rater reliability.

**Summary of results** A search for 'thyroid cancer' returned 4,760,000 hits on Google, 6 10 759 on Yippy, and an undisclosed number on Dogpile. Only 26% of the top 100 sites named the authors, and 56% cited sources. 18% contained significant bias. While only 41% provided the date of the most recent update, of those, 90% (36 sites) had been updated within two years. Based on the Flesch-Kincaid Grade Level, 98% of sites required at least high school education for comprehension.

With respect to content, a definition was most often present, on 94% of sites, followed by treatment options (93%) and diagnostic work-up (92%). Least commonly

covered topics were prevention (37%) and incidence or prevalence (57%). While diagnosis and treatment were among the most frequently present, they were also the most frequently incomplete or inaccurate: only 50% of discussions of diagnosis were complete and accurate, and 47% for treatment.

**Conclusions** Many websites are available for patients with thyroid cancer, however quality is variable. Most sites lack information patients can use to assess a website's trustworthiness, such as authorship, citations and currency. Nearly all sites require a reading level far above the average of most patients (i.e., grade six). There are significant gaps in accurate information regarding diagnosis and treatment. This information can help guide care providers and thyroid-centric societies in developing patient education resources.

### 111 MULTIPLEXED MEASUREMENT OF DNA REPAIR CAPACITY FOR TUMOUR HETEROGENITY

L Hardie\*, A Richer, J Hesselberth. *University of Colorado School of Medicine, Aurora, CO*

10.1136/jim-2017-000663.111

**Purpose of study** Mutations in DNA repair factors can lead to development of cancer, and many cancer treatments target DNA repair to cause cell death. We hypothesise that biochemical differences in DNA repair activities may underlie cellular heterogeneity in tumour and cancer pathologies. The goal of this project is to develop a novel assay to measure the DNA repair capacities of cancer cells and to apply it to individual cells in a population.

**Methods used** The assay uses DNA hairpin substrates with different DNA damage events located to each hairpin. Individual hairpins targeting different repair pathways within the cell can be ligated to magnetic beads to test a majority of DNA repair pathways within the cell in a multiplexed fashion. To this end, bead immobilised DNA repair substrates were incubated with bulk cell lysate and products of DNA repair were recovered by bead isolation. PCR amplification and Illumina sequencing were then used to identify repair activities. Bioinformatic pipelines systematically compared differences in repair profiles across conditions in the optimisation of the assay with ATP regeneration and chemotherapy pre-treated cells. Future directions will include the combination of a microfluidic platform for single cell analysis.

**Summary of results** I tested whether an ATP regeneration system improves the signals in the assay. Inclusion of a creatine phosphokinase (CPK) ATP regeneration system increased capture across all repair pathways as compared to controls. We identified significant increases in Nucleotide Excision Repair (NER) and mismatch repair (MMR) that were not seen in the absence of the ATP regeneration system. Pre-treatment of cells with Temozolomide, a clinically useful DNA alkylating agent, demonstrated increased repair activities in Direct Reversal-mediated repair of methylated adducts compared to positive controls.

**Conclusions** The addition of an ATP regeneration system significantly increased capture of repair events by increasing local concentrations of ATP to support cellular enzyme activities. Increases in repair activities were seen across all pathways tested. DNA damaging pretreatments indicated predictable upregulations in certain DNA repair pathways matching the type of DNA damage event generated.

### 112 TOXICITY ANALYSIS OF STEREOTACTIC BODY RADIOTHERAPY WITH IMMUNOTHERAPY FOR PRIMARY AND OLIGOMETASTATIC CANCER

<sup>1,2</sup>JE Juarez\*, <sup>3</sup>A Chen. <sup>1</sup>Charles Drew University of Medicine and Science, Los Angeles, CA; <sup>2</sup>David Geffen School of Medicine at UCLA, Los Angeles, CA; <sup>3</sup>University of Kansas Medical Centre, Kansas City, KS

10.1136/jim-2017-000663.112

**Purpose of study** To analyse radiation toxicity in patients who have received both stereotactic body radiotherapy and immunotherapy.

**Methods used** The medical records of 23 consecutive patients who were treated at a single institution between July 2011 and May 2016 were reviewed. These patients received both stereotactic body radiotherapy (SBRT) and immunotherapy within a one-month window of initiation and completion of SBRT. Excluding sites where SBRT was done as re-irradiation, a total of 40 sites were irradiated among these 23 patients. 12 patients were irradiated for oligometastasis and 11 for primary disease. Sites of treatment with SBRT were classified as: head/neck, liver, lungs/mediastinum, and pelvis/abdomen. The median number of sites irradiated per patient was 1 (range 1 to 5). The median dose was 25 Gy (range 14 to 50). The most common SBRT dose was 18 Gy in 1 fraction (4 patients). Majority of patients received prior chemotherapy (19 patients). Common Terminology Criteria for Adverse Events (CTCAE) and Karnofsky Performance Status (KPS) were analysed using analysis of variance (ANOVA).

**Summary of results** Immunotherapy treatment approach was categorised as: Neoadjuvant only (1 patient); Adjuvant only (3 patients); Neoadjuvant+concurrent (2 patients); Concurrent +adjuvant (1 patient); Neoadjuvant+concurrent+ adjuvant (16 patients). Immunotherapy drugs administered were Cetuximab, Ipilimumab, Nivolumab, Pembrolizumab, Regeneron 2810, Rituximab, and Durvalumab+Tremelimumab. The median duration of immunotherapy use was 3 months. 21 patients tolerated treatment well with minimal toxicity. A grade 3 toxicity was seen in one patient (spinal fracture), and a grade 2 toxicity was seen in another patient (pharyngitis).

**Conclusions** While SBRT is the standard of care for treatment of metastatic cancer, a potential side effect is toxicity. This retrospective study found that patients treated with both SBRT and immunotherapy tolerated treatment well. Therefore, toxicity from dual treatment approach was similar to that of monotherapy.

### 113 ASYMPTOMATIC CHARCOT MARIE TOOTH SYNDROME WITH HYPERSENSITIVITY TO VINCRISTINE

<sup>1</sup>B Shoua\*, <sup>2</sup>S Gholam, <sup>1</sup>R Jariwal, <sup>1</sup>K Sabetian, <sup>1</sup>A Aboed, <sup>1</sup>E Cobos. <sup>1</sup>Kern Medical, Bakersfield, CA; <sup>2</sup>University of Southern California, Los Angeles, CA

10.1136/jim-2017-000663.113

**Case report** A 56-year-old female presented with complaints of bilateral upper and lower extremities weakness for 10 days after 2nd cycle of R-CHOP therapy for large B-cell lymphoma. The symptoms started after 1st cycle with mild weakness and numbness in the tips of fingers and toes. The peripheral neuropathy worsened 10 days after 2nd cycle containing low-dose Vincristine with patient now being unable to walk, and being completely bed ridden. Physical examination showed severe motor weakness and decreased sensation to



Abstract 113 Figure 1

light touch and pinprick in bilateral upper and lower extremities, up to the knees and elbows, along with pes cavus and hammertoes in both feet. Upon further investigation, several family members in patient's family including her father and three siblings had been diagnosed with Charcot Marie Tooth disease and patient herself had difficulty walking due to severe pes cavus on bilateral feet. Nerve conduction and EMG studies of bilateral upper and lower extremities indicated severe diffuse sensory motor neuropathy with absent action potentials, severe active denervation in forearm, hands, lower leg muscles, and proximal leg muscles. Genetic testing revealed a pathogenic variant and duplication of the entire PMP22 gene, which is consistent with the diagnosis of Charcot Marie Tooth subtype 1A with autosomal dominant manifestation of the progressive hereditary neuropathy. R-CHOP therapy was ceased when CMT was suspected. After 6 months of physical therapy, she is now able to grasp objects by hand, move all four extremities and is able to perform activities of daily living with assistance.

#### 114 EPSTEIN-BARR VIRUS ASSOCIATED PAEDIATRIC HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS IN NEW MEXICO

EW Hatch\*, S Abraham. *University of New Mexico, Albuquerque, NM*

10.1136/jim-2017-000663.114

##### Case report

**Background** Hemophagocytic lymphohistiocytosis (HLH) is an immune activation syndrome arising either as a primary form of heritable gene mutations or induced secondarily by immune insult, such as autoimmune disease or viral illness, most commonly EBV. Here we compare two unrelated cases of EBV associated HLH, admitted to our institution in a single month.

**Patient A** is a previously healthy 5-year-old female who presented with 7 days of fever, fatigue, oral lesions, and splenomegaly.

**Patient B** is a previously healthy 15-month-old female who presented with 4 days of fever, fatigue, significant lymphadenopathy, and hepatosplenomegaly.

**Discussion** The general reported incidence of HLH is 1.2 cases per 1,000,000 individuals per year. Despite this rare prevalence, there has been 4 paediatric EBV associated HLH cases in our hospital in the past year. The 2 cases reported

**Abstract 114 Table 1** Key presenting characteristics of two patients with EBV-HLH

Labs at presentation	Patient A	Patient B
Age	5 years	15 months
Ethnicity	Hispanic	Native American
Liver/spleen	Splenomegaly	Hepatosplenomegaly
WBC (x10E3/uL)	5.4	1.9
Haemoglobin (g/dL)	12.6	10.6
Platelets (x10E3/uL)	146	72
PT(sec)/INR/aPTT(sec)	13/1.12/42	15.5/1.33/37
Fibrinogen (mg/dL)	53	101
D-dimer (ng/mL)	20 267	21 367
AST/ALT (Units/L)	380/302	562/315
Ferritin (ng/mL)	26 619	6698
LDH (Units/L)	NA	2775
Triglycerides (mg/dL)	325	80
Soluble IL-2R (Units/L)	10 549	Pending
EBV Titers (copies/mL)	1 60 000	>1,000,000
CSF	Negative for hemophagocytosis	Cytology pending
MRI brain	Normal	Normal

above have been diagnosed in the past month. Both patients have started treatment per HLH-2004 protocol. 2 of the 4 patients are of Native American ethnicity.

The main questions to be raised by this observation is the possibility of an EBV strain endemic to the area, that could have triggered a significant immune response culminating in HLH. The other question is the possibility of a yet undefined genetic association or underlying biology specific to a certain population or ethnic group in New Mexico.

## Neonatology–pulmonary II

### Concurrent session

3:15 PM

Thursday, January 25, 2018

#### 115 EVALUATING SAFETY OF ENDOTRACHEAL INTUBATION IN INFANTS ADMITTED TO A SINGLE CENTRE NEONATAL INTENSIVE CARE UNIT

<sup>1</sup>F Ross\*, <sup>2</sup>FB Wertheimer, <sup>2</sup>M Biniwale. <sup>1</sup>Keck School of Medicine of USC, Los Angeles, CA; <sup>2</sup>Keck School of Medicine of USC, LAC+USC Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.115

**Purpose of study** Preterm as well as term infants admitted in the Neonatal Intensive Care Unit (NICU) undergoing intubation may have high rates of adverse events. There are limited studies on the factors contributing towards adverse events in these infants. This study aims to identify factors that correlate with adverse events associated with intubation.

**Methods used** A retrospective chart review was conducted by collecting data through the NICU database and medical records from infants admitted to the NICU who had intubations performed from January 2014 to June 2016. The primary outcome was to identify intubations with adverse events, and associated variables including number of intubation



Abstract 115 Table 1

Adverse event	Number of occurrence	Percentage of occurrence n=44	Percentage of all patients n=178
Oral/airway bleeding	10	22.7%	5.6%
Isolated hypoxia	14	31.8%	7.9%
Bradycardia	21	47.7%	11.8%
Heart rate			
Chest wall rigidity	2	4.5%	1.1%
Cardiopulmonary resuscitation	15	34.1%	8.4%
Resuscitation requiring epinephrine	12	27.3%	6.7%

attempts, personnel performing intubations and medications received prior to intubation. The results were analysed using IBM SPSS statistical software version 24.

**Summary of results** Out of 178 infants intubated during the study period, 44 (24.7%) infants had adverse events. Frequency of adverse events was similar in the infants irrespective of where intubation was performed; delivery room vs NICU. The procedures on infants requiring more than 1 intubation attempt were significantly associated with adverse events (38.1% vs 12.4%;  $p < 0.001$ ). The older infants by chronological age (mean 16 days vs 7 days) were more likely to have an adverse event during intubation than younger ones ( $p = 0.036$ ). Premedication for intubation had no correlation with adverse events. The common adverse events are included in the table with percentages of each event.

**Conclusions** Almost a quarter of the NICU infants intubated suffered at least one adverse event at the time of intubation. More than a third of the adverse events consisted of cardiopulmonary resuscitation. Multiple attempts and older age of infant were the most common associations.

116

#### QUALITY IMPROVEMENT WITH RESPIRATORY CARE BUNDLE TO IMPROVE PRETERM INFANT OUTCOMES IN A HIGH ALTITUDE CENTRE

<sup>1</sup>M Santos Oren\*, <sup>1</sup>V Ianus, <sup>2</sup>A Stefanescu, <sup>1</sup>B Stefanescu. <sup>1</sup>University of New Mexico, Albuquerque, NM; <sup>2</sup>Harvard School of Public Health, Boston, MA

10.1136/jim-2017-000663.116

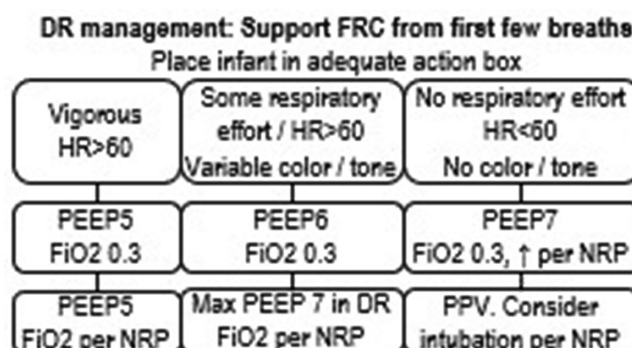
**Purpose of study** Preterm infants born at high altitude centres are at increased risk for chronic lung disease (CLD) compared to peers born at sea level. The objective of this study is to determine the impact of a standardised respiratory care bundle (RCB) protocol on short-term outcomes including CLD, length of stay, and mortality in a subgroup of preterm infants in one centre at high altitude.

**Methods used** The Respiratory Quality Improvement (QI) Team developed a RCB protocol including flow diagrams with emphasis on use of nasal continuous positive airway pressure (NCPAP) for delivery room and NICU management (figures 1 and 2) of infants born at 26 0/7 to 30 6/7 weeks GA in our Level IV NICU at an altitude of 5400'. The intervention started September 2016. Preterms born in the year preceding RCB intervention were used as controls.

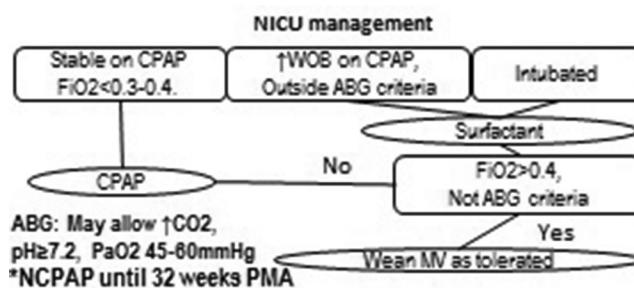
**Summary of results** In the first 9 months of intervention, 88 infants (44 RCB group and 44 Control group) were studied. Rate

of CLD was similar between study groups (68% versus 71%). However infants in the RCB group had shorter length of stay (73 versus 78 days) and lower mortality (6% versus 18%).

**Conclusions** RCB protocol was safe and well tolerated. Ongoing data collection and analysis continues. To date, the protocol reduced length of hospital stay and mortality.



Abstract 116 Figure 1 DR management



Abstract 116 Figure 2 NICU management

117

#### CORRELATION OF PAO<sub>2</sub>/FIO<sub>2</sub> RATIO TO SPO<sub>2</sub>/FIO<sub>2</sub> RATIO IN NEONATES WITH RESPIRATORY DISTRESS

RN Kibe\*, H Muniraman, K Fletcher, R Ramanathan, M Biniwale. Keck School of Medicine of USC, LAC+USC Medical centre, Los Angeles, CA

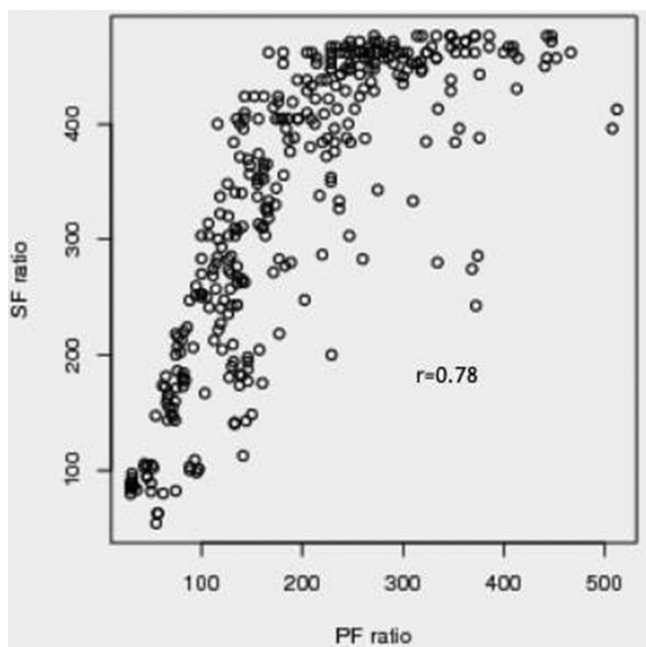
10.1136/jim-2017-000663.117

**Purpose of study** To validate the comparability of the PF (PaO<sub>2</sub>/FiO<sub>2</sub>) ratio, a marker for severity of acute lung injury and acute respiratory distress syndrome to SF (SpO<sub>2</sub>/FiO<sub>2</sub>) ratio in neonates with respiratory distress.

**Methods used** Data collected from arterial blood gases and noninvasive saturation monitoring over the first three days of NICU admission from neonates admitted with respiratory distress. PF and SF ratios were calculated for each set of data. Correlation between PF and SF ratios were analysed using Pearson's correlation coefficient.

**Summary of results** In 2016, 348-paired measurements were collected from 46 neonates with a median of 6 samples (IQR 3-10) per patient. Overall, PF and SF ratio showed strong correlation ( $r = 0.78$ ) (figure 1) with stronger correlation in preterm infants ( $r = 0.83$ ) than term infants ( $r = 0.75$ ). PF ratio from umbilical artery catheter sample correlated more strongly with SF ratio from post-ductal saturation ( $r = 0.80$ ) when compared to pre-ductal saturation ( $r = 0.73$ ). PF ratio <300





**Abstract 117 Figure 1** Correlation of PF to SF ratio

( $r=0.86$ ) correlated with SF ratio more strongly than PF <200 ( $r=0.80$ ).

**Conclusions** The PF and SF ratios strongly correlate suggesting that non-invasive monitoring can be reliably used to assess clinical status in neonates. SF ratio may be used as a surrogate marker for PF ratio. However further studies including larger sample size are needed to correlate with clinical outcomes.

#### 118 PULMONARY INTERSTITIAL EMPHYSEMA: OLD ENEMY OF NEW GENERATION PRETERM INFANTS

P Bhatt\*, RN Kibe, L Barton, R Ramanathan, M Biniwale. *Keck School of Medicine of USC, LAC+USC Medical Centre, Los Angeles, CA*

10.1136/jim-2017-000663.118

**Purpose of study** Perinatal management of preterm delivery has improved considerably in recent years with increased use of antenatal steroids, stabilisation with non-invasive ventilation (NIV), and avoidance of prophylactic surfactant therapy. Pulmonary interstitial emphysema (PIE) is a serious complication of invasive mechanical ventilation in preterm infants that may lead to air leaks and/or bronchopulmonary dysplasia (BPD). We compared characteristics of premature infants developing PIE in two time frames, and compared them to infants of similar gestation to assess risks associated with developing PIE. **Methods used** This was a retrospective cohort study from 2001 to 2016 at a level 3 neonatal intensive care unit. Characteristics of infants with PIE in Period 1 (P1, 2001–2008) were compared to infants with PIE in Period 2 (P2, 2009–2016). P2 infants were also compared to infants of similar gestational age without PIE to find risks associated with developing PIE. IBM SPSS version 24 software was used for stepwise logistic regression analysis.

**Summary of results** A total of 77 patients developed PIE during the study periods. Incidence of PIE in very low birth weight infants was comparable in both periods with 44 (9.7%) in P1 compared to 33 (10.3%) in P2. Infants from P2

had significantly lower mean gestational age (24.5 wks vs 25.4 wks;  $p=0.020$ ) as well as birth weight (629 g vs 762 g;  $p=0.003$ ) compared to P1. All neonatal morbidities including survival were similar between the groups. All infants in P2 were less than 28 weeks gestation. Infants in P2 compared to infants without PIE using logistic regression controlling for gestational age revealed the most important differentiating factor was invasive ventilation at 24 hours of age ( $p=0.029$ ). More infants with PIE compared to without PIE had increased duration of invasive ventilation ( $p<0.001$ ) and BPD ( $p=0.034$ ). Mortality and other neonatal morbidities were not significantly different.

**Conclusions** Infants with lower gestational age and birth weight are still at risk for developing PIE. Invasive ventilation at 24 hours is a significant risk factor for developing PIE in preterm infants. Aggressive extubation to NIV as soon as possible may likely improve short- and long-term pulmonary outcomes.

#### 119 OPERATIVE REPAIR IN DIAPHRAGMATIC HERNIA: HOW LONG DO WE REALLY NEED TO WAIT?

<sup>1</sup>K Cox\*, <sup>2</sup>S Fenton, <sup>2</sup>B Yoder. <sup>1</sup>Univ of Utah SOM, salt Lake City, UT; <sup>2</sup>Univ of Utah, Salt Lake City, UT

10.1136/jim-2017-000663.119

**Purpose of study** The timing of surgical repair in infants with CDH remains controversial. The purpose of this study was to analyse preoperative trends in cardiopulmonary support related to operative repair of ventilated CDH infants not on ECMO.

**Methods used** We analysed 319 infants treated between 1998–2016. We excluded the following: lethal anomaly ( $n=31$ ); diagnosis after 24 hours ( $n=26$ ); outside repair ( $n=6$ ); ECMO prior to 48 hours ( $n=63$ ); and death without repair prior to 24 hours ( $n=21$ ) leaving a study group of 172. Oxygenation Index ( $Paw \cdot FiO_2 \cdot 100 / PaO_2$ ) and Oxygenation Saturation Index ( $Paw \cdot FiO_2 / PreSAT$ ) were calculated pre-/post-operatively and in 24 hour increments for the first six days of life.

**Summary of results** Intraclass Correlation Coefficient (ICC) demonstrated that OI (ICC 0.70, 95% CI: 0.61 to 0.77) and OSI (ICC 0.79, 95% CI: 0.72 to 0.84) were temporally reliable and that an infant's initial value was representative of the preop mean. There were no significant differences between the initial, immediate preop, and mean preop OI and OSI values. ROC curves were constructed. An initial OI  $\leq 9.41$  (AUC 0.95) or OSI  $\leq 6.24$  (AUC 0.97) was predictive of survival; infants were classified as achieving this preop value or not. Among repaired infants, 90% achieved the OI cutoff at median (IQR) 24 (24–24) hrs, and 75% of infants achieved the OSI cutoff at median 24 (24–48) hrs. Multivariate linear regression including the presence of right-left ductal shunt and birthweight was used to predict geometric mean (GM) vent days and discharge age (days) when surgical repair was delayed beyond initial preop achievement of each OI and OSI cutoff. Insignificant predictors were removed including inotropes score (for discharge age), inhaled NO, and liver position. Surgical delay beyond initial achievement of OI  $\leq 9.41$  resulted in a significant increase in GM vent days (1.40, 95% CI: 1.05 to 1.87) and discharge age (1.53, 95% CI: 1.18 to 1.97). Surgical delay beyond initial achievement of OSI  $\leq 6.24$  also resulted in a significant increase in GM vent days (1.56, 95% CI: 1.15 to 2.10) and discharge age (1.60, 95% CI: 1.25 to 2.04).

**Conclusions** Initial OI and OSI values are temporally reliable and change minimally after 24 hours age. Delay in surgical repair of CDH beyond initial stability increases ventilator days and discharge age.

## 120 THE CAUSES AND CONSEQUENCES OF UNPLANNED EXTUBATION IN NEONATES

<sup>1,2</sup>K Kambestad\*, <sup>1</sup>S Nair, <sup>1</sup>S Chin, <sup>1</sup>R Chapman, <sup>1</sup>L Langga, <sup>1</sup>E Mounger, <sup>1</sup>E Guerrero, <sup>1</sup>N Iyer. <sup>1</sup>Children's Hospital Los Angeles, Los Angeles, CA; <sup>2</sup>LAC+USC Medical Centre, Los Angeles, CA

10.1136/jim-2017-000663.120

**Purpose of study** Unplanned extubation (UE) requiring reintubation is the fourth most common adverse event in NICUs in the United States. Our goals are to elucidate factors related to the circumstances of UE, and to analyse the physiologic consequences of UE in infants.

**Methods used** As part of an ongoing quality improvement initiative, data was prospectively collected on all infants who had a UE event beginning in 2012. A retrospective chart review was then performed for each patient to obtain additional demographic data and clinical outcomes following the event.

**Summary of results** Over a five-year period there were 124 documented events. UE occurred 22 times in patients with critical airways, and reoccurred ( $\geq 2$  UEs) in 26 patients. The most common known cause of UE was agitation (figure 1). 48% of patients (n=60) were given a trial of extubation, of which 65% (n=39) were successful at 48 hours. In cases of extubation failure, average time to reintubation was 12.5 hours after UE. Of the 52% of patients who required immediate reintubation, 14% (n=17) sustained a code event requiring CPR. 8% of patients (n=10) had difficult reintubation. Multi-variable risk factors associated with significant haemodynamic instability (SHI) included higher FiO<sub>2</sub>, higher MAP, and higher last NPASS score ( $p < 0.05$ ). 10% of infants required antibiotics for pneumonia. Patients with SHI following UE had higher reintubation rate and higher incidence of pneumonia. Mean airway pressure after reintubation increased in 31% of patients by a mean of 2.15 for an average duration of 37 hours. FiO<sub>2</sub> increased in 73% of patients by a mean of 0.28 for duration of 40 hours.

**Conclusions** UE in neonates can have significant clinical consequences, including haemodynamic instability and increased risk for ventilator associated pneumonia.

## 121 RESPIRATORY MORBIDITY AND MORTALITY IN VERY LOW BIRTH WEIGHT INFANTS: CHANGES IN VENTILATION PRACTICES AND OUTCOMES FROM A SINGLE CENTRE OVER A 16-YEAR SPAN

<sup>1,2</sup>RN Kibe\*, <sup>1,2</sup>L Barton, <sup>1,2</sup>R Ramanathan, <sup>1,2</sup>M Biniwale. <sup>1</sup>Keck School of Medicine of USC, Los Angeles, CA; <sup>2</sup>LAC+USC Medical Centre, Los Angeles, CA

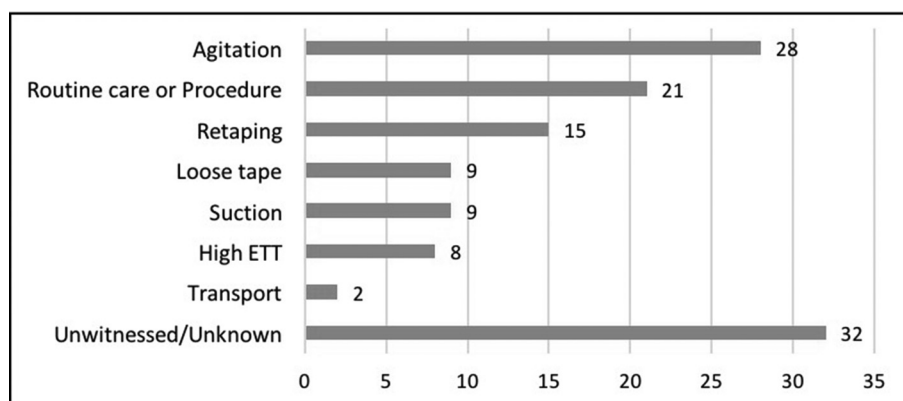
10.1136/jim-2017-000663.121

**Purpose of study** The use of invasive mechanical ventilation (IMV) has been shown to be associated with a number of pulmonary and non-pulmonary morbidities in very low birth weight (VLBW) infants, notably bronchopulmonary dysplasia (BPD) and neurodevelopmental impairment. Various techniques of non-invasive and minimally invasive ventilation have been implemented in order to reduce the incidence as well as the morbidity and mortality associated with IMV. Our aim was to evaluate changes in neonatal ventilation practices and its influence on respiratory morbidity and mortality among VLBW infants in a single centre comparing 2 consecutive periods (2001–2008 and 2009–2016). IRB approval was obtained prior to study. The practices included increasing use of non-invasive ventilation via modified nasal cannula for resuscitation in the delivery room as well as use of nasal intermittent positive pressure ventilation (NIPPV) as a primary mode of respiratory support in NICU, adoption of INSURE technique for surfactant administration and aggressive weaning of infants from IMV to NIPPV.

**Methods used** We reviewed data entered prospectively in our database of inborn VLBW infants; Group A (2001–2008) and Group B (2009–2016). The demographic data, modes and duration of ventilation, BPD incidence and survival rates were collected. IBM SPSS version 24 was used for statistical analysis.

**Summary of results** A total of 784 VLBW infants met the inclusion criteria. Mean gestational ages were similar (27 weeks for both groups) whereas infants in Group B were significantly smaller at birth (Group A 1000 g vs Group B 949 g;  $p = 0.023$ ). The mortality rate in Group B was notably lower at 7.7% vs 15.1% in Group A ( $p = 0.001$ ). Percent of infants surviving without BPD was significantly higher at 61.3% in Group B compared to 51.3% in Group A ( $p = 0.006$ ). IMV rates were lower in Group B at 66% compared to 77% in Group A ( $p = 0.001$ ), while NIPPV rates were higher in Group B ( $p = 0.001$ ).

**Conclusions** Changes in ventilation practices in the delivery room and NICU were associated with less IMV and more non-invasive ventilation. Increasing use of NIPPV was associated with increased BPD free survival in VLBW infants.



Abstract 120 Figure 1 Causes of unplanned extubation

122

**EFFICACY & SAFETY OF MILRINONE IN NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA (CDH)**M Mears\*, B Yoder. *University of Utah, Salt Lake City, UT*

10.1136/jim-2017-000663.122

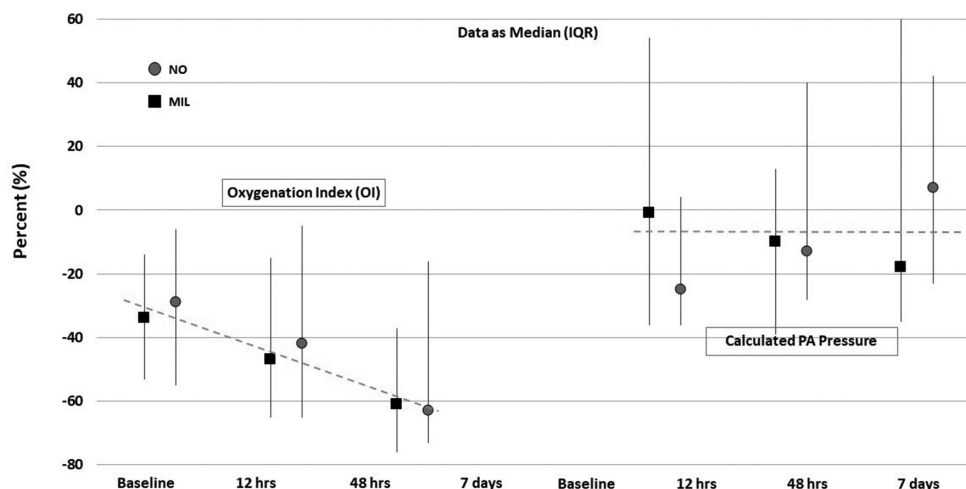
**Purpose of study** Pulmonary hypertension and relative left ventricular dysfunction are common problems in CDH. Milrinone (MIL), a phosphodiesterase-3 inhibitor with lusitropic and vasodilator effects, is utilised in up to 30% of CDH infants across the US. No randomised trials have tested efficacy and safety of MIL in CDH neonates. We compared serial measurements of oxygenation (OI) and ECHO characteristics of ventricular size and pulmonary artery pressure (PAP) between CDH babies treated with MIL or not (NO). Potential adverse effects of milrinone including hypokalemia, thrombocytopenia and bleeding were also assessed.

**Methods used** We performed a retrospective analysis of all CDH infants managed in our NICU from 1/2006–8/2017. We excluded infants placed on ECMO and other with severe anomalies; (n=94, MIL=31, NO=63). Efficacy was assessed by changes in OI and PAP evaluated at: baseline, 12–24 hours, 48 hours and 5–7 days. We assessed for non-operative bleeding, dysrhythmia, hypokalemia and thrombocytopenia over the same time points.

**Summary of results** MIL median start age was 17 hours and median duration was 160 hours. Groups were of similar GA and BWT, but MIL infants had higher rates of iNO and inotropes use, larger defects and more frequent bidirectional ductal shunt (table 1). Percent change in OI and PAP were similar over time between groups. (Figure 1) LV diastolic volume was lower in MIL infants and did not significantly improve over time. Hypokalemia, thrombocytopenia and bleeding were not associated with MIL therapy.

**Abstract 122 Table 1**

	EGA (wks)	BWT (g)	Male (%)	Fetal Dx	Defect >2	Patch	Bi- PDA	iNO	Dopa
NO; n=56	38.2 (1.5)	3137 (481)	33 (59%)	23 (41%)	12 (21%)	6 (11%)	30 (54%)	30 (54%)	34 (61%)
MIL; n=31	38.1 (1.5)	3041 (420)	19 (61%)	23 (74%)	12 (39%)	8 (26%)	27 (87%)	27 (87%)	29 (94%)

**Abstract 122 Figure 1** Change in OI & PAP from baseline: milrinone vs none

**Conclusions** MIL use was associated with similar improvement in OI, PAP and cardiac function as NO milrinone therapy. No adverse effects were associated with MIL use. Randomised trials are needed.

**Neonatology—general II****Concurrent session****3:15 PM****Thursday, January 25, 2018**

123

**DOES INDOMETHACIN USED FOR TREATMENT OF PATENT DUCTUS ARTERIOSUS (PDA) LEAD TO NECROTIZING ENTEROCOLITIS AND/OR INTESTINAL PERFORATION IN PREMATURE INFANTS?**

<sup>1,2</sup>B Hwee\*, <sup>1</sup>A Wu, <sup>1</sup>A Bracamonte, <sup>1</sup>B Chun, <sup>1</sup>J Chadwick, <sup>1</sup>K Lee, <sup>1</sup>O Shayegh, <sup>1</sup>T Goel, <sup>1,3</sup>B Afghani. <sup>1</sup>University of California, Irvine, Irvine, CA; <sup>2</sup>University of California, Los Angeles, Westwood, CA; <sup>3</sup>CHOC Hospital of Orange, Orange, CA

10.1136/jim-2017-000663.123

**Purpose of study** It is unclear whether use of indomethacin (INDO) for treatment of PDA in premature infants has an effect on the development of necrotizing enterocolitis (NEC) or spontaneous intestinal perforation (SIP). The purpose of this study is to investigate if the post-natal administration of INDO is associated with an increased risk of developing NEC and SIP in premature infants.

**Methods used** A literature review using Pubmed and Google Scholar with the keywords Patent Ductus Arteriosus, Indomethacin, Intestinal Perforation and Necrotizing Enterocolitis was conducted. Only studies published after 1990 with premature infants who were administered INDO after birth as treatment for PDA were included. Studies without a control group (no INDO) were excluded.

**Summary of results** Of the 23 articles, only 7 satisfied our inclusion criteria (see table 1). The main reason for exclusion was lack of control group or use of treatments other than INDO. The dosage and timing of INDO administration were variable among studies. Only 1 of 7 studies found a significant increase in NEC occurrence in the INDO group. Most

Abstract 123 Table 1

First author and year	Gestational age and birth weight (Grams)	Timing of INDO administration	Subject INDO w/NEC	Control group w/NEC	Subject INDO w/IP	Control group w/IP	NEC P-value	IP P-value
Grosfeld 1996		3 to 7 days of age	90/252 (35%)	105/764 (13.7%)	27/252 (10.7%)	13/764 (1.7%)	p<0.02	p<0.05
Fujii 2002		ETG=Early Treatment: First 2 days of life STG=Standard Treatment: After 2 days of life	ETG=10/30 (33%)	STG=9/32 (28%)	ETG=6/30 (20%)	STG=0/32 (0%)	p=0.659	p=0.011
O'Donovan 2003		As needed for significant PDA	14/108 (13.0% I) 8/66 (12.0% I-L)	7/50 (14.0% L) 4/66 (6.1% I-L)	5/108 (4.6% I) 4/66 (6.1% I-L)	6/50 (12% L)	NS	NS
Dolberg 2005	24 to 34 weeks	NR	109/1183 (9.2% PDA-I)	192/4488 (4.3% No PDA) 37/373 (9.9% PDA only)	NR	NR	Presence of PDA itself (not I) was significant for NEC	NR
McPherson 2008		As needed for significant PDA	14/228 (6.1%)	47/628 (7.5%)	14/228 (6.1%)	4/628 (0.6%)	NS	p
Pumberger 2014		First 24 hours of life	I+E+114/1186 (10%) I+E- 461/4688 (10%)	I-E+239/3128 (8%) I-E- 667/6749 (8%)	I+E+32/1186 (3%) I+E- 177/4688 (4%)	I-E+35/3128 (1%) I-E- 207/6749 (3%)	NS	Unadjusted p
Paquette 2006		First 48 hours of life	16 patients with IP	32 matched controls	>2 doses of I plus >2 doses of ST increased risk of IP 9.6 times		NS	Increased risk of IP with I plus ST

NR=Not Reported, NS=Not Significant, I=Indomethacin Treatment, L=Surgical Ligation Treatment, E+=Late Feeding (during the first 3 days), E-=Late Feeding (>first 3 days), ST=Steroids

studies found a correlation with INDO and development of SIP, especially if INDO was given early or combined with steroids.

**Conclusions** Our review does not suggest a link between INDO and development of NEC; however, there may be a link between SIP in patients who receive INDO. Prospective studies that control for other variables, such as the effects of dosage and timing of INDO as well as factors such as steroids, other medications, and feeding are warranted.

## 124 OXYGEN CONTENT AND ITS ASSOCIATION WITH RETINOPATHY OF PREMATURITY

P Jung, L Geoffrion\*, G Truong, M Goldstein. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.124

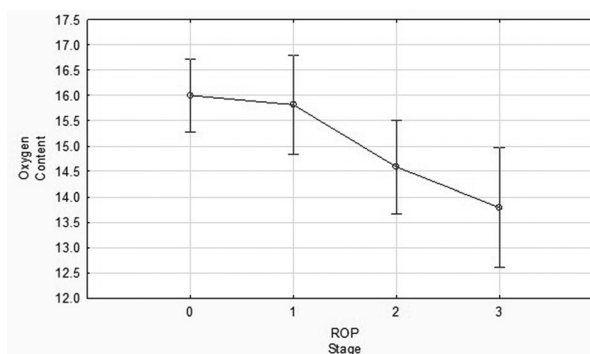
**Purpose of study** Hyperoxia is a significant risk factor for development of retinopathy of prematurity (ROP). Oxygen saturation targets have been widely studied with variable results. We evaluated whether oxygen content was associated with development of ROP.

**Methods used** We retrospectively reviewed charts of infants admitted between January 2013 and December 2016 who were eligible for ROP screening (gestational age  $\leq 30$  weeks or birth weight  $\leq 1500$  grams) and had arterial blood gases obtained in the first 2 weeks of life. Arterial oxygen content values were collected. Outcomes measured were incidence and severity of ROP. Dell Statistica was used for all statistical analysis.

**Summary of results** There were 305 total infants and 132 had ROP (43.3%). Prevalence of stage 1 was 19.0%, stage 2 was

15.4%, and stage 3 was 8.9%; there were no higher stages of ROP in this population. Decreasing oxygen content within the first 2 weeks of life was significantly associated with higher severity of ROP. Infants without ROP had an average oxygen content of  $16.0 \pm 6.0$  (standard deviation). Average oxygen content for stage 1 was  $14.8 \pm 4.6$ , stage 2 was  $14.6 \pm 4.7$ , and stage 3 was  $13.6 \pm 2.4$  ( $p=0.004$ ).

**Conclusions** In our population, higher oxygen content levels within the first 2 weeks of life was associated with decreasing severity of ROP development. As previous studies have shown worse ROP with higher saturation targets, this finding is unexpected. Based on our findings, though, oxygen saturations may only be a component of the mechanism leading to the development ROP. There may be further factors not yet studied that may contribute to its development. Further studies are required.



**Abstract 124 Figure 1** Effective hypothesis decomposition vertical bars denote 0.95 confidence intervals



125

# THE IMPACT OF DELIVERY MODE ON CLINICAL OUTCOMES OF INFANTS BORN AT PERIVIALE AGE

<sup>1</sup>JY Hwang\*, <sup>1,2</sup>C Hayek, <sup>1,2</sup>R Cayabyab, <sup>1,2</sup>R Ramanathan. <sup>1</sup>LAC+USC Medical Centre, Los Angeles, CA; <sup>2</sup>Children's Hospital of Los Angeles, Los Angeles, CA

10.1136/jim-2017-000663.125

**Purpose of study** The mortality and morbidity rate of preterm infants born between 22–24 weeks gestational age (GA) remain high. We wanted to study if there is a difference in short term outcomes of infants born at 22–24 weeks GA if delivered by caesarean delivery (CD) compared to vaginal delivery (VD).

**Methods used** Retrospective data review was conducted from January 2000 to January 2016 on all preterm infants delivered at 22–24 weeks GA with cephalic presentation. All infants born at LAC+USC Medical Centre and Good Samaritan Hospital without congenital anomalies were included in the study. Clinical data was extracted from the neonatal database.

**Summary of results** There was a total of 80 extremely premature infants born at 22–24 weeks of gestation. The majority of infants were born by CD (69%) and 31% by VD. Infants born by CD had a higher GA, higher rate of maternal preeclampsia and antenatal steroid use. However, there was no difference in clinical outcomes and mortality whether born by CD or VD. (Table 1).

**Conclusions** In this retrospective study, CD did not confer benefit of reduced mortality or better clinical outcomes in periviable infants with cephalic presentation. Our findings are consistent with the most recent publication involving 2138 infants from Neonatal Research Network in Japan (Kimura T *et al.* Neonatology 2017;112(3):258–266).

**Abstract 125 Table 1** Demographic and clinical characteristics of the study population

	Vaginal delivery n=25	Caesarean delivery n=55	P-value
Birth weight (grams)*	620 (105)	590 (195)	0.23
Gestational age (weeks)*	23 (1)	24 (1)	<0.001
Female sex n (%)	7 (28)	24 (44)	0.14
Antenatal steroid use n (%)	17 (71)	47 (92)	0.02
Maternal chorioamnionitis n (%)	14 (56)	18 (33)	0.06
Maternal preeclampsia n (%)	2 (8)	18 (33)	0.02
Surfactant dose	1.5 (1)	2 (2)	0.06
BPD n (%)	7 (29)	21 (40)	0.35
Severe IVH n (%)	4 (16)	7 (13)	0.72
Severe ROP n (%)	4 (16)	17 (31)	0.16
NEC n (%)	4 (16)	6 (11)	0.54
Mortality n (%)	8 (32)	11 (20)	0.27

\*median (IQR)

126

# THE EFFECTS OF MATERNAL LULLABY ON PRE-TERM INFANTS

S Kalyanam\*, E Lesser, J Wicke. St. Joseph's Children's Hospital, Paterson, NJ

10.1136/jim-2017-000663.126

**Purpose of study** Fetuses are capable of perceiving and acting on aspects of sound from as early as 3 months prior to birth.

These sounds play a role in attachment and communication during the first years of post-natal life. Hospitalised preterm infants lose significant exposure to their mothers' voices while cared for in the NICU. The goal of this investigation was to examine the effects of exposure to maternal lullaby on pre-term infants between post menstrual weeks 30–34+5 days.

**Methods used** Randomised control study with 64 pre-term infants. 32 pre-term infants were exposed to a lullaby recorded by the mother and played in the incubator for 30 min twice a day for 30 days. Safe sound levels were ensured with decibel levels 55–65 dB. The control group was matched with lullaby group according to gestational age and birth weight, and were provided routine NICU care. 3 dependent variables measured included days to full enteral feedings (FEF), defined as number of days from birth to tolerating 120 ml/kg, days to full oral feedings (FPO), defined as the number of days from birth to tolerate all feeds from bottle, and length of stay. One-way analysis of variance with contrasts between the two groups on each dependent variable separately, along with Eta<sup>2</sup> measures, were used to examine significant differences between the groups and effect size.

**Summary of results** No significant differences between the lullaby and control group were found on days to full enteral feedings (FEF) and days to full oral feedings (FPO) (p>0.05). The effect of lullaby on the dependent variables was negligible (Eta<sup>2</sup> measures were all below 0.1).

**Conclusions** Infants exposed to maternal lullaby did not experience a change in length of stay, time to FEF and time to FPO feedings. These findings differ from previous studies that have shown a decrease in time to full feeding in infants exposed to maternal voice. This study was the first to use matched design between subjects, suggesting perhaps confounding factors may have influenced the differences found in previous studies. Additional investigation of exposure to maternal voice are warranted, including measures of long-term effects.

**Abstract 126 Table 1** Means±SD between groups (n=32)

	GA (days)	Birth Wt. (g)	Length of stay (days)	FEF (days)	FPO (days)	Discharge Wt. (g)
Lullaby	226.5 ±10.0	1789.3 ±418.3	17.6±10.4	13.4 ±8.7	8.8 ±5.6	2195.6±215.7
Control	225.3 ±10.3	1791.5 ±413.6	17.7±8.8	13.6 ±7.5	9.8 ±6.5	2213.1±178.9

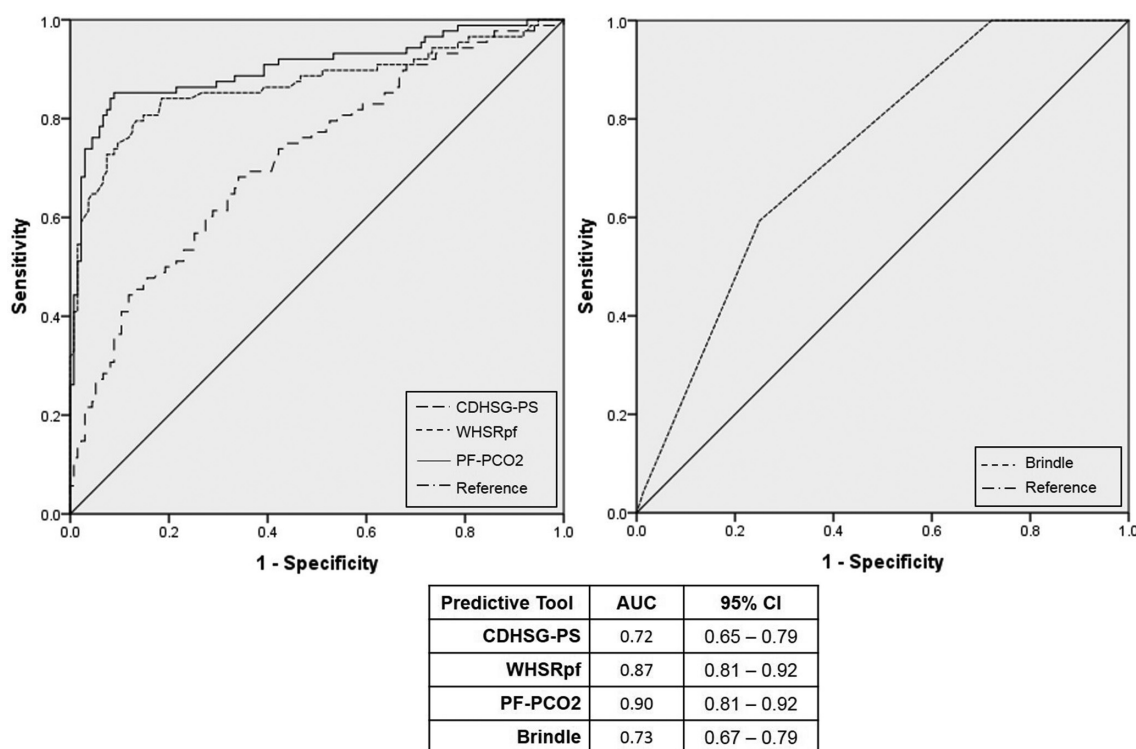
127

# PREDICTING POSTNATAL SURVIVAL IN CONGENITAL DIAPHRAGMATIC HERNIA

MK Sekhon\*. University of Utah, Salt Lake City, UT

10.1136/jim-2017-000663.127

**Purpose of study** A postnatal tool predicting survival in infants with congenital diaphragmatic hernia (CDH) can aid counselling and clinical decision making. This study's purpose was to compare an unstudied equation, PF-PCO<sub>2</sub> ([PaO<sub>2</sub>/FiO<sub>2</sub>]-PCO<sub>2</sub>), with 3 published tools (CDH Study Group Probability of Survival Equation (CDHSG-PS), Wilford Hall Santa Rosa Prediction Formula (WHSRpf), and Brindle Score) to predict survival without extracorporeal membrane oxygenation (ECMO) support.



**Abstract 127 Figure 1** AUC to predict survival without ECMO in CDH patients

**Methods used** A retrospective analysis of infants with CDH from 1/1/1998–7/31/2017. Infants were excluded if: repaired at other centre, diagnosed after 24 hours, or born with other major anomalies. Predictive scores were calculated, comparing those that survived without ECMO to those that died and/or needed ECMO. Area under the curve (AUC) analysis was performed.

**Summary of results** 231 infants were included. Infants surviving without ECMO were older (37.9 vs 36.8 weeks,  $p<0.001$ ), larger (3060 g vs 2784 g,  $p<0.001$ ), less likely to have fetal diagnosis (51% vs 80%,  $p<0.001$ ), and more likely to undergo primary repair (82% vs 16%,  $p<0.001$ ). Median predictive scores were significantly different (table 1). These remain unchanged when infants with other major anomalies are included. The AUC showed the PF-PCO2 score was better at predicting survival (figure 1).

**Conclusions** PF-PCO2 better predicted survival without ECMO in infants with CDH compared to other published tools. Additional studies are needed to further validate the usefulness of this equation.

**Abstract 127 Table 1** Median predictive scores with interquartile range (IQR)

	Survival without ECMO (n=140)	Death/ECMO (n=91)	P
CDHSG-PS (Median, [IQR])	76% [61,85%]	56% [33,74%]	<0.001
WHSRpf (Median, [IQR])	+91 [+41,+164]	–29 [–53,+6]	<0.001
Brindle (Median, [IQR])	2 [1,2]	3 [2,3]	<0.001
PF-PCO2 (Median, [IQR])	+225 [+154,+270]	+3 [–30,+45]	<0.001

128

## RETROSPECTIVE ANALYSIS OF CLINICAL, LABORATORY AND IMAGING FINDINGS OF NEONATES WITH URINARY TRACT INFECTIONS

<sup>1</sup>A Iacob\*, <sup>2</sup>A Oyejemi, <sup>1</sup>G Truong. <sup>1</sup>Loma Linda Univ Children's Hospital, Loma Linda, CA; <sup>2</sup>Loma Linda Univ School of Medicine, Loma Linda, CA

10.1136/jim-2017-000663.128

**Purpose of study** Urinary tract infections (UTIs) are frequently encountered in the neonatal population. Guidelines for diagnosing and managing UTIs are evidence based for older children but not for neonates. We aim to characterise clinical, laboratory and imaging findings of neonatal UTIs.

**Methods used** A retrospective analysis of neonates hospitalised between January 1 2007 to January 1 2016 at the Loma Linda University Children's Hospital Neonatal Intensive Care Unit with a diagnosis of UTI was performed. Patients were then categorised in two groups: those with urine cultures of 10,000/+CFUs (the 10 K group –276 patients) and those with urine culture with 50,000/+CFUs (the 50 K group –168 patients). Patients with urine cultures <10,000 CFUs were excluded. The demographics, urine analysis (UA), urine culture, presence of fever, renal and bladder ultrasound (RBUS), voiding cystourethrogram (VCUG) findings for each group was performed and compared.

**Summary of results** The mean age of the 10 K group was  $33.7\pm5.7$  gestational weeks with males representing 75.7%, compared to was  $34\pm5.7$  and 77.4% in the 50 k group respectively. In both groups, over 80% of the patients were afebrile when the UTI diagnosis was made. In the 10 K group, the UA was negative for pyuria, nitrites, leukocytes in 78%, 92%, 61% of the cases, respectively compared to 81%,

86%, 46% in the 50 K group. In the 10 K group, RBUS findings revealed negative findings, moderate abnormalities and severe abnormalities in 45%, 37%, and 11% of the cases, respectively, compared to 36%, 47%, and 12% in the 50 K group. The sensitivity and specificity of the RBUS for a normal VCUG was 58% and 52%, respectively in the 10 K group, compared to 63% and 53% in the 50 K group. The NPV of a negative RBUS compared to a negative VCUG was found to be 87% in both groups. In the 10 K group, 16% of those who had VCUG showed significant VUR while that of the 50 K group was 18%.

**Conclusions** Majority of the neonates with a UTI will not manifest with a fever, as is expected for an older child. Additionally, the UA is not as reliable to make a diagnosis or decide to treat as a UTI given how often it was negative for the classic findings. Unfortunately, both the sensitivity and specificity of the RBUS remains poor when predicting VCUG results.

## 129 HOW FAMILY-CENTRED IS NEONATAL INTENSIVE CARE DELIVERY? A MEASUREMENT FRAMEWORK

<sup>1</sup>D Ravi\*, <sup>1</sup>K Sigurdson, <sup>2</sup>L Vernon, <sup>1</sup>J Profit. <sup>1</sup>Stanford University, Palo Alto, CA; <sup>2</sup>NICU Baptist Children's Hospital of Miami, Miami, FL

10.1136/jim-2017-000663.129

**Purpose of study** Family-centred care (FCC), an approach to neonatal intensive care delivery that engages families as active partners in the care of the infant, has been shown to improve multiple infant and family-centred outcomes. Although FCC is increasingly recognised as a standard of care, implementation varies across NICUs. Efforts to measure and improve FCC are currently hampered by the lack of validated assessment tools. The purpose of this study is to develop measures of FCC, that can be extracted primarily from the electronic health record, and can be used to assess and compare NICU performance on FCC.

**Methods used** We conducted a review of the literature to identify measure domains and specific practices of family-centred care in the continuum from infant admission to discharge from the NICU. In consultation with family representatives and clinical experts we generated a candidate list of measures that captured core attributes of FCC. Measures were specified according to guidelines of the National Quality Forum and rated by an expert panel in a Modified Delphi experiment that included two rounds of anonymous electronic surveys and an in-person meeting. The expert panel rated measures based on their importance, scientific soundness, usability and feasibility and the final set of measures were selected after testing for rater agreement using accepted criteria for quality measure development.

**Summary of results** Expert panel rated, prioritised and selected high quality measures in the domains of: family engagement; family participation in hands-on care; needs assessment and tailoring services to the individual circumstances of families, and coordinating care. Measures identified addressed specific practices such as family involvement in Kangaroo care as well as the ability of the NICU care delivery structure to assess individual family needs and respond effectively through provision of supportive services such as social work.

**Conclusions** We identified measures that assess core attributes of family-centred care in the NICU for use as benchmarking and quality improvement tools within and across NICUs.

130

## COMPUTATIONAL ASSESSMENT OF AEEG SLEEP WAKE CYCLES IN NEONATES WITH COMPLEX CONGENITAL HEART DISEASE

<sup>1</sup>D Hur\*, <sup>1</sup>P Pichon Zentil, <sup>2</sup>A Andrade, <sup>1</sup>L Tinsley, <sup>2</sup>J Tan, <sup>2</sup>CG Wilson, <sup>1</sup>AO Hopper, <sup>1</sup>DA Goff. <sup>1</sup>Loma Linda University Children's Hospital, Loma Linda, CA; <sup>2</sup>Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.130

**Purpose of study** Neonates with complex congenital heart disease (CCHD) are at risk for preoperative white matter injury which may affect sleep wake cycle (SWC) patterns. Since quantitative analyses can likely provide a more accurate assessment of SWCs, our objective was to perform a pilot study of computational analyses of preoperative aEEG SWCs in CCHD neonates.

**Methods used** We included singleton neonates >37 weeks gestational age (GA) with CCHD admitted to LLUCH's NICU (1/6/16–6/9/17) with preoperative aEEGs. A paediatric neurologist blinded to the clinical data reviewed aEEGs for background pattern, SWC categories (absent, immature, mature) and seizure activity. To validate aEEG SWC assessment, we used a Jupyter notebook (<http://jupyter.org/>) to assess summed root mean squared (RMS) voltages of beta, alpha, theta, delta, and gamma EEG bands in 4 hour epochs and compared the RMS data of the two SWC categories: absent/immature (n=9) and mature (n=14) using the Mann-Whitney U Test. Statistical analyses and plotting were performed using RStudio (<https://www.rstudio.com/>).

**Summary of results** A total of 23 CCHD neonates, 16/23 (70%) with two ventricle lesions had a mean GA 39.1±0.95 weeks, mean birth weight of 3341 g±361 g with aEEGs recorded at median day of life 1 (0–4). Continuous aEEG background was present in 16/23 (70%), discontinuous in 7/23 (30%) with seizure activity present in 3/23 (13%) neonates. Significant differences (p<0.05) were identified between beta, alpha, theta, delta and gamma waves comparing immature/absent (n=9) and mature (n=14) aEEG SWC cohorts.

**Conclusions** Our open-source Jupyter notebook allowed us to streamline the quantification of large amounts of raw aEEG data and correlate with aEEG SWC categories. We saw significant differences in all aEEG bands between immature/absent and mature aEEG SWC cohorts. Further analyses with a larger number of neonates are required to validate our findings.

## Neuroscience I

### Concurrent session

3:15 PM

Thursday, January 25, 2018

131

## TRAUMATIC BRAIN INJURY INDUCES CALPAIN-2 MEDIATED CLEAVAGE OF HSP70.1, A LYSOSOMAL STABILISATION PROTEIN

M Lee\*, Y Wang, X Bi, M Baudry. Western University of Health Sciences, Pomona, CA

10.1136/jim-2017-000663.131

**Purpose of study** Recent studies suggest the role of heat-shock protein 70.1 (Hsp70.1) in maintaining lysosomal membrane integrity. Destabilisation of lysosomes promotes programmed

cell death and is associated with progression of intracellular morphology relating to granulovacuolar degeneration, a pathological hallmark of Alzheimer's Disease (AD). Our laboratory previously identified a link between traumatic brain injury (TBI) and AD by showing that calpain-2 activation is involved in tau phosphorylation and oligomer accumulation. This study will investigate effects of TBI-induced calpain activation on Hsp70.1 and determine involvement of calpain-1 or calpain-2 in lysosomal stability.

**Methods used** Controlled cortical impact model of TBI was used on wild-type (WT) and calpain-1 KO (C1KO) C57Bl/6 mice. A 5 mm craniotomy was performed with anaesthesia, and a penetrating injury was induced on cortex lateral to the sagittal suture. Single injection of a selective calpain-2 inhibitor (C2I, 0.3 mg/kg) was made intraperitoneally 1 hour after TBI. For sham surgery, mice were subjected to craniotomy only. Brains were isolated 24 hour after TBI and cortical tissue surrounding injury was homogenised in homogenization buffer containing a protease and phosphatase inhibitor cocktail. After two rounds of centrifugation, P2 membrane (pellet) fraction was resuspended in lysis buffer. Primary antibody for western blot (WB) was Hsp70.1 (1:3000).

**Summary of results** WB showed breakdown products of Hsp70.1 after TBI with apparent Mw of 50, 37 and 25 kDa. Quantification of WB indicated that ratio of breakdown products to full-length Hsp70.1 was significantly higher in WT and C1KO mice after TBI, as compared to sham ( $n=3$  animals.  $p<0.05$  sham vs WT.  $p<0.01$  sham vs C1KO). Post-TBI injection of C2I appeared to prevent Hsp70.1 truncation.

**Conclusions** TBI resulted in rapid calpain-2-mediated Hsp70.1 truncation, as selective inhibition of calpain-2 decreased Hsp70.1 cleavage, which was evident in absence of calpain-1. Our results support the critical role of calpain-2 in neuronal death and provide an additional link between TBI and AD through calpain-2-mediated cleavage of Hsp70.1, and resulting lysosomal destabilisation.

### 132 AGE-DEPENDENT CHANGES IN P18 EXPRESSION IN BRAIN OF WILD-TYPE AND ANGLEMAN SYNDROME MICE

<sup>1</sup>J Wong\*, <sup>1</sup>J Sun, <sup>1</sup>W Lin, <sup>1</sup>X Hao, <sup>1</sup>J Tran, <sup>1</sup>K Law, <sup>2</sup>M Baudry, <sup>1</sup>X Bi. <sup>1</sup>College of Osteopathic Medicine of the Pacific, Pomona, CA; <sup>2</sup>Graduate College of Biomedical Sciences, Western University of Health Sciences, Pomona, CA

10.1136/jim-2017-000663.132

**Purpose of study** Angelman Syndrome (AS) is a neurodevelopmental disorder caused by deficiency in UBE3A, a ubiquitin E3 ligase, which targets proteins for degradation. Although the genetic cause for AS has been known for decades, how UBE3A deficiency leads to brain dysfunction remains largely unknown. Our previous research has shown that over-activation of mTORC1 contributes to AS pathogenesis in an AS mouse model. mTOR is an evolutionally conserved protein kinase whose full activation requires lysosomal recruiting through interaction with p18. We therefore investigated changes in localization and levels of p18 in brains of both wild-type (WT) and AS mice as a function of age.

**Methods used** Brains of male WT and AS mice were harvested at ages 1, 2–4, and 6–8 months, and sliced into 20 micrometre coronal sections. Brain sections were processed for immunohistochemistry with antibodies against p18 and LAMP2, a lysosomal membrane protein. Images of different brain regions, including

the hippocampal CA1 region, were acquired with a confocal microscope. P18 expression and co-localization with LAMP2 in both soma and dendrites were quantified with ZEN software and analysed with Prism software.

**Summary of results** Our preliminary results showed that levels of lysosome-localised p18 in the soma of hippocampal CA1 neurons were significantly higher in AS mice from all age groups, as compared to WT mice. Although levels of lysosome-localised p18 in apical dendrites of hippocampal CA1 neurons were also significantly increased in AS mice, as compared to WT mice in the 2–4 month groups, differences in other age groups were not significant.

**Conclusions** These preliminary results confirmed our unpublished Western Blot results that p18 levels in hippocampus of young adult AS mice were increased, as compared to WT mice. These results also indicated that the increased p18 expression is mostly localised on lysosomes. They also suggest that changes in p18 expression could participate in the post-natal development of pathology in AS, as well as its persistence in adulthood. Whether increased p18 levels contribute to mTOR lysosomal recruiting and activation in AS mice is currently under investigation.

### 133 THE EFFECTIVENESS OF RIBOFLAVIN (VITAMIN B2) IN PREVENTING MIGRAINE EPISODES IN THE PAEDIATRIC POPULATION: A COMPREHENSIVE REVIEW

<sup>1,2</sup>J Arora\*, <sup>2,3</sup>M Jeon, <sup>2,3</sup>Y Marvasti, <sup>2,3</sup>E Holz, <sup>2,3</sup>S Yuvaraj, <sup>2,3</sup>L Morris, <sup>2,3</sup>B Afghani. <sup>1</sup>University of California, Berkeley, Berkeley, CA; <sup>2</sup>University of California, Irvine, Irvine, CA; <sup>3</sup>Children's Hospital of Orange County, Orange, CA

10.1136/jim-2017-000663.133

**Purpose of study** While prescription medications such as triptans and non-steroidal anti-inflammatory drugs are available and used to treat migraine headaches, they have many side effects and remain inconvenient as prescription medication. Information on use of riboflavin for migraine prophylaxis in children is scant. The purpose of this study was to evaluate the effectiveness of a non-prescription alternative, riboflavin in prevention of migraine episodes in children and adolescents.

**Methods used** A search of Pubmed, Google Scholar, and the review of reference list of articles was conducted to find clinical studies that evaluated the effectiveness of riboflavin for prophylactic treatment of migraine headaches. Only studies that used riboflavin as a sole prophylactic agent in patients less than 19 years of age with a control group were included in our analysis.

**Summary of results** Four studies that met the inclusion criteria were used in this review (please see table 1 below). All studies used the International Headache Society criteria to diagnose migraines. The duration of follow-up ranged from 3 to 6 months. The dosage of riboflavin ranged from 50 mg/day to 400 mg/day. In two of the four studies the riboflavin group had a significant decrease in severity, duration and frequency of migraines. The studies that showed an improvement in the riboflavin group used a dosage of 200–400 per day and included a larger sample size.

**Conclusions** Our review suggests that riboflavin at higher dosages of 200–400 mg/day for 2 to 3 months may be effective in reducing severity and/or frequency of migraine headaches in children. Future large prospective randomised trials controlling for different kinds of migraines and other variables are needed to evaluate the effectiveness of riboflavin for prophylaxis of paediatric migraines.



Abstract 133 Table 1

First author and year and location	Study type	Age range of patients	Number of patients in control	Number of patients in treatment	Dosage of riboflavin	Severity of migraine	Decrease in frequency or duration
Athaillah, 2012 Indonesia	Randomised Double Blind	12–19 years	48	50	400 mg daily	Reduction in severity in 94% of Riboflavin Group vs 14.6% of controls after 3 months*	0% in Riboflavin vs 38% of controls had HA more than 2 hours*
Bruijn, 2010 Netherlands	Randomised Double Blind- Cross Over	6–13 years	22	20	50 mg daily	Frequency 1.55/month in Riboflavin vs 1.66/month of controls (p=0.44)	Decrease in tension phenotype in favour of Riboflavin group*
Condo, 2010 Italy	Retrospective	8–18 years	Patients compared to baseline	40	200 or 400 mg daily	Severity decreased from 2 to 1.4 after 3 months*	Frequency decreased from 23.4 to 8.9 after 3 months*
MacLennan, 2008 Australia	Randomised Double Blind	5–15 years	21 children	27 children	200 mg daily	No difference in severity in the 2 groups	50% decrease in 44% of riboflavin vs 67% of placebo (p=0.125)

\*P value

### 134 LIPOPROTEIN LIPASE: EXPLORING A NOVEL MICROGLIAL PHENOTYPE THAT SUPPORTS REMYELINATION IN THE CNS

BA Loving\*, K Bruce, S Gorkhali, R Eckel. *University of Colorado, Aurora, CO*

10.1136/jim-2017-000663.134

**Purpose of study** Multiple Sclerosis (MS) is a severe demyelinating disorder of the central nervous system (CNS) that affects 2.5 million people worldwide. It has been suggested that microglia modulate the de- and re-myelination processes through polarisation into either a pro-inflammatory—associated with increased glycolysis and reduced fatty acid oxidation (FAO)—or anti-inflammatory reparative phenotype. We have previously shown that Lipoprotein Lipase (LPL), the rate-limiting enzyme in the hydrolysis of triglyceride-rich lipoproteins is expressed in the peripheral nervous system and is elevated following nerve crush injury. Thus, we hypothesise that LPL may scavenge and reutilize myelin-derived lipids to aid remyelination in the CNS. The purpose of this study is to determine the role of microglial LPL in inflammation and lipid-processing.

**Methods used** We generated BV-2 murine microglial cell lines with either depleted (LPL KO) or endogenous (WT) levels of LPL. mRNA was isolated, and cDNA generated for qPCR to quantify the expression of genes associated with inflammation and cellular lipid processing. Cells and media from both LPL KO and WT BV-2 microglia were then processed for metabolomics analysis.

**Summary of results** Compared to WT, LPL KO cells showed decreased expression of lipid scavenger protein *SR-B1* (−6 fold,  $p<0.001$ ) as well as decreased expression of nuclear lipid sensor/transcription regulator protein *PPARδ* (−4 fold  $p<0.05$ ). LPL deficient cells exhibited an increased expression of pro-inflammatory marker *iNOS* (+53 fold,  $p<0.001$ ) and decrease in anti-inflammatory marker *Arg1* (−265 fold,  $p<0.001$ ). Metabolomic analysis revealed multiple increased intracellular glycolytic metabolites, such as D-Fructose 1–6 BP (+3 fold,  $p<0.0005$ ) and decreased FAO metabolite L-Carnitine (−2 fold,  $p<0.00005$ ).

**Conclusions** In summary, LPL KO cells showed increased glycolytic metabolites and decreased FAO metabolites, along with decreased lipid processing gene expression. These data suggest that LPL is needed to prioritise fatty acid oxidative

metabolism over glucose metabolism. LPL KO cells also exhibited increased *iNOS* and decreased *Arg1*, suggesting that LPL supports an anti-inflammatory microglial phenotype. Taken together, LPL is a key feature of a reparative microglial phenotype that prioritises lipid-processing.

### 135 BRAIN-DERIVED NEUROTROPHIC FACTOR POLYMORPHISM MODIFIES THE EFFECTS OF DEVELOPMENTAL ETHANOL EXPOSURE

AJ Marks\*, CW Bird, JJ Mayfield, GJ Chavez, BC Baculis, CF Valenzuela. *University of New Mexico School of Medicine, Albuquerque, NM*

10.1136/jim-2017-000663.135

**Purpose of study** Fetal Alcohol Spectrum Disorder (FASD) is caused by *in utero* exposure to ethanol (EtOH) and is a leading cause of cognitive deficits. Brain-derived neurotrophic factor (BDNF) plays an integral role in neuronal development and may counteract some of the effects of developmental EtOH exposure. The val66Met missense mutation within the coding region of BDNF gene decreases BDNF secretion. The purpose of this study was to determine if there was an interaction between developmental EtOH exposure and the val66-met BDNF polymorphism.

**Methods used** Timed pregnant transgenic dams homozygous for either valine (BDNF<sup>val/val</sup>) or methionine (BDNF<sup>met/met</sup>) in residue 68, homologous to residue 66 in humans, were exposed to increasing concentrations of vaporised EtOH from gestational day 12 to 19, and again with pups on postnatal days (P) 2 to 9. On P15, P50, and P90 mice were perfused transcardially with paraformaldehyde and brains were processed for immunohistochemistry, including sectioning at 50 µm, parasagittally. Hippocampal volumes were assessed in sections stained with the nuclear dye DAPI using unbiased methods. Adult neurogenesis was assessed at P90 with Doublecortin (DCX) staining and counted with unbiased stereology. Anxiety-like behaviour was assessed using an elevated zero maze at P80. Learning and memory was assessed at P90 using trace fear conditioning.

**Summary of results** During P15, EtOH exposure reduced hippocampal volume in the dentate gyrus (DG) ( $p=0.029$ ) and the CA1 region ( $p=0.027$ ) of BDNF<sup>met/met</sup> but not BDNF<sup>val/val</sup> male mice; similar effects were seen in BDNF<sup>met/met</sup> female

cohorts in DG ( $p=0.027$ ) and CA1 ( $p=0.029$ ). During P90, EtOH exposure reduced anxiety-like behaviour ( $p=0.021$ ) and learning and memory ( $p=0.0033$ ) in BDNF<sup>met/met</sup> male mice. Ethanol exposure reduced adult neurogenesis only in the ventral hippocampus of BDNF<sup>val/val</sup> male mice ( $p=0.042$ ).

**Conclusions** Here, we suggest a novel interaction between developmental EtOH exposure and BDNF<sup>met/met</sup>. Specifically, BDNF<sup>met/met</sup> increased the effects of EtOH on hippocampal morphology and hippocampal-dependent behaviours. These findings suggest that screening for this polymorphism may have some value in predicting FASD severity.

### 136 COMPLICATION TYPE AND NUMBER PREDICT FAILURE TO RESCUE RATE IN TRAUMA PATIENTS

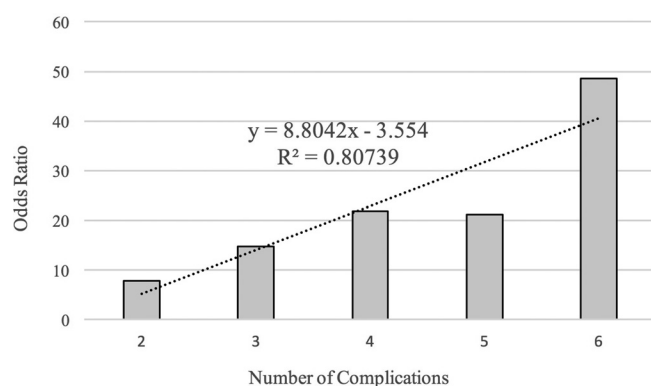
<sup>1</sup>A Roussas\*, <sup>2</sup>F Jehan, <sup>2</sup>M Khan, <sup>2</sup>B Joseph. <sup>1</sup>University of Arizona College of Medicine – Tucson, Tucson, AZ; <sup>2</sup>Banner University Medical Centre, Tucson, AZ

10.1136/jim-2017-000663.136

**Purpose of study** Failure to rescue (FTR) is defined as death from a complication. No data exists regarding what type of complications are highest risk for FTR or if a relationship between number of complications and risk for FTR exists. We hypothesise that respiratory and infectious complications will independently predict higher rates of FTR and that there will be a positive relationship between complication number and FTR.

**Methods used** We conducted a retrospective cohort study of patients in the Trauma Quality Improvement Program Database. Patients were included if they developed a complication and were admitted for >1 day. Patients were divided into two groups: 'FTR' if the patient died after developing complication or 'Rescued' if the patient was rescued. Binomial logistic regression was used to test our hypotheses.

**Summary of results** A total of 972 patients were identified as FTR and 24 782 as rescued. Mean age was  $54.5 \pm 21.9$  years, male gender was 56.1%, percent blunt injury was 92.6%, median ISS was 9. Sepsis ( $p<0.001$ , OR [95% CI]=6.01 [4.72–9.27]), pneumonia ( $p<0.001$ , OR [95% CI]=2.41 [2.15–3.63]), ARDS ( $p<0.001$ , OR [95% CI]=2.99 [3.12–6.69]), and cardiovascular (CV) complications ( $p<0.001$ , OR [95% CI]=19.36 [19.39–30.26]) were independent risk factors. There was a linear 8.8% increase in odds for every single increase in complication ( $r^2=0.81$ ).



**Abstract 136 Figure 1** Odds ratio for increasing numbers of complications

**Conclusions** Sepsis, pneumonia, ARDs, and CV complications may increase one's odds of FTR 6.01, 2.41, 2.99, and 19.36 times, respectively, and a patient's odds of FTR increases linearly with complication number. Our data warrants extra precaution with certain complications and establishes a relationship between odds of FTR and complication number.

### 137 EVALUATION AND IMAGING OF PAEDIATRIC MACROCEPHALY IN A SINGLE TERTIARY CARE CENTRE

<sup>1</sup>AK Butler\*, <sup>2</sup>J Metz, <sup>2</sup>B Siebold, <sup>2</sup>R Farris, <sup>2</sup>K Feldman, <sup>2</sup>E Gallagher. <sup>1</sup>University of Washington School of Medicine, Seattle, WA; <sup>2</sup>Seattle Children's Hospital, Seattle, WA

10.1136/jim-2017-000663.137

**Purpose of study** Macrocephaly, occipitofrontal circumference (OFC) >2 standard deviations above the mean, is a common finding in paediatric patients that often prompts referral for subspecialty evaluation or imaging. Many causes of macrocephaly are benign, but macrocephaly may indicate a more serious condition (e.g., hydrocephalus, child abuse/trauma, metabolic/genetic conditions, or neoplasia). There are few current guidelines for evaluating children with macrocephaly. This study examines the evaluation of patients <2 years of age with macrocephaly at a single tertiary care centre and investigates whether there are differences in the types of imaging studies ordered by providers in different specialties.

**Methods used** This retrospective cohort study includes 929 patients <2 years of age with macrocephaly who were referred for evaluation in neurosurgery, craniofacial medicine, neurology, or other specialties at a single institution between January 2012 and June 2017. Information collected included demographics, family and medical history, and clinical presentation. Primary outcomes included imaging studies and results.

**Summary of results** 81.2% of the cohort received imaging for macrocephaly; 34.3% received CT, 36.8% received MRI, and 40.2% received ultrasound. Common findings on imaging were benign enlargement of the subarachnoid spaces, prominent ventricles, and prominent extraaxial fluid. 6.8% of patients required intervention for macrocephaly: surgery or removal from parents' custody for abusive head trauma. 83.2% of all patients evaluated by neurosurgery received a CT scan, compared to 13%–29% in other specialties. Of patients with macrocephaly who were evaluated by neurosurgery and did not have other significant history or physical exam findings, 86.8% still received a CT scan, compared to 4%–11% in other specialties. 80.8% of patients referred directly for imaging by a primary care provider received ultrasounds, while significantly fewer patients received ultrasounds from other specialties.

**Conclusions** Sizable differences in the types of imaging received by patients with macrocephaly exist between specialties at this institution, even for patients without significant history and exam findings. Evidence-based imaging guidelines should be developed.

138

# COMPARING THE EFFICACY OF PRINT VERSUS MEDIA BASED PATIENT EDUCATION MATERIALS IN ONQ PERIPHERAL NERVE CATHETER EDUCATION FOR CAREGIVERS

HB Parikh\*, A Gagliardi, JC Albright, TN Mandler. *University of Colorado School of Medicine, Aurora, CO*

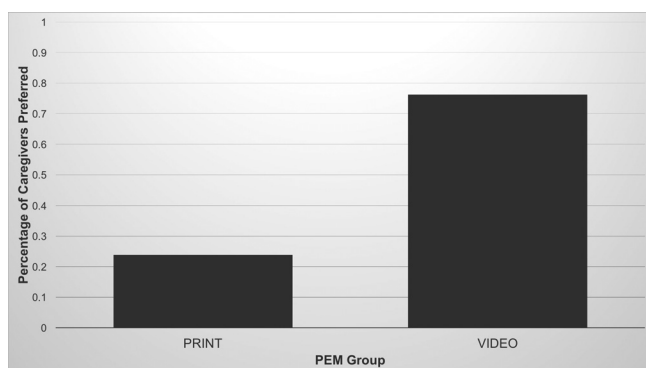
10.1136/jim-2017-000663.138

**Purpose of study** The purpose of this study is to determine whether print-based patient education materials (PEMs) or media-based PEMs are more efficacious in providing caregiver education, and assess caregiver preference for one PEM mode over another.

**Methods used** This prospective, randomised study includes caregivers of paediatric patients undergoing ACL Reconstruction surgery at Children's Hospital Colorado. Subjects were assigned to review either a handout (print-based PEM) or a three-minute video (media-based PEM) on the OnQ peripheral nerve catheter, a device used to control postoperative pain. Both PEMs contain the same information regarding catheter management and removal. The caregiver subsequently completed a standardised assessment on the education materials and a survey 24 hours postoperatively to assess caregiver satisfaction and preference with the assigned PEM.

**Summary of results** Standardised assessment results indicate an average of 9.25 and 9.5 (out of 10) for caregivers in the print-based and media-based groups, respectively. Preliminary results show 76% of caregivers (16/21) preferred the media-based PEM in initial education. We are continuing data collection and expect to include thirty patients within the next two months.

**Conclusions** Preliminary data suggests no apparent difference in efficacy between the media-based PEM and the print-based PEM. These preliminary results suggest that media-based PEMs may result in better caregiver satisfaction, as 72% stated that the video PEM was preferred in understanding how to manage their child's OnQ peripheral nerve catheter at home.



**Abstract 138 Figure 1** Preliminary results (n=21) regarding caregiver preference of one PEM mode over the other. Data was collected from a survey and reported as percentage preferred among the total caregiver

## Pulmonary and critical care I

### Concurrent session

3:15 PM

Thursday, January 25, 2018

139

# RATIO OF ALVEOLAR VENTILATION TO TOTAL LUNG CAPACITY (VA/TLC) IS AN INDEPENDENT MARKER OF COPD SEVERITY

PH Teckchandani\*, BT Kuhn, R Harper. *UC Davis Medical Centre, Sacramento, CA*

10.1136/jim-2017-000663.139

**Purpose of study** Pulmonary function testing (PFT) is commonly performed to quantify severity of chronic obstructive pulmonary disease (COPD). PFT measures, such as forced expiratory volume at 1 s (FEV1) and forced vital capacity (FVC), poorly predict clinical outcomes. The ratio of alveolar ventilation (VA, a single-breath assessment of the diffusing capacity of lungs for carbon monoxide) to total lung capacity (TLC, measured using body plethysmography over multiple breaths) has been described as a measure for inhomogeneous ventilation. In healthy lungs, VA should equal TLC. In patients with COPD, VA is often less than TLC, since the patient can exhale only a small portion of the lung volume during the single-breath manoeuvre. Very few studies have assessed correlation between VA/TLC and clinical outcomes. Before analysing for clinical outcomes, we hypothesise that VA/TLC is independent of FEV1, contrary to the very few studies stating a very strong correlation.

**Methods used** We obtained IRB approval for a retrospective analysis of all PFTs performed at UC Davis between 2010 and 2014 that met criteria for moderate to severe obstruction (defined as FEV1/FVC <0.7 and FEV1 <0.8), age over 40 years. This led to a cohort of 583 subjects. Linear correlation using Pearson product-moment correlation coefficient compared VA/TLC to numerous PFT measures, including FEV1 and FVC.

**Summary of results** Mean FEV1 of the cohort was 57.6% predicted. Mean VA/TLC was 0.66 with ratios below the normal range in patients with known COPD. Those with severe obstruction had VA/TLC ranging from 0.25 to 0.75. FEV1 correlated with VA/TLC with a coefficient of 0.64. VA/TLC was also compared to other measures of lung obstruction with similar correlations noted.

**Conclusions** A positive correlation exists between VA/TLC and FEV1, but the strength of this association is moderate, instead of the strong, linear one reported by very few prior studies, which had discouraged analysis correlating VA/TLC and clinical outcomes. Our group is currently collecting clinical data to

study the correlation of VA/TLC with clinical outcomes such as hospitalisation, mortality, and ICU admission. We feel this measurement can positively impact the clinical care of patients with severe COPD.

140

# PRECISION AND CONSISTENCY OF THE PASSIVE LEG RAISE IN DETERMINING FLUID RESPONSIVENESS

JM Thompson\*, S Chopra, S Shahangian, D Moretta, K Yaqub, S Thapamagar, H Nguyen. Loma Linda University, Redlands, CA

10.1136/jim-2017-000663.140

**Purpose of study** The passive leg raise (PLR) has been shown to be accurate in guiding fluid management by assessing changes in stroke volume. In this study we investigate the precision and consistency of determining fluid responsiveness by serial PLR using NiCOMTM (Cheetah Medical, Newton, MA).

**Methods used** This study is a single-centre, prospective observational cohort of healthy volunteers and intensive care unit (ICU) patients who were considered for volume expansion. Fluid responsiveness was defined as increase in stroke volume index (SVI)  $\geq 10\%$  ( $\Delta SVI \geq 10\%$ ) after PLR. Three repeated measures of  $\Delta SVI$  in response to PLR were determined, each 20 to 30 min apart. Precision was defined by the average deviation of  $\Delta SVI$  from the mean of 3 repeated measures. Consistency was defined by  $\Delta SVI \geq 10\%$  or  $\leq 10\%$  in all 3 repeated measures. In patients, no change in treatments, such as fluid bolus or vasopressor titration, occurred during the data collection period.

**Summary of results** Forty-nine subjects were enrolled, including 18 volunteers and 31 patients. Volunteers were age  $29.1 \pm 4.8$  years, 11 males (58%), and body mass index  $22.51 \pm 1.58$  kg/m<sup>2</sup>. Patients were age  $48.5 \pm 7.0$  years, 11 males (35%), and body mass index  $25.29 \pm 2.65$  kg/m<sup>2</sup>. Patients had a Sequential Organ Failure Assessment (SOFA) score  $6.5 \pm 1.8$ , with 10 (32%) patients on vasopressor support, 10 (32%) admitted for sepsis and 17 (56%) required mechanical ventilation. For healthy volunteers, cardiac index (CI) was  $3.51 \pm 0.23$  L/min/m<sup>2</sup>, with SVI  $56.87 \pm 4.22$  ml. Serial PLR's resulted in a mean  $\Delta SVI$  of  $34.63\% \pm 7.82\%$  with a precision of  $6.43\% \pm 1.76\%$ . Patients had CI  $3.41 \pm 0.35$  L/min/m<sup>2</sup>, with SVI  $35.05 \pm 3.45$  ml. Serial PLR's resulted in a mean  $\Delta SVI$  of  $14.16\% \pm 6.68\%$  and a precision of  $4.82\% \pm 1.16\%$ . Consistency of  $\Delta SVI$  was observed in 20 (65%) patients and 17 (94%) healthy volunteers. Of the 20 patients and 17 healthy volunteers who had consistent results, 11 (55%) and 17 (100%), were fluid responsive, respectively.

**Conclusions** The precision and consistency of PLR in determining  $\Delta SVI$  by NiCOMTM may be a limiting factor in its use as a determinant of fluid responsiveness in ICU patients.

141

# FROM SARCOIDOSIS TO LYMPHOMA: A TALE OF TROUBLESOME TRANSFORMATION

PH Teckchandani\*, R Harper. UC Davis Medical Centre, Sacramento, CA

10.1136/jim-2017-000663.141

**Introduction** Sarcoidosis affects 36 per 100,000 African Americans, and 11 per 100,000 Caucasian Americans. A few case reports have associated sarcoidosis and lymphoma, with no

pathway of causality defined, let alone postulated. We describe the case of a middle-aged woman with known sarcoidosis who developed pulmonary lymphoma.

**Description** The patient is a 52-year-old woman who initially presented with fatigue and abdominal pain. Physical exam revealed splenomegaly and laboratory tests showed elevated alkaline phosphatase, angiotensin converting enzyme (123 U/L), and calcium (14 mg/dL) levels. CT chest/abdomen/pelvis demonstrated lung nodules and mediastinal lymphadenopathy. Trans-bronchial biopsy revealing non-caseating granulomas confirmed the diagnosis of sarcoidosis. A prolonged taper of steroids over an eight-month period resulted in resolution of symptoms and lab abnormalities (normocalcemia).

Approximately 10 months later, the patient reported new symptoms of night sweats, left arm pain, metallic taste, and cramping of her feet. Repeat bloodwork showed serum creatinine of 3.52 mg/dL (baseline 1 mg/dL), and calcium of 15.1 mg/dL. She was hospitalised for treatment of hypercalcemia. CT abdomen revealed splenomegaly and diffuse, numerous enlarged upper abdominal lymph nodes. CT chest showed chronic interstitial lung disease, two new RUL irregular nodules, and peri-cardiac lymphadenopathy. Endoscopic ultrasound-guided biopsy of peri-portal lymph nodes revealed CD5 +B cell lymphoproliferative disease. Hydroxychloroquine and Prednisone were started for sarcoidosis, and patient was discharged with Haematology follow-up for stage IV lymphoma.

**Discussion** The observed relationship between sarcoidosis and lymphoma suggests a possible shared pathophysiology. Sarcoidosis is caused by inappropriately regulated cytokine and chemokine signalling, leading to tumour necrosis factor-mediated proliferation of T-helper 1 cells, causing granuloma formation. Similar cytokine-mediated dysregulation occurs in neoplastic proliferation of B- or T- cells, leading to lymphoproliferative disorders. The underlying mechanism has yet to be elucidated, but it appears that inappropriate cell regulation, leading to inflammation, may be one to explore.

142

# DIAGNOSING PNEUMONIA WITH COMPUTED TOMOGRAPHY ATTENUATION

T Suner\*, R Edwards, G Kicska. University of Washington School of Medicine, Seattle, WA

10.1136/jim-2017-000663.142

**Purpose of study** Computed Tomography (CT) attenuation value (HU) of pulmonary consolidations on contrast-enhanced chest CT can be used to diagnose pneumonia and distinguish it from atelectasis. Although this method is effective, it fails to diagnose ~10% of pneumonia cases. We aimed to improve the accuracy of this method by establishing additional imaging markers to aid the diagnosis of pneumonia or adjust the HU threshold used to distinguish pneumonia from atelectasis.

**Methods used** Computed Tomography Pulmonary Angiogram (CTPA) and Computed Tomography Venous Phase (CTV) included in the study were classified as pneumonia or atelectasis based on four criteria: fever/cough, leukocytosis, antibiotic treatment for pneumonia, and documentation of pneumonia as a discharge diagnosis. Two or more points qualified the study as pneumonia, otherwise the study was classified as atelectasis. Regions of interest were drawn on areas of consolidated lung, normal lung, and the pulmonary veins. Each scan was examined for nodules, airway opacification, and for parenchymal



ground glass opacities. Continuous values were compared with a students t-test. The influence of BMI and contrast on HU attenuation was assessed with linear regression.

**Summary of results** A total of 62 CTPA and 107 CTV exams with pulmonary consolidations were included in the study. CT attenuation predicted the diagnosis of pneumonia or atelectasis with 89% accuracy on CTPA and 93% accuracy on CTV. The optimal threshold was 85 and 75 HU respectively. Pulmonary consolidation attenuation for both groups was not affected by contrast volume or BMI. Pneumonia exams had a higher percentage of ground glass (GGO) below the carina compared to atelectasis exams (13.2% vs 8.5%,  $p < 0.01$ ). There was no difference in GGO above the carina in both groups. The nodule index was significantly greater in pneumonia vs atelectasis (0.32 vs 0.11,  $p < 0.01$ ).

**Conclusions** CT attenuation can accurately diagnose atelectasis or pneumonia on both CTPA and CTV images. Patient BMI or contrast dose does not influence the CT optimal attenuation threshold. GGO below the carina is more common in pneumonia than atelectasis. Nodules are more common in pneumonia compared to atelectasis. These two radiographic features may be used in a predictive model of diagnosis to improve accuracy of contrast enhanced diagnosis of pneumonia or atelectasis.

#### 143 CHAIR YOGA: COMBATING CHRONIC RESPIRATORY DISEASE AND IMPROVING PULMONARY FUNCTION

H Mueller\*. *University of Washington, Moscow, ID*

10.1136/jim-2017-000663.143

**Purpose of study** Chronic respiratory disease is an ongoing problem in Weiser, Idaho and is the third leading cause of death in that county. Currently, 27% of residents at Kindred Nursing and Rehabilitation in Weiser suffer from chronic respiratory illness, and there is a broad range of physical activity that they can endure. Net household income in Weiser is about \$19 000 under the average state income with a 17% smoking rate.

**Methods used** Conversation with the Community Health Educator noted that many community members cannot afford to go to a gym or live too far out of town to go regularly. Yoga can accommodate a range of ability levels and requires little equipment, so a literature review was performed to verify its effectiveness for use in people with respiratory illnesses. Studies showed improvement in pulmonary function tests by utilizing specific *asanas* and *pranayamas*, and chair yoga was noted to be beneficial for more restricted individuals. Three *asanas* and three *pranayamas* were put together into a document with instructional photos and directions. A chair yoga video was created with the help of a chair yoga instructor that has 20 years of experience and a newspaper ad promoting the new additions of chair yoga to the local wellness classes was designed.

**Summary of results** The ad and instructional photos with directions were given to the local Wellness Class Director and no new resources were needed; the only equipment required is a chair. She was also given the yoga video to give to members that live further out of town. The *asanas* and *pranayamas* were implemented into an activity session at the Kindred

Nursing and Rehabilitation Centre with participation by approximately 12 residents; the Activity Director at Kindred also received a copy of the video and written directions for reference.

**Conclusions** The implementation of chair yoga into the Kindred Nursing and Rehabilitation Centre was successful in that there was verbal confirmation by the Activity Director that the movements would continue to be utilised in daily activities. The local Wellness Class Director also confirmed that she would utilise the exercises in her biweekly classes. As chair yoga begins to get more attention as a beneficial exercise for people with chronic respiratory illness, a class devoted to the practice can be created in Weiser.

#### 144 A CASE OF SCHISTOSOMIASIS MANSONI AND PULMONARY COCCIDIOIDOMYCOSIS CO-INFECTION

GV Dalben\*, A Heidari, J Patel. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.144

**Purpose of study** Schistosomiasis *mansoni* is a parasitic infection endemic to Africa, South America and the Caribbean. Eggs get excreted in stools into fresh water, hatch into motile miracidia, and infect snails. After developing in the snails, cercariae emerge and penetrate the human skin in the water. The cercariae pass through lungs to the liver to mature, mate, and pass down into mesenteric venules to begin egg production. Schistosome eggs trapped in tissues produce granulomatous reactions, fibrosis, and obstruction. Communicability lasts as long as live eggs are excreted in the urine/faeces. Incubation period is around 4 weeks. Adult worms may live up to 26 years in human hosts. Coccidioidomycosis (Cocci) is caused by a dimorphic fungus endemic to the southwestern United States, portions of Mexico, and regions in Central and South America. It is transmitted by inhalation of airborne spores and most infections are primarily in the lungs. The purpose of this case report is to illustrate a unique case of Schistosomiasis *mansoni* and Cocci co-infection.

**Methods used** Retrospective chart review.

**Summary of results** This is a 54-year-old Hispanic male who presented to our hospital complaining of a 2 week history of cough, fever, and shortness of breath. He has been a field worker in Mexico and the Central Valley California without any other travel history. Chest x-ray and CT scan showed consolidation of the lingular segment of the left lobe, adjacent satellite and centrilobular nodules, tree bud opacities in the right mid and lower lobes, and both mediastinal and hilar lymphadenopathy. Initial laboratory showed absolute eosinophil count of 1400. Further workup had a positive immunodiffusion Cocci IgG, IgM and CF of 1:16. Sputum smear showed several parasitic eggs consistent with *Schistosoma mansoni*. The patient was discharged on prolonged course of fluconazole for pulmonary Cocci. Later on, his sputum culture also came back as *Coccidioides immitis*. Subsequently, the patient's stool was sent for ova and parasite and is going to follow up in clinic to decide on his treatment for schistosomiasis.

**Conclusions** This is a unique case of pulmonary Cocci and Schistosomiasis *mansoni* co-infection. Clinicians in endemic areas should be aware of either one or both of these infections.

145

# BRONCHOPULMONARY ASPERGILLUS TUBERGENSIS AND COCCIDIOIDOMYCOSIS AFTER AN OCCUPATIONAL EXPOSURE

K Galang\*, A Karapetians, A Heidari. Kern Medical, Bakersfield, CA

10.1136/jim-2017-000663.145

**Purpose of study** *Aspergillus* and Coccidioidomycosis (cocci) are both environmental fungi that cause pulmonary disease. *Aspergillus* syndromes have a broad clinical spectrum including pulmonary aspergilloma, chronic necrotizing/invasive pulmonary aspergillosis in the immunosuppressed, or allergic bronchopulmonary aspergillosis. Pulmonary cocci can present with a variety of pulmonary symptoms. Voriconazole has activity against both cocci and aspergillosis. The following is an acute case of bronchopulmonary Aspergillosis in an immunocompetent host with positive cocci serology. There are only a few cases of *Aspergillus tubergensis* infection in humans reported, none of which are co-infected with cocci.

**Methods used** Retrospective case report.

**Summary of results** 45-year-old Hispanic male with alcohol abuse presented with non-productive cough and dyspnea for 2 days after significant dust exposure. He worked as a filed labourer in the San Joaquin Valley of California operating machinery cultivating grapes and yielding exposure to dust. On presentation he was hypoxic with a non-productive cough on inspiration and rales in the right lung field. Chest X-ray revealed patchy alveolar densities in the right mid-lung and left upper lobe (LUL). On chest CT, he had a LUL pulmonary nodule, mediastinal and bilateral hilar adenopathy, and scattered alveolar densities. Due to suspicion of pulmonary cocci, therapy with liposomal amphotericin B and steroids was initiated. Cocci serology was significant for very weakly reactive IgG, non-reactive IgM, and complement fixation titer of <1:2. Sputum culture grew young fungus that was later identified as *Aspergillus spp.* Serum IgE levels were elevated, (1–3)- $\beta$ -D-Glucan Ag and *Aspergillus* Ag were both positive. Bronchial washing and broncho-alveolar lavage both grew *A. tubergensis*. Amphotericin was switched to voriconazole to cover both Aspergillosis and cocci.

**Conclusions** *Aspergillus tubergensis* is a rare human pathogen particularly in immunocompetent host. Exposure to field dust in the endemic area of coccidioidomycosis might infect a susceptible host to both.

146

# RECURRENT PNEUMONIA AND OCCULT ASPIRATION

<sup>1</sup>J Ahn\*, <sup>2,3</sup>M Varghese, <sup>2,3</sup>SL Baer. <sup>1</sup>Medical College of Georgia at Augusta University, Augusta, GA; <sup>2</sup>Charlie Norwood VA Medical Centre, Augusta, GA; <sup>3</sup>Augusta University Medical Centre, Augusta, GA

10.1136/jim-2017-000663.146

**Case report** Pneumonia is a leading cause of hospitalisation and mortality among older adults. Risk of aspiration pneumonia increases with age, and recurrent pneumonia in elderly patients may be related to occult aspiration secondary to dysphagia and dystussia. We report the case of a 71 year old male with delayed recognition of chronic, occult aspiration with recurrent, polymicrobial pneumonia.

The patient was admitted with altered mental status and intractable nausea and vomiting. In the past six months, he had been admitted three times to an outside hospital for recurrent pneumonia. During those admissions, chest CT scans

revealed nodular densities, tree-in-bud pattern, and patchy areas of ground glass opacities. Multiple bronchoalveolar lavage (BAL) cultures isolated *Klebsiella*, *Staphylococcus*, *Candida*, and *Lichtheimia* (formerly *Absidia*) species. *Lichtheimia* had been treated for six months by an outside facility.

During this admission, a repeat chest CT scan showed ground glass opacities and a right lung consolidation. Bronchoscopy revealed undigested tablets and food particles inside bronchi with purulent secretions bilaterally. A repeat culture of BAL specimens grew *Candida* and *Klebsiella* species. Gram stain of BAL was remarkable for beading, filamentous, branching gram positive rods that failed to stain with acid-fast stain. Pathology consult noted no evidence of *Lichtheimia* species or tissue invasion of organisms, and physical exam and laboratory data showed no symptoms or signs of infection. Thus, no treatment for presumed *Actinomyces* was initiated at the time due to lack of tissue invasion, and treatment for aspiration was initiated.

This case illustrates a delayed recognition of occult aspiration with subsequent recurrent pneumonia. The discovery of undigested tablets in the patient's bronchi and the lack of pulmonary tissue invasion by microbes are consistent with aspiration episodes. Overall, this case highlights the importance of including aspiration in the differential for recurrent pneumonia, especially in elderly patients who may suffer from dysphagia.

147

# A UNIQUE PRESENTATION OF IDIOPATHIC PULMONARY HEMOSIDEROSIS

H Khawaja, S Bhoopalan\*, B Wong. University of Nevada School of Medicine, Las Vegas, NV

10.1136/jim-2017-000663.147

**Purpose of study** Idiopathic Pulmonary Hemosiderosis (IPH) is a rare disease within the paediatric population. The purpose of this case report is to discuss a unique case of pulmonary hemosiderosis, and provide physicians with the necessary knowledge to appropriately identify and manage this condition in a timely fashion. Prompt management will to reduce complications and to identify a possible relationship with cardiac arrest.

**Methods used** The patient's medical charts and laboratory studies during the course of her hospital stay were reviewed for accuracy.

**Summary of results** This is the case of a 5 month old male with bronchopulmonary dysplasia (BPD), who was born prematurely after 25 weeks of gestation, following which he had a 4 month NICU stay. He had been eating and growing well since discharge until he was seen at his pulmonologist's office where he went into cardiac arrest. After resuscitation and intubation, he was transferred to our hospital. Vancomycin and ceftriaxone were started for suspected sepsis. Blood was noted to be coming up through the ET tube and a chest x-ray showed bilateral infiltrates that were suspicious for atelectasis. He underwent bronchoscopy the following day. Cytology of the bronchealveolar lavage sample showed hemosiderin-laden macrophages. He was diagnosed with idiopathic pulmonary hemosiderosis and started on prednisolone. The patient improved within the week and was extubated. Currently he is doing well after discharge and continues to be on prednisolone.

**Conclusions** A high suspicion should be kept for IPH especially with children under the age of ten and/or who have a history of BPD and prematurity. It is still unclear to what the pathogenesis of IPH is, but recent case reports are showing that there might be an association between BPD and IPH. Patients typically present with the classic triad of hemoptysis, anaemia and non-specific opacities on chest imaging. As mentioned, the pathogenesis is unclear but immunological abnormalities, abnormal iron metabolism, or even environmental factors (second hand smoke) have been reported to play a role. Oral glucocorticoids are the mainstay of treatment for these patients and have been observed to reduce morbidity and mortality.

## Surgery II – ophthalmology, orthopaedics, otolaryngology, neurosurgery

### Concurrent session

3:15 PM

Thursday, January 25, 2018

#### 148 INHIBITION OF POSTERIOR CAPSULAR OPACIFICATION IN A CATARACT SURGERY MOUSE MODEL

ML Hupy\*, M Petrash, MG Pedler. *University of Colorado Anschutz Medical Campus, Aurora, CO*

10.1136/jim-2017-000663.148

**Purpose of study** Around two million cataract surgeries are performed each year, with posterior capsular opacification (PCO) being the most common complication reported in 15%–20% of cases. This complication is a result of fibrosis pathways in which residual cells undergo epithelial-to-mesenchymal transitions (EMT), yielding cells with a myofibroblastic morphology. These cells ultimately wrinkle the capsular bag, requiring laser surgeries to clear the visual axis. Recent research has discovered that aldose reductase and TGF- $\beta$ 2/SMAD pathways are important for EMT. Aldose reductase (AR) overexpression results in increased EMT, while TGF- $\beta$  has been shown to induce cellular plaques and opacities in cultured lenses and Smad7 is known to suppress TGF $\beta$ -induced SMAD signalling in EMT. In this study, we investigated the efficacy of Smad7 in inhibiting capsular EMT in a post-cataract surgery model involving mice with a mutation leading to over-expression of the AR gene.

**Methods used** Mice with increased expression of human AR in lens cells were used for an extracapsular lens extraction (ECLE) with intraocular injection of either Smad7, a TGF- $\beta$ 2/SMAD pathway inhibitor protein, or PBS. Five days after ECLE the mice were euthanized and all lens capsules were extracted for histology or QRT-PCR where EMT marker expression such as  $\alpha$ SMA was assessed.

**Summary of results** Elevated expression of AR in mutant mice is associated with higher levels of EMT markers compared to wild type control mice following ECLE. Intraocular injections of Smad7 during ECLE decreased expression of  $\alpha$ SMA detected by qPCR, suggesting that down-regulation of SMAD signalling pathway suppresses EMT in the post-surgical lens

capsule. Currently, our experiments are checking other EMT markers with qPCR and histology.

**Conclusions** AR and TGF- $\beta$ 2/SMAD pathways have been shown to be important for the induction of EMT, ultimately resulting in PCO, the most common complication of cataract surgery. Smad7 injections in mice with AR overexpression reduced the induction of EMT, measured by  $\alpha$ SMA, post ECLE surgery. Future work will look towards a drug carrier that provides extended release in order to improve the delivery of the Smad7 protein to the target site. Such a strategy would help with delivery of drug over time, instead of just the initial effects of injection during ECLE.

#### 149 EVALUATION OF KARTOGENIN, A CHONDROGENIC SMALL MOLECULE, IN CARTILAGE REGENERATION FOR GROWTH PLATE INJURIES

MK Yamamura\*, C Erickson, N Shaw, K Payne. *University of Colorado, Denver, CO*

10.1136/jim-2017-000663.149

**Purpose of study** A significant proportion of paediatric fractures involves the physis (cartilaginous growth plate). Damaged cartilage within the physis is often replaced by unwanted bony repair tissue, forming a 'bony bar'. This can cause joint deformities or halt longitudinal bone growth. Current treatments are limited to largely unsuccessful surgical interventions. Thus, there is a need for therapy to prevent bony bar formation and regenerate healthy cartilage. This study investigated whether kartogenin (KGN), a chondrogenic and chondroprotective small molecule, can reduce bony bar formation and promote cartilage formation in a rat model of growth plate injury.

**Methods used** All animal studies were approved by the University of Colorado IACUC. A drill hole injury in the proximal tibial growth plate of 6 week old Sprague-Dawley rats was created. Injury sites received either no treatment, fibrin glue, fibrin glue +KGN, or fibrin glue +KGN + rat bone marrow mesenchymal stem cells (MSCs). There were 8 limbs per experimental group. 28 days post-treatment micro CT was performed, rats were sacrificed, and their tibias were harvested for histological analysis. Using Bone J software, we measured tibial length and bone to total tissue ratio at the growth plate. Samples were processed with either Alcian Blue Hematoxylin staining or immunostaining for collagen II and examined by light microscopy.

**Summary of results** All groups developed bony bars, with no statistically significant differences between the groups in either micro CT analysis or Alcian Blue Hematoxylin staining. However, a subset of limbs that received KGN and MSCs led to increased fibrogenic and chondrogenic-like tissue expressing collagen II.

**Conclusions** These data suggest that KGN may have a positive effect on cartilage regeneration in rat tibial physal injuries if delivered in conjunction with rat MSCs. Limitations of the study include a lack of fibrin glue +MSC cohort and that KGN release was not optimised. Next steps include a release study to optimise fibrin glue concentration for sustained KGN release and a repeat experiment with the aforementioned cohort. Additionally, we plan to pair KGN with known chondrogenic growth factors (ex. TGF $\beta$ ) to investigate their synergistic potential.



150

# MECHANISMS OF CELL TRANSLOCATION DURING APPENDAGE REGENERATION

LK Moss\*, BS Sugarman, CJ Watson, CH Allan, RY Kwon. *University of Washington, Seattle, WA*

10.1136/jim-2017-000663.150

**Purpose of study** Some species are capable of regenerating limbs by forming a mass of partially dedifferentiated cells called the blastema. How largely non-motile, differentiated cells can translocate to the blastema at the distal tip of the regenerating tissue remains unanswered. In this study, we used dye labelling and cell transplantation techniques in the regenerating zebrafish fin to investigate this translocation.

**Methods used** Injections were performed 2–4 days post fin amputation. For dye injections, 1 nL of micro-Ruby dye was injected into the regenerating fin. For cell injections, cells were harvested from zebrafish embryos (pre-injected with 1 nL of micro-Ruby dye) and transplanted adjacent to the amputation stump; non-viable cell transplants were prepared by exposing donor embryos to high-concentration pronase solution for 1+hours. Cell locations were followed via *in vivo* imaging.

**Summary of results** To test for non-active translocation, we injected dye proximal (n=4), adjacent (n=6), or distal (n=3) to the amputation stump. Dye injected adjacent or distally showed distal translocation, while dye injected proximally segregated into a relatively static signal and one that reached the blastema. To test for translocation of transplanted cells, we injected viable (n=4, figure 1) and non-viable (modelling a non-migratory cell population) cells (n=6) adjacent to the amputation stump. Both groups exhibited distal translocation with kinetics similar to those observed in dye injection experiments.

**Conclusions** We provide evidence of long-range distal translocation of both extracellular molecules and cells to the blastema. The movement of both dye and non-viable cells indicates that a tissue-level transport mechanism is involved, while inconsistent patterns of distalization argue against modes of collective migration. Better understanding methods of cell translocation is vital for the application of epimorphic regeneration in a clinical setting.

151

# SURVIVORSHIP ANALYSIS OF TOTAL KNEE ARTHROPLASTY: EFFECT OF ANATOMIC VS MECHANICAL ALIGNMENT

J Vaughn\*, D Scott. *University of Washington, Rochester, WA*

10.1136/jim-2017-000663.151

**Purpose of study** Longevity of implant survival following total knee arthroplasty (TKA) depends on a variety of factors, with implant alignment being a major element. It is a long-held belief that a neutral mechanical knee alignment will maximise implant survival. However, 32% of men and 17% of women have constitutionally varus knees prior to surgery and may have discomfort with or without implant failure when placed in a neutral alignment. This thought has led to increasing interest in a more anatomic approach to knee implantation. This retrospective study examined long-term survivorship of total knee implants in relation to their pre- and post-operative alignments.

**Methods used** Chart reviews were conducted on patients who previously underwent a total knee arthroplasty between 1999 and 2013. Pre- and post-operative long-standing anteroposterior radiographs were reviewed and the following measurements were made on each radiograph:

1. Long-axis mechanical alignment;
2. Long-axis anatomic tibiofemoral alignment. Charts were then reviewed to determine longevity of the implant – failure was defined as the need for revision due to any mechanical issue.

**Summary of results** There were 300 knees included in this study. Out of the 32 implants that were identified as failure, 14 were excluded because the need for revision was not mechanical in nature. A statistically significant difference was found between the post-operative mechanical alignment and survivorship ( $p=0.025$ ), which favours a more neutral alignment. The post-operative anatomic tibiofemoral alignment and survivorship was also significant ( $p=0.011$ ), favouring a more natural valgus alignment.

**Conclusions** Total knee implant survivorship is improved with a natural mechanical knee alignment for the mechanical angle and anatomic tibiofemoral angle.

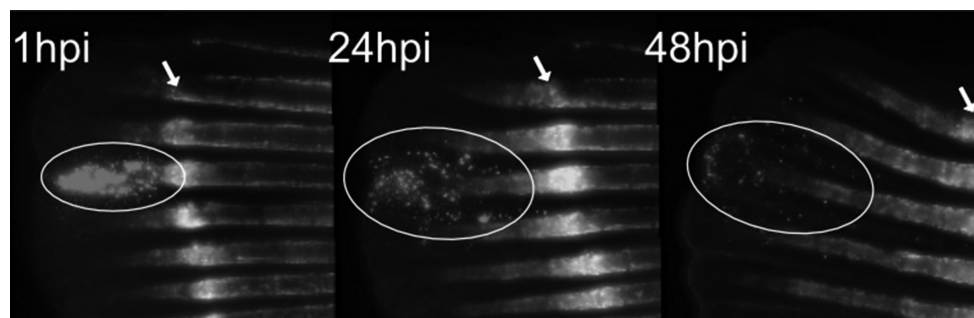
152

# EFFICIACY OF PRE-OPERATIVE GLUE EMBOLIZATION IN THE TREATMENT OF HEAD AND NECK VENOUS MALFORMATIONS

<sup>1,2</sup>H Theeuwes\*, <sup>1,2</sup>R Bly, <sup>1,2</sup>GM Shivaram, <sup>1,2</sup>E Monroe, <sup>1,2</sup>B Ghodke, <sup>1,2</sup>S Vaidya, <sup>1,2</sup>J Perkins. <sup>1</sup>University of Washington School of Medicine, Seattle, WA; <sup>2</sup>Seattle Children's Hospital, Seattle, WA

10.1136/jim-2017-000663.152

**Purpose of study** Cells causing head and neck venous malformations (HNVMs) are difficult to eradicate. Single-stage, pre-operative percutaneous embolization with *n*-butyl cyanoacrylate (*n*-BCA) glue followed by surgical excision ('GES procedure'), allows for predictable HNVM removal while preserving normal tissue and function. In this study, we aimed to describe



**Abstract 150 Figure 1** Image depicts distal translocation of cells (circled) relative to the amputation stump (arrow)



advantages and contraindications of GES in HNVM treatment. We hypothesised that GES treatment outcomes improved compared to other treatment modalities.

**Methods used** Retrospective review of HNVMs evaluated between 2000 and 2016 in a multidisciplinary vascular anomalies centre. Of the 151 HNVM patients identified, 14 were excluded due to diffuse nature of lesions. Data collected: subjective intraoperative blood loss, characteristics of HNVMs not amenable to GES, and the following post-treatment complications: symptom persistence, lesion persistence, facial nerve utility, and skin ulceration. Data was characterised using descriptive statistics and chi-square analysis.

**Summary of results** Patients' age ranged from 0–49 (median 8.1 years). Seventy-nine of 137 (57%) were female. Sixty-three of 137 (46%) lesions were in the mouth; the rest in other facial regions. Sixty of 137 (44%) patients were observed without intervention; 24 (18%) underwent GES; 37 (27%) underwent excision, including 10 patients who were evaluated for and advised against GES due to high-flow or superficial lesions; 14 (10%) underwent laser or sclerotherapy; 2 (1%) were given other treatments (propranolol or pulse dye laser). Among all interventions, there was a marked drop in post-treatment complications from 62% (23/37) pre-2010, to 20% (8/40) after 2010, when GES became a contending treatment. Particularly, GES comprised 15 of 16 oral-lesion interventions post-2010, with 20% complication rate (3/15), vs 78% (18/23) complication rate pre-2010 with other treatment methods ( $p=0.001$ ). Overall complication rates with GES (13%) were decidedly reduced compared to Excision (46%) and Laser/Sclerotherapy (93%).

**Conclusions** Localised HNVMs treated with GES have fewer complications compared to other treatments. Our data suggests that this technique is safe, efficacious, and allows for single stage direct HNVM excision.

153

#### OPTIMISATION OF 3D PRINT MATERIAL FOR THE RECREATION OF PATIENT-SPECIFIC TEMPORAL BONE MODELS

<sup>1</sup>A Quinn\*, <sup>1</sup>MR Haffner, <sup>2</sup>T Hsieh, <sup>2</sup>T Steele, <sup>2</sup>E Strong. <sup>1</sup>University of California, Davis School of Medicine, Sacramento, CA; <sup>2</sup>University of California, Davis Medical Centre, Sacramento, CA

10.1136/jim-2017-000663.153

**Purpose of study** To identify the 3D printed material that most accurately recreates the visual, tactile, and kinesthetic properties of human temporal bone.

**Methods used** This is a prospective qualitative assessment performed at a tertiary care academic institution. 13 otolaryngology residents and 2 otolaryngology attendings with an average of 3.6 years of post-graduate training and 56.5 temporal bone (TB) procedures participated in the study. Each participant performed a partial mastoidectomy on human cadaveric bone then five 3D printed TBs each of a different material. After drilling each unique material, the participant filled out a survey to assess each model's appearance and physical likeness on a Likert scale from 0 to 10 (0 being least representative and 10 being the most representative). The 3D models were acquired by CT imaging and segmented using 3D Slicer software.

**Summary of results** Polyethylene terephthalate (PETG) had the highest average Likert survey response for feel and appearance, scoring 8.3 (SD=1.7) and 7.6 (SD=1.5), respectively.

The remaining plastics scored as follows for feel and appearance, respectively: polylactic acid (PLA) averaged 7.4 and 7.6, acrylonitrile butadiene styrene (ABS) averaged 7.1 and 7.2, polycarbonate (PC) averaged 7.4 and 3.9, and nylon averaged 5.6 and 6.7.

**Conclusions** PETG 3D printed temporal bone models offer the most realistic appearance and haptic feedback as compared with PLA, ABS, PC and nylon. PLA and ABS were reliable alternatives that also performed well with both measures.

**Abstract 153 Table 1** Survey results from study participants

Material	Feel average score (Std. dev)	Range	Appearance average score (Std. dev.)	Range
ABS	7.1 (1.7)	4–10	7.2 (1.6)	4–10
Nylon	5.6 (1.2)	3–7	6.7 (1.5)	4–9
PC	7.4 (2.6)	1–10	3.9 (2.0)	0–6
PETG	8.3 (1.7)	3–10	7.6 (1.5)	3–10
PLA	7.4 (2.1)	3–10	7.6 (1.5)	4–10

154

#### ELEVATED SPINAL CORD TISSUE MOTION AT THE FORAMEN MAGNUM IS AN INDICATOR OF SYMPTOMATIC CHIARI MALFORMATION

<sup>1,2,3</sup>BJ Lawrence\*, <sup>2</sup>RG Ellenbogen, <sup>4</sup>M Luciano, <sup>3</sup>BA Martin. <sup>1</sup>University of Washington, Boise, ID; <sup>2</sup>University of Washington, Seattle, WA; <sup>3</sup>University of Idaho, Moscow, ID; <sup>4</sup>Johns Hopkins University, Baltimore, MD

10.1136/jim-2017-000663.154

**Purpose of study** Type 1 Chiari malformation (CM-I) is a craniospinal disorder that affects ~1 out of 1000 individuals in the U.S. and is often defined by cerebellar tonsillar position greater than 3–5 mm below the foramen magnum. This definition has come under question since quantitative measurements of tonsillar position do not always correspond with symptom severity. Researchers have proposed additional radiographic diagnostic criteria based on dynamic motion of fluids and tissues. The study objective was to determine if cardiac-related craniocaudal spinal cord tissue displacement is an indicator of symptomatic CM-I and if tissue displacement is altered due to decompression surgery.

**Methods used** Axial phase-contrast MRI measurements were obtained at the foramen magnum level for 20 symptomatic pre- and post-surgery CM-I patients and 15 healthy volunteers. Images were collected with thru-plane velocity encoding and retrospective reconstruction over the cardiac cycle. Spinal cord motion at the foramen magnum was obtained based on a manually selected region of interest and quantified based on the peak-to-peak value of the integral of the average SC velocity. Linear mixed-effects model analysis with a parametric bootstrap method and post-hoc Tukey was used to test subject groups.

**Summary of results** Spinal cord motion at the foramen magnum for the pre-surgery group was significantly greater than controls ( $p=0.0009$ ) after Tukey's adjustment for multiple comparisons. Motion decreased following surgery ( $p=0.058$ ) with an effect size of  $-0.151$  mm and a standard error of  $0.066$  mm. Post-operatively, no statistical difference from controls in bulk displacement at the foramen magnum was found ( $p=0.200$ ) after adjusting for multiple comparisons.

**Conclusions** These results support SCM measurement by phase-contrast MRI as a possible non-invasive radiographic diagnostic for CM-I. Dynamic measurement of spinal cord motion provides unique diagnostic information about CM-I alongside static quantification of tonsillar position and other intracranial morphometrics.

# 155 A COMPARATIVE ANALYSIS OF RADIOGRAPHIC PARAMETERS IN LUMBAR FUSION TECHNIQUES

S Ahlquist\*, DY Park. David Geffen School of Medicine at UCLA, Los Angeles, CA

10.1136/jim-2017-000663.155

**Purpose of study** Lumbar disc pathology is common in the ageing population, causing significant pain and disability. Lumbar fusion is a popular and effective surgical option to provide stability and restore anatomy. While current literature has demonstrated the effectiveness of various fusion techniques, there is little data comparing their ability to improve sagittal balance. This study directly compares the impact of anterior (ALIF), direct lateral (DLIF), transforaminal (TLIF), and posterolateral (PLF) approaches on pelvic radiographic parameters. **Methods used** Measurements were performed on pre and post-operative radiographs of all single-level lumbar fusion cases at a single institution from 2013–2016. Independent sample t-test, McNemar test, and one-way ANOVA were used to establish significant differences in segmental lordosis (SL), lumbar lordosis (LL), and pelvic incidence-lumbar lordosis mismatch (PI-LL). Multiple linear regression was performed to derive a predictive model for SL.

**Summary of results** There were 164 patients (78 M, 86 F) with a mean age of 60.1 years and radiographic follow up time of 9.3 months. ALIF and DLIF significantly improved SL (7.9° and 4.4°, respectively;  $p<0.001$ ), LL (5.3° and 7.7°, respectively;  $p<0.001$ ), and PI-LL (−2.8°,  $p=0.05$  and −6.9°,  $p<0.001$ , respectively). TLIF significantly improved SL (1.7°,  $p=0.02$ ) and LL (2.7°,  $p=0.006$ ) to a lesser extent, but did not improve PI-LL ( $p=0.16$ ). PLF did not significantly alter any of the parameters. ALIF was the only technique that significantly increased the proportion of patients with a PI-LL  $\leq 10^\circ$  (0.46 to 0.71,  $p=0.02$ ). Lordotic cages had superior improvement of SL (5.0°,  $p<0.001$ ), LL (4.6°,  $p<0.001$ ), and PI-LL (−3.3°,  $p=0.04$ ) than non-lordotic cages. Implant lordosis ( $m=1.1$ ), fusion technique ( $m=6.8$ ), and surgical level ( $m=6.9$ ) significantly predicted post-operative SL ( $p<0.001$ ,  $R^2=0.56$ ).

**Conclusions** This study demonstrated that the four predominant lumbar fusion techniques yield divergent radiographic results. ALIF and DLIF produced superior improvements in radiographic measurements than TLIF and PLF. TLIF did not significantly improve PI-LL, a vital sagittal balance parameter. Implant selection was shown to be an important determinant of post-operative alignment and surgeons should be cognizant of the impact that differing implants produce at each surgical level.

## Poster session

### Adolescent medicine and general paediatrics

6:00 PM

Thursday, January 25, 2018

# 156 HEMATURIA IN A 2-YEAR OLD FEMALE

H Khawaja\*, S Bhoopalan, R Garg. University of Nevada Las Vegas, Las Vegas, NV

10.1136/jim-2017-000663.156

**Purpose of study** Glomerulonephritis is a common renal disorder in paediatrics. The purpose of this case report is to discuss a unique case of post-infectious glomerulonephritis and provide physicians with the necessary knowledge to appropriately manage this condition to reduce complications associated with post-infectious glomerulonephritis.

**Methods used** The patient's medical charts and laboratory studies during the course of her hospital stay were reviewed for accuracy.

**Summary of results** A 2-year-old previously healthy female child was admitted for hematuria. She has been having fever for the last 4 days with a recorded maximum temperature of 104 F. The parents report that she has been having multiple episodes of non-bloody non-bilious vomiting and bright red blood in urine for the last 2 days. She is on cefdinir which was started by her paediatrician two days prior to admission for a presumed urinary tract infection. Past medical and social histories were insignificant.

On admission, she had a rectal temperature of 100.2 F and a heart rate of 126 beats per minute. Physical examination showed a non-toxic, dehydrated child and insignificant abdominal examination. She was noted to have a 2 cm by 4 cm impetiginous rash on her chin. Her CBC was within normal range. Urinalysis showed concentrated urine with 3 +protein and 20 WBCs and >200 RBCs per high power field. Nitrite test was negative. Further work up revealed patient had elevated anti-streptolysin O (ASO) titers, low C3 protein and normal C4 protein levels suggesting post-streptococcal glomerulonephritis. Cefdinir was discontinued which we believe was responsible for the red-coloured stools.

**Conclusions** A thorough history and physical examination are vital to identify the aetiology of glomerulonephritis. While glomerulonephritis can be asymptomatic, the classic presenting complaints are oedema and hematuria. After IgA nephropathy, the most common cause of glomerulonephritis is post-streptococcal glomerulonephritis (PSGN). This association between streptococcal infection and glomerulonephritis was noted more than 200 years ago in patients who had bloody urine following Scarlet fever. In addition to Group A Streptococci (GAS), there are many organisms and viruses that can also result in a similar clinical picture. Although this case report is a classic presentation of PSGN we believe it would be educational value to residents and physicians.

157

**PARENTAL MEAL PLANNING HABITS AND CHILDREN'S BMI**E Pak\*, CM Abreu, AJ Smith, E Williams, E Medina, NM Malika, M Baum. *Loma Linda University, Loma Linda, CA*

10.1136/jim-2017-000663.157

**Purpose of study** According to the Community Indicators Report by San Bernardino County, in 2015 an average of 40.5% of San Bernardino County students was overweight or obese, which was an increase from 39.4% from the prior year. Some factors that may influence children's weight are the parent's own meal planning habits. The aim of this study is to assess possible associations between parental meal planning habits and their children's BMI.

**Methods used** Operation FIT is a week-long summer day camp that hosts children aged 9–15 years of age from San Bernardino County, referred by doctors for their unhealthy weight (BMI >85%). They are encouraged to exercise throughout the day and educated on basic nutrition to empower them with the tools needed to live healthy lives. Parents were given surveys which included three questions regarding their meal planning habits: taking time to plan meals for the week, taking a shopping list to the store, or knowing what to eat for supper. These answers were then compared to their children's BMI using logistic regression models.

**Summary of results** A Logistic regression with a sample size of  $n=274$  was conducted to assess if parental planning habits predict children BMI. The data shows that parents that know what they or the family will eat for supper are 1.74 units more likely to have obese children. There was no association between taking time to plan meals for the week and parents taking a shopping list to the store. In addition, when all variables are held constant, a significant association was found among those children that speak Spanish only and are Hispanic with being overweight/obese.

**Conclusions** We believe that this survey was flawed in that the survey question that was found to be significant is confusing because it requires a 'no' response for an affirmative answer. Because of this, as well as there being no correlation in the other two questions, it is plausible that parental meal planning has no effect on children's BMI. This is a potential area of concern that can be further explored with future studies with improved survey questioning.

function also provide important contributions to the signs and symptoms experienced by patients with heart disease. Patients with left ventricular diastolic dysfunction have an increased risk of postoperative major adverse cardiac events (MACEs) as the grade of diastolic dysfunction increases. Echocardiographic variables recommended for assessment of LV diastolic function grade include mitral flow velocities, mitral annular  $e'$  velocity,  $E/e'$  ratio, peak velocity of TR jet, and LA maximum volume index. The varying degrees of diastolic dysfunction range from grade 1 signifying impaired relaxation to grade 3, restrictive. Identifying high-risk patients in the preoperative setting, while implementing monitoring of diastolic function intraoperatively could perhaps reduce perioperative morbidity.

**Methods used** Our research aims to characterise the reproducibility of the measurement left ventricular diastolic dysfunction by surveying the effects of a 500 mL IV-fluid bolus. This study is a sub-study of an ongoing protocol designed to evaluate a new dynamic monitor of cardiac function. A midesophageal, 4-chamber TEE view was used to measure transmitral blood flow and tissue Doppler velocities. After baseline measurements were recorded, the IV-fluid bolus was administered over 10 min. After an additional 5 min post-infusion values were measured.

**Summary of results** In 29 patients a paired t-test was used to compare  $E/A$ , and  $E/e'$  values. (See table 1).

**Conclusions** Although there is not a consistent statistically significant response to the fluid bolus, the sample size is small and the data are fragile, indicating additional samples are necessary to fully characterise the study population. Although our findings are consistent with previous findings that mitral annular velocity as determined by tissue Doppler imaging are relatively pre-load independent when evaluating diastolic function, the trends suggest further study is merited.

**Results**

**Abstract 158 Table 1** Mitral inflow velocity ratios ( $E/A$ ), and tissue Doppler velocities ( $E/e'$ ) before and after a fluid bolus

$E/A$	Pre: $1.13 \pm 0.32$	Post: $1.36 \pm 0.59$	$P=0.019$
$E/e'$	Pre: $9.30 \pm 3.63$	Post: $9.88 \pm 3.71$	$P=0.227$

159

**DOES COMMUTING TIME TO THE TRANSPLANT CENTRE REFLECT COMPLIANCE WITH VISITS AND OUTCOME AFTER HEART TRANSPLANT IN A BIG METROPOLITAN AREA?**A Patel\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. *Cedars-Sinai Medical Centre, Los Angeles, CA*

10.1136/jim-2017-000663.159

**Purpose of study** Compliance after heart transplantation (HTx) is important to ensure adequate drug dosing and avoidance of complications especially within the first six-months. To ensure care access and compliance, we have required all HTx patients (pts) within 2 months of surgery reside within 120 min commuting time (CT) from our hospital. Rejection episodes correlate to non-compliance with visits and medication. In a large metropolitan area, CT to the transplant centre is highly dependent upon traffic. We broached this issue by assessing Google Maps to assess CT during clinic hours. We assessed whether increased CT led to missed clinic visits or missed procedures such as protocol biopsies (bx). To our knowledge,

## Poster session

## Cardiovascular

6:00 PM

Thursday, January 25, 2018

158

**THE EFFECTS OF AN IV-FLUID BOLUS ON THE ASSESSMENT OF DIASTOLIC FUNCTION**S Ayala\*, D Li, O Badakhsh, N Fleming. *University of California (Davis), Sacramento, CA*

10.1136/jim-2017-000663.158

**Purpose of study** Historically, characterising cardiac function has been limited to systole. However, abnormalities of diastolic

Abstract 159 Table 1

Endpoints	CT<30 min (n=76)	CT 30–60 min (n=150)	CT 60–90 min (n=155)	CT 90–120 min (n=142)	CT>120 min (n=132)	P-value
% Non-Compliance*	46.0% (35/76)	38.0% (57/150)	37.4% (58/155)	26.1% (37/142)	26.5% (35/132)	0.007
1 Year Survival	86.8%	93.3%	89.6%	92.3%	94.7%	0.270
1 Year Freedom from Any-Treated Rejection	85.3%	84.7%	84.5%	88.7%	86.4%	0.857
1 Year Freedom from Acute Cellular Rejection	94.7%	91.3%	94.2%	95.0%	93.9%	0.800
1 Year Freedom from Antibody-Mediated Rejection	94.7%	95.3%	97.4%	96.5%	96.2%	0.851
1 Year Freedom from Infection	51.3%	52.0%	46.5%	61.3%	50.0%	0.169

\*120 min, p=0.006.

this use of Google Maps has not been used in assessing CT in transplantation.

**Methods used** Between 2008–2016 we assessed 655 HTx pts and analysed their CT to our clinic. Pts were divided by CT <30 min (n=76), 30–60 min (n=150), 60–90 min (n=155), 90–120 min (n=142), and >120 min (n=132) from the clinic. These CT were correlated to compliance with scheduled visits, bx, and regular blood draws. In addition, CT were correlated to the development of first-year rejection, infection and survival after HTx. CT were seen individually and as an aggregate in the first 6 months after HTx.

**Summary of results** CT >90 min were noted to have significantly less missed appointments and non-compliance. Pts with the shortest commuting times had significantly higher rates of non-compliance (table 1). However, survival and rejection rates were similar between all groups. There was no significant difference in freedom from infection between all groups.

**Conclusions** Policies to have recent HTx pts reside within 90–120 min CT to our transplant clinic may not be necessary. Longer CT to the transplant centre appears to result in greater compliance with visits.

160

## DOES OCCUPATION AFFECT OUTCOME FOLLOWING HEART TRANSPLANTATION?

A Sanford\*, S Dimbil, R Levine, M Hamilton, J Kobashigawa. *Cedars-Sinai Medical Centre, Los Angeles, CA*

10.1136/jim-2017-000663.160

**Purpose of study** Among many social factors affecting outcome after heart transplantation (HTx), occupation(OPN) may be important for compliance as it may impact infection, rejection and survival.

**Methods used** Between 2007–2012 we assessed 283 HTx outcomes according to OPN. These included manual labour (blue-collar) (n=117), white-collar(n=154), and military(n=12), with subcategories teachers(n=11), physicians (n=24) and business owners (n=13). We assessed 1 year freedom from rejection and infection, 5 year survival, 5 year freedom from cardiac allograft vasculopathy (CAV) (angiographic stenosis  $\geq 30\%$ ), and 5 year freedom from non-fatal major adverse cardiac events (NF-MACE) (table 1). Compliance was assessed (cancelled or no-show appointments, lost to follow-up).

Abstract 160 Table 1

Endpoints	Blue-Collar Workers (n=117)	White-Collar Workers (n=154)	Military Personnel (n=12)	P-value
% Non-Compliance	24.8%	26.0%	8.3%	0.899
1 Year Freedom from Any-Treated Rejection	87.1%	86.4%	91.7%	0.874
1 Year Freedom from Acute Cellular Rejection	92.3%	93.5%	100.0%	0.575
1 Year Freedom from Antibody-Mediated Rejection	98.3%	96.1%	100.0%	0.462
1 Year Freedom from Infection	53.8%	55.0%	75.0%	0.405
5 Year Survival	75.2%	79.9%	91.7%	0.305
5 Year Freedom from CAV	81.2%	81.8%	83.3%	0.883
5 Year Freedom from NF-MACE (myocardial infarction, new heart failure, coronary intervention, implantable defibrillator/pacemaker implant, stroke)	81.7%	86.4%	75.0%	0.380
Endpoints	Teachers (n=11)	Physicians (n=24)	Business owners (n=13)	P-value
% Non-Compliance	36.4%	16.7%	46.2%	0.116
1 Year Freedom from Any-Treated Rejection	90.9%	87.5%	100.0%	0.361
1 Year Freedom from Acute Cellular Rejection	100.0%	91.7%	100.0%	0.533
1 Year Freedom from Antibody-Mediated Rejection	100.0%	100.0%	100.0%	1.000
1 Year Freedom from Infection	60.0%	52.2%	46.2%	0.860
5 Year Survival	72.7%	83.3%	92.3%	0.706
5 Year Freedom from CAV	72.7%	79.2%	84.6%	0.464
5 Year Freedom from NF-MACE*	72.7%	100.0%	69.2%	0.023

\*Business Owners vs Physicians, p=0.003, Teachers vs Physicians, p=0.007



**Summary of results** There was no significant difference in 1 year rejection, 5 year survival or freedom from CAV among all groups. Numerically, military personnel did better in all outcomes except 5 year freedom from NF-MACE. Teachers and business owners had a significantly reduced 5 year freedom from NF-MACE vs physicians ( $p=0.023$ ). There was no difference in compliance between professions.

**Conclusions** OPN appears not to affect most outcomes or compliance following HTx. Military personnel may have better outcome. Further investigation into teachers and business owners having less freedom from NF-MACE is warranted but other variables may be important.

## Poster session

## Case reports

6:00 PM

Thursday, January 25, 2018

161

### HOW A BRONCHOSCOPY PREVENTED LOBECTOMY: A PAEDIATRIC CASE OF PULMONARY *ACTINOMYCES ODONTOLYTICUS*

AN Gray\*, Do PC. UCSF Fresno, Santa Maria, CA

10.1136/jim-2017-000663.161

**Case report** *Actinomyces odontolyticus* is an insidious, Gram positive, anaerobic bacilli is a typical flora of the buccal mucosa and is known to cause chronic cervicofacial infections. *A. odontolyticus* rarely causes disease in adults and especially immunocompetent children. Thoracic disease caused by *A. odontolyticus* is thought to be due to aspiration of oropharyngeal secretions leading to either pneumonia or abscess. Histology is the only definitive means to make a diagnosis thus making surgery often the only option available.

An 11-year-old female with recurrent otitis media and pneumonia presented to pulmonology for chronic cough for two years. She was previously treated with albuterol, nasal decongestants, steroids, and four courses of antibiotics for a left lung infiltrate. She had no history of periodontal disease. Exposure history was significant for Coccidioidomycosis pneumonia in her grandmother. Physical exam was remarkable for a non-productive cough and grade two bilateral palatine tonsillar hypertrophy. She was initially treated with amoxicillin/clavulanic acid for presumed protracted bacterial pneumonia. Labs including a sweat chloride test, tuberculosis screen, and immunoglobulin levels were all within normal limits. Chest computed tomography one month later showed left lower lobe bronchiectasis. A bronchoscopy revealed a left lower lobe mucoid mass with bronchoalveolar lavage which grew *A. odontolyticus*. She was started on penicillin G and referred to cardiothoracic surgery who recommended a left lobectomy. Six months later, a repeat bronchoscopy showed a large amber-coloured crystallised tissue in the left lower lobe which was removed and identified as *A. odontolyticus*. She will be referred to otolaryngology for palatine tonsil removal as the potential infection source.

This is the only known reported case of *Actinomyces odontolyticus* causing thoracic disease in an immunocompetent

child. Due to delay in diagnosis and disease chronicity, surgery may become the only treatment option available. Direct bronchoscopic visualisation was able to prevent significant morbidity of a lobectomy in this child and improve her quality of life.

162

### IXAZOMIB FOR PRIMARY CUTANEOUS PLASMACYTOMA

J Huynh\*, M Arora. UC Davis Medical Centre, Sacramento, CA

10.1136/jim-2017-000663.162

**Case report** A 43-year-old man presented with small red raised lesions localised to his right abdomen. Over the next five years, the lesions spread to his back, bilateral arms and neck. Neither ketoconazole (for presumed tinea) nor topical steroids improved the lesions. Biopsy of a lesion showed superficial and deep plasma cell infiltrate with a 2:1 kappa:lambda ratio, consistent with cutaneous plasmacytosis. PET/CT scan showed no FDG-active disease. Bone marrow biopsy showed a mild increase in polyclonal plasma cells (6%), likely reactive. Complete blood count, basic metabolic panel, serum protein electrophoresis, beta-2-microglobulin, kappa:lambda light chain ratio, and serum interleukin-6 were all within normal limits. The patient was diagnosed with primary cutaneous plasmacytoma. He trialled three cycles of bortezomib with improvement and disease control for several months, but this was stopped due to concerns of high cumulative dosing causing toxicity. He then failed topical tacrolimus, psoralen plus UVA (PUVA) with oxasoralen, and intralesional kenalog injections. Lenalidomide was tried but stopped due to an immune-related flare reaction from the agent. A second trial of bortezomib caused a subcutaneous injection-related reaction. He then started ixazomib and completed 12 cycles with an excellent response. His lesions regressed in size, colour and number. Above stated labs and repeat PET/CT continued to show no evidence of systemic disease.

Primary cutaneous plasmacytoma is a rare cutaneous B-cell lymphoma consisting of monoclonal plasma cells in the absence of underlying multiple myeloma. Lesions can be single or multiple red-brown plaques or nodules. Histologically, there is a plasma cell infiltrate with various degrees of maturation and pleomorphism. Neoplastic cells express CD79a, CD38 and CD138 antigens and are negative for CD19, CD20 and common leukocyte antigen. There is no current standard of care treatment. Potential treatments include radiation, surgery, intralesional tumour necrosis factor-alpha injections, PUVA, topical tacrolimus or chemotherapy.

The patient presented here had a remarkable response to ixazomib, an oral proteasome inhibitor. The robust response is especially unique as this agent—usually used in conjunction with other chemotherapeutic agents—was used as a single agent and has not been used for this indication before.

163

### CONVERSION OF MINIMAL CHANGE DISEASE TO FOCAL SEGMENTAL GLOMERULOSCLEROSIS IN A PATIENT WITH HODGKINS LYMPHOMA

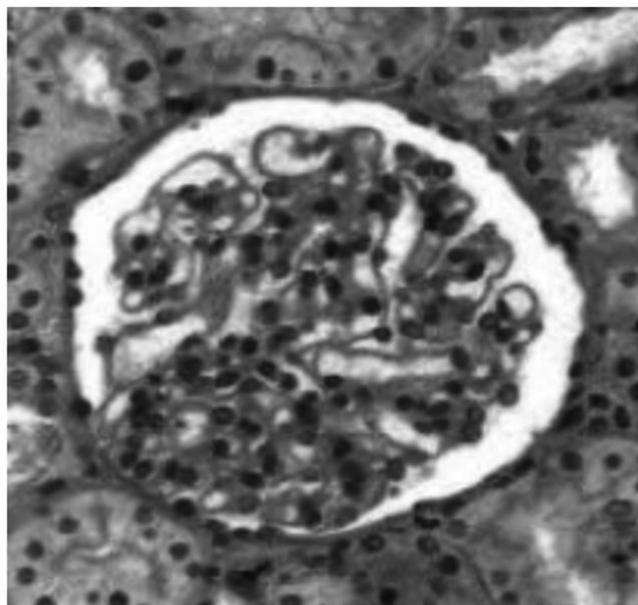
S Imran\*, M Aigbe. University of Nevada, Las Vegas School of Medicine, Las Vegas, NV

10.1136/jim-2017-000663.163

**Case report** The patient is an eleven years old female who initially presented with generalised swelling of the body involving her face, abdomen and extremities. She was diagnosed with nephrotic syndrome given her exam findings of elevated protein to creatinine ratio (3.2), hypoalbuminemia (2.5 g/dL) and hyperlipidemia (cholesterol 262 mg/dL).

Her initial renal biopsy was suggestive of minimal change disease (MCD). Patient continued to have significant proteinuria and generalised oedema and exhibited no response to mycophenolate, cyclosporine, or steroids. Therefore, a second renal biopsy was done which indicated focal segmental glomerulosclerosis (FSGS), (figure 1).

She received three doses of rituximab and had marked reduction of oedema and proteinuria. Eventually she had normalisation of renal function after several months. However, the patient started complaining of chest pain and dyspnea. Computed Tomography (CT) imaging showed diffuse lymphadenopathy. Lymph node biopsy was compatible with a diagnosis of Hodgkin's Lymphoma (HL).



**Abstract 163 Figure 1** Conventional light microscopy showing segmental sclerosis of glomeruli

Our patient had a dramatic response to rituximab, which treated not only her Hodgkin's Lymphoma but also the associated paraneoplastic steroid resistant nephrotic syndrome.

Solid organ tumours and haematological malignancies can present as glomerular disease. HL is well known to be associated with minimal change disease (MCD) often resolving with adequate treatment of the HL. Focal segmental glomerulosclerosis (FSGS) is one of the frequently reported associations with malignancy. There have been anecdotal reports of FSGS associated with mantle cell lymphoma and Hodgkin's lymphoma. To our knowledge there has been no report of MCD transition to FSGS in a patient with Hodgkin's lymphoma.

164

# TRACHEO-ARTERIAL FISTULA (TAF) IN A 16 YEAR OLD FEMALE 3 MONTHS AFTER TRACHEOSTOMY

<sup>1</sup>B Jagadesan\*, <sup>2</sup>S Arciniegas Rodriguez. <sup>1</sup>University of Nevada Las Vegas School of Medicine, Las Vegas, NV; <sup>2</sup>Sunrise Children's Hospital, Las Vegas, NV

10.1136/jim-2017-000663.164

**Purpose of study** The purpose of this is to increase the awareness of this rare condition and its occurrence months after tracheostomy. Fistula between trachea and the innominate artery is a life-threatening complication and typically occurs during the 1 st 3 weeks after tracheostomy.

**Methods used** Chart review and review of literature.

**Summary of results** We present a 16-year-old female who was admitted to PICU with diagnosis of seizures and altered mental status. She had a prolonged course that was complicated by status epilepticus and encephalopathy which was diagnosed as anti-NMDAR encephalitis. She remained encephalopathic throughout her stay. She eventually needed tracheostomy which was done 1 month after her admission. Approximately 5 months after her stay and 3 months after her tracheostomy, she was found to have fresh blood coming out of her tracheostomy upon coughing. Immediately oxygen support was provided. She continued to have coughing spells with more blood coming out of her tracheostomy and subsequently from her nose and mouth. She developed massive haemorrhage from her tracheostomy. A code was called. We inflated the cuff, as instructed by ENT, and continued providing positive pressure ventilation. The patient eventually went into cardiac arrest. During the resuscitation, her rhythm was consistent with asystole. Unfortunately she did not have any signs of life and was pronounced dead. An autopsy results were consistent with TAF. Pathology reports showed tracheo-innominate fistula (TIF) at the end of tracheostomy tube causing massive haemorrhage into the airway with evidence of blood aspiration.

**Conclusions** TAF is a life-threatening condition with a survival of 14%. Mechanism of TIF formation is mucosal necrosis into the wall of the trachea resulting in fistulous communication with the innominate artery due to pressure exerted by the tracheostomy tube, abnormally high innominate artery and low tracheostomy. Diagnosis is dependent upon a high index of suspicion. When suspected immediate action should be taken to stop the bleeding as diagnostic modalities may lead to delay and death. Temporary manoeuvres like over inflating the cuff, pressure on the stoma to compress the sentinel bleeder may be performed while waiting for surgical repair.

165

# PSEUDOMONAS AERUGINOSA JOINT AND GRAFT INFECTION FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION SURGERY

HB Parikh\*, A Armento, AG Gagliardi, TN Mandler, JC Albright. University of Colorado School of Medicine, Aurora, CO

10.1136/jim-2017-000663.165

## Case report

**Introduction** Surgical site infection (SSI) is a rare postoperative complication of anterior cruciate ligament (ACL) reconstruction that can be devastating if not urgently treated. Uncommonly cultured from SSI's is *Pseudomonas aeruginosa*. While many nosocomial etiologies have been reported in the literature, no environmental etiologies have been reported. In this case report, we describe a patient presenting with a post-operative *P. aeruginosa* infection likely secondary to environmental hot tub exposure.

**Case description** A 15-year-old male presented to our clinic with a right ACL tear sustained after a football injury. Eight weeks after surgery, the patient returned with a painful red bump over the tibial incision site. The abscess and joint fluid were aspirated and grew *P. aeruginosa* in culture. Upon further questioning, the patient reported swimming in a recreational hot tub about 2 weeks after initial surgery. Incision and drainage revealed significant synovitis and a grossly infected graft. The graft and associated hardware were subsequently removed. He was initially treated with two days of IV cefepime and transitioned to oral levofloxacin based on culture susceptibilities. After CRP normalisation, he went on to complete a three month course of oral levofloxacin and subsequently make progress in physical therapy.

**Discussion** Given that *P. aeruginosa* is commonly found in moist environments, the patient's history of hot tub use was the most likely aetiology of SSI. To our knowledge, this is the first reported case of *P. aeruginosa* infection following ACL reconstruction attributed to a presumed environmental cause. Even though infection after ACL reconstruction is rare, providers can take measures to prevent this type of infection for future patients. Clinicians should remain cognizant that public pools, hot tubs, and other moist environments pose a *P. aeruginosa* infection risk to surgical incision sites. We suggest that patients be informed of this risk to avoid a potentially serious postoperative complication.

## 166 MOEBIUS SYNDROME WITH EVENTRATION OF DIAPHRAGM: A RARE PRESENTATION

IG Renteria\*. UCSF Fresno, Clovis, CA

10.1136/jim-2017-000663.166

## Case report

**Background** Moebius syndrome is a rare non-progressive neurological congenital disorder that results in impaired cranial nerves. It is estimated that the condition affects 1 in 50 000 to 1 in 5 00 000 newborns. Cranial nerves commonly affected are cranial nerve VI, and VII impairment which result in absence of lateral eye movement and facial paralysis respectively. Other cranial nerves can also be involved. Eventration of the diaphragm results when all or part of the diaphragmatic muscle is replaced by fibroelastic tissue, and is also a rare event. While Moebius syndrome has been associated with aplasia of the pectoralis major muscle, and Poland Syndrome, there are no reported cases in the literature associated with eventration of the diaphragm.

**Case presentation** OG is a ex-39 weeker who was in couplet care with mom when he was noted to have difficulty latching to the nipple and no suck reflex. Other concerning features included a thick, flat jaw, small chin and no protrusion of tongue. There was also the absence of facial expressions and

grimace when crying. Due to a soft murmur on the initial exam and possible association with suspected underlying genetic disorder, an echocardiogram was obtained. The echocardiogram was concerning for a right lung mass compressing the right atrium and right ventricle. A follow up chest x-ray also noted a possible right sided pulmonary mass. A chest CT was obtained showed no evidence of pulmonary or pleural mass. Instead, it was noted that there was anterior medial right hemidiaphragm with upward bulging of the right lobe of the liver resulting in leftward shift of heart consistent with right sided diaphragmatic eventration.

**Conclusion** While Moebius syndrome has been associated with other muscular defects, there is no other case recorded or linked association between Moebius syndrome and eventration of diaphragm.

## 167 SARCOMATOID CARCINOMA OF THE HYPOPHARYNX: CASE REPORT AND REVIEW OF LITERATURE

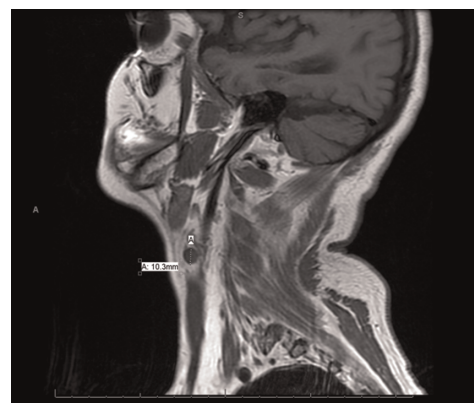
<sup>1</sup>RC Smith\*, <sup>2</sup>A Dominick, <sup>3</sup>D Tang. <sup>1</sup>UCLA, San Francisco, CA; <sup>2</sup>San Diego State University, San Francisco, CA; <sup>3</sup>Kaiser Permanente, San Francisco, CA

10.1136/jim-2017-000663.167

**Case report** A 67 year-old female presented to Otolaryngology clinic with a two month history of worsening throat pain, hoarseness and dysphagia. The patient had a history of alcohol abuse and was a former smoker. She had a history of lung cancer in 2006 status post lobectomy and chemoradiation. Nasopharyngeal endoscopy exam revealed a fungating lesion in the left hypopharynx (images 1a, 1b). A biopsy was performed of the hypopharyngeal mass which revealed features of both carcinoma and sarcoma. Pathology consisted of an immunostain for cytokeratin, staining strongly at surface epithelium but faintly in underlying tumour cells (image 2a). A tertiary academic centre was referred for second opinion, confirming Sarcomatoid Carcinoma. Both MRI (images 3a, 3b) and PET scans (image 4a) were obtained with results clearly locating the tumour left hypopharyngeal.

Chemotherapy (single agent platinol) and radiation (5000 cGy) was recommended to the patient as advised by a head and neck multi-disciplinary tumour board, which the patient agreed to receive. Image 5a shows the patient's hypopharynx post-treatment.

Approximately one year after treatment the cancer recurred and progressed despite continued chemotherapy and radiation. Two new masses were found; one mass identified through



Abstract 167 Figure 1 Sagittal MRI showing neck mass



PET scan and a second located proximal esophageal at oesophagus inlet. She received a total laryngopharyngectomy with a level 2a to 4 neck dissection and an anterolateral thigh free flap reconstruction. Unfortunately, the patient died five months later, after also being diagnosed with Pancreatic Cancer Stage IV, metastatic to Liver. It is possible this patient was more susceptible to cancers from alcohol consumption, smoking or maybe from a hereditary predisposition to cancers.

168

### MYSTERY OF BLACK FINGERS AND TOES: A CASE OF DRY GANGRENE

C Solorio\*. University of California, Davis School of Medicine, Sacramento, CA

10.1136/jim-2017-000663.168

**Introduction** Dry gangrene has many common etiologies including arterial occlusion, diabetes mellitus, atherosclerosis, and long-term smoking. Less frequently, it is caused by autoimmune vasculitis, connective tissue disease, infections, trauma, severe burns, frostbite, and reactions to epinephrine and ergot alkaloids.

**Case** We report a case of a previously healthy middle-aged African American woman and truck driver with a 4 pack-year smoking history. She presented to the emergency department at University of California Davis Medical Centre (UCDMC) for chest pain secondary to pulmonary embolism. Before presenting to UCDMC, she was diagnosed with thromboangiitis obliterans (Buerger's disease) from an outside hospital after presenting with bilateral hand and foot numbness, tingling, and pain. She then noticed finger and toe discoloration. An extensive work-up showed multiple clots in both upper and lower extremities, microvascular ischemia of all toes and fingers bilaterally, elevated C-reactive protein, mild leukocytosis, thrombocytopenia, and an acute kidney injury. She was diagnosed with Buerger's disease given smoking history and negative work-up for rheumatologic, paraneoplastic, infectious, malignancy, and hypercoagulable causes of limb ischemia. She underwent evaluation by vascular surgery, dermatology, rheumatology, orthopaedic surgery, haematology oncology, and toxicology at UCDMC. There was agreement among specialties that Buerger's disease was unlikely due to a short smoking history, presence of distal pulses, and negative skin biopsies for vasculitis. Subsequently, she developed osteomyelitis and required numerous amputations. She was later found to have an elevated lipoprotein A (Lp(a)). Niacin treatment was started to help reduce Lp(a). After niacin therapy, her condition significantly improved and she was discharged with indefinite warfarin dosing.

**Discussion** This case demonstrates how dry gangrene can have many etiologies. Interestingly, it has been determined that an elevated Lp(a) can lead to peripheral arterial disease. Lp(a) blocks the formation of plasmin and endogenous thrombolysis. This case can guide clinicians when diagnosing uncommon etiologies of dry gangrene.

**Conclusion** An elevated Lp(a) is an uncommon cause of dry gangrene, resulting from microvascular thromboembolic events.

169

### ERYTHEMA MULTIFORME MAJOR WITH ESOPHAGEAL INVOLVEMENT

T Waters\*, S Chen. UCSF Fresno, Fresno, CA

10.1136/jim-2017-000663.169

**Introduction** Erythema multiforme (EM) is an acute, immune-mediated condition resulting in target-like skin lesions. It is most often caused by infections, such as HSV or *Mycoplasma*. In some patients, mucosal lesions develop as well; these cases are differentiated by the name erythema multiforme major. The mucosal surfaces most often involved are the mouth, eyes and genitals. Extension of oral lesions to the upper airway or oesophagus has been infrequently described. We present a patient with *Mycoplasma*-induced EM major who developed a rare complication of severe esophagitis.

**Case presentation** EP, a 17 year old male with a history of recurrent oral and genital rash, presented with diffuse eruption of heterogeneous skin and mucosal lesions, preceded by several days of fever and upper respiratory symptoms. The skin lesions were initially bullous in nature, and progressed to tender, hyperpigmented, targetoid lesions. The oral and genital mucosae developed painful, erosive lesions as well. His oral pain was initially limited to the buccal surfaces, but soon progressed to severe odynophagia. Lab work-up included a positive test for *Mycoplasma pneumoniae* by PCR. Endoscopy was later performed and revealed severe esophagitis.

**Management/outcome** EP's *Mycoplasma pneumoniae* was successfully treated with azithromycin. His oxygen saturations and cough improved within a few days. However, his severe mucosal pain persisted. A course of methylprednisolone was begun, which was subsequently discontinued due to non-responsiveness and worsening odynophagia. Due to the severity of his esophagitis, the patient was made NPO and was started on total parenteral nutrition. Over the next few days, through a combination of antibiotics (for suspected esophageal super-infection), pain medications and supportive care, patient's status gradually improved, until he was again able to tolerate oral nutrition. He was transitioned to oral pain medications, and follow-up was scheduled with Dermatology and Rheumatology.

**Discussion** EM major can result in considerable morbidity, particularly in rare cases such as ours when mucosal involvement progresses to the oesophagus. We hope our case not only helps delineate the extent of complications related to EM major disease, but also highlights the importance of careful assessment for skin and mucosal lesions in patients with *Mycoplasma pneumoniae*.

## Poster session

## Community health

6:00 PM

Thursday, January 25, 2018

170

### IMPROVING NUTRITION IN PRESCHOOL AGED CHILDREN THROUGH IMPLEMENTATION OF A SCHOOL VEGETABLE GARDEN

M Eide\*. University of Washington School of Medicine, Boise, ID

10.1136/jim-2017-000663.170

**Purpose of study** Plummer, ID is the largest town on the Coeur d'Alene Reservation and lies in Benewah County. The county's rate of obesity is nearly 30%, which is above the



state's average. Introducing gardens and nutritional education at the local Head Start program (Early Childhood Learning Centre) aims to increase vegetable awareness and consumption in children in order to combat obesity and related health problems.

**Methods used** Through clinical observations and community interviews, it was evident that obesity is a health issue that the community of Plummer is concerned about. While the Coeur d'Alene Tribe provides several resources related to fitness and physical activity, there are fewer programs related to nutrition, so this appeared to be an ideal area in which to attempt improvement. Review of literature revealed that participation in gardening and nutritional education programs improved vegetable consumption in participating students and could potentially decrease their rate of metabolic disorders. The Head Start program in Plummer was an ideal partner for a similar project due to their passion for childhood education and nutrition.

**Summary of results** A literature review on vegetable consumption in children that took part in school gardening programs was shared with the educational director at the Early Childhood Learning Centre. Additionally, instructions on how to build garden beds and information on what vegetables grow well in the area were provided. Ideas on how to integrate school gardens into classroom time were also suggested. Examples include teaching lessons on basic nutrition, adding gardening terms to Coeur d'Alene language lessons, and developing lessons on historical American Indian farming practices. With this information, the Early Childhood Learning Centre is equipped to start a gardening program next spring if desired.

**Conclusions** The timing for implementation of this project was not ideal due to growing season length and landscaping renovation plans at the Early Childhood Learning Centre, but the school is enthusiastic about nutrition and is excited about providing gardens for their classrooms in the future if possible. This program has the potential to provide exposure to healthy food options and nutritional education that this group of children may not receive elsewhere, and it could be valuable for their lifelong health.

#### 171 IMPACT OF SEX AND REHYDRATING FLUID ON HYDRATION RECOVERY AND MUSCLE PERFORMANCE

E Hines\*, P Harris, D Keen, E Constantopoulos, M Koppinger, Z Khalpey, J Konhilas.  
University of Arizona, Tucson, AZ

10.1136/jim-2017-000663.171

**Purpose of study** Exercise and heat trigger dehydration and increase extracellular fluid (ECF) osmolality, leading to deficits in exercise performance. We wished to determine sex differences in exercise-induced dehydration and whether rehydration depended on sex or the type of rehydrating fluid.

**Methods used** Using a counterbalanced, crossover study design, female (n=8) and male (n=9) subjects performed a dehydrating exercise protocol under heat stress until achieving a loss in 3% body mass. Subjects rehydrated with either deep-ocean mineral water (Deep), mountain spring water (Spring), or a carbohydrate-based sports drink (Sports) at a volume equal to the volume of fluid loss. We measured hydration by salivary osmolality (Sosm) and exercise performance by peak torque leg extension at baseline, post-exercise, and post-rehydration.

**Summary of results** In response to exercise, females and males reached similar increases in heart rate, body temperature and peak Sosm. Male subjects took less time than females to reach 3% body mass loss resulting in significantly lower sweat rates in females compared to males. The rate of return to baseline Sosm did not depend on sex but was significantly affected by hydrating fluid; subjects receiving Deep as the hydrating fluid exhibited the most rapid return to baseline Sosm. Although males generated greater peak torque extension than females, we identified a significant effect of rehydrating fluid and sex on peak torque recovery.

**Conclusions** Males reached 3% body mass loss faster than females. Dehydration resulted in Sosm increases and muscle strength deficits similarly for males and females. The rate of rehydration was greatest when subjects consumed Deep. Recovery of muscle performance was affected by fluid and sex, with the main driver being the female sex.

#### 172 CONTINUITY OF CARE FOR PREGNANT MOTHERS: THE CLINIC AND BEYOND

A Markuson\*. University of Washington School of Medicine, Great Falls, MT

10.1136/jim-2017-000663.172

**Purpose of study** This project endeavours to improve pregnant women's fitness so as to reduce labour complications and negative birth outcomes, organise group visits, and help women achieve their breastfeeding goals in Lewistown, MT. This farming and ranching community offers many recreational fitness opportunities. Nevertheless, a 25% obesity prevalence persists. Worryingly, an upward trend of overweight adults was noted between 2011–2013, which the community noticed according to a community needs assessment. Lewistown's awareness demands programs to support the community.

**Methods used** A literature review demonstrated that exercise in pregnant women did not increase the risk to mother or fetus, is considered safe in the obese, and decreases risks of maternal or neonatal complications. Current ACOG guidelines encourage 20–30 min of moderate intensity exercise most days of the week after the first prenatal visit and until 38–39 weeks. Furthermore, this level of exercise is considered safe in the previously sedentary pregnant mother. The review also showed that group prenatal visits have equivalent obstetric outcomes compared to individual visits, increase the likelihood of appropriate gestational weight gain and loss, and breastfeeding initiation. Partnering with local physicians and organisations, we created and designed a program for this community.

**Summary of results** The project's goal was to decrease labour complications, reduce negative birth outcomes, and help mothers achieve their breastfeeding goals in a community prepared to receive such programming. To achieve this, establishment of a Pregnant Women's Walking Group (PWWG) with suggested walking and fitness program materials, prenatal group visit structure created, and connect with the established Drop In and Latch On breastfeeding support group. The incorporation of the PWWG and Prenatal Visits into the BSG would educate a specific demographic while targeting the community's concerns about obesity.

**Conclusions** The PWWG and Group Prenatal Visits design was well received by the community partner, several local organisations, and local obstetrics providers. Furthermore,

funds and incentives were secured for attendance incentives, although no cohort for prenatal visits has been established. Initial work with the Women's Health Council and Pregnancy Help Centre was initiated to provide additional funding and incentives.

**173 INTERGENERATIONAL ACTIVITIES PROGRAM (IGAP): PROMOTING MENTAL HEALTH IN ADOLESCENTS AND OLDER ADULTS IN THERMOPOLIS, WYOMING**

MN Olson\*. *University of Washington, Cheyenne, WY*

10.1136/jim-2017-000663.173

**Purpose of study** The Intergenerational Activities Program (iGAP) aims to improve mental health in adolescents and older adults in Thermopolis, WY by partnering the two age groups for bimonthly activities at the Hot Springs County (HSC) Senior Citizen's Centre. As a popular retirement community, over 24% of the town's population is over the age of 65. While there are many programs to support younger children and older adults, few programs exist to support local adolescents.

**Methods used** While speaking with community members, adolescent mental health was identified as an area of concern within the community. After reviewing literature on other intergenerational programs, a program was designed to bring adolescents and older adults together to improve mental health. Potential partners were contacted via phone and HSC High School and HSC Senior Citizen's Centre were identified as willing community partners. Meetings were held with representatives from both organisations to discuss their interest, explore logistical problems, and discuss the potential benefits of the program.

**Summary of results** iGAP was instituted by providing the community partners with an iGAP Program Guide. The guide included a demographic analysis and needs assessment, as well as portions of the literature review. It also included a detailed implementation plan, a personality assessment, a mental health assessment, and a suggest activities list.

**Conclusions** Strengths of the iGAP include utilising the large population of older adults in order to provide support to local adolescents, while improving mental health in both groups. Challenges to iGAP implementation include coordination between multiple community partners and identifying a faculty member from HSC High School or Lights on After-school Program to accompany the adolescents to the HSC Senior Citizen's Centre. Next steps include organising a meeting for the community partners, securing funding, and recruiting participants. If successful, the program could be expanded to include students at Thermopolis Middle School and older adults at the Wyoming Pioneer Home.

**174 ELLENSBURG WALKABILITY ASSESSMENT: LOOKING FOR AREAS IN NEED OF IMPROVEMENT**

S Printz\*. *University of Washington School of Medicine, Spokane Valley, WA*

10.1136/jim-2017-000663.174

**Purpose of study** The walkability assessment of Ellensburg aims to decrease obesity by being used as a tool to justify construction of sidewalks, which are a main source of physical activity

for many residents. Ellensburg has 19 786 residents and a 29% obesity rate. Accessibility to safe and walkable routes are often lacking in rural communities, but are needed by residents to be able to stay active and maintain a healthy weight.

**Methods used** In the clinic, it became apparent that obesity is a major health problem in Ellensburg and majority of patients indicated that walking was their main source of exercise. A literature search showed that when people move to an area with higher walkability they increase their physical activity. After meeting with the Kittitas Public Health Department (KPHD) a proposal was introduced to complete a walkability assessment, to justify improvement projects. Literature also showed that developing a community based partnership with a local university is helpful when developing solutions to community problems. For this project, a promising partnership was created between the KPHD and CWU's Centre of Leadership and Community Engagement (CLCE).

**Summary of results** The Built Environment Active Transportation assessment form and a literature review, demonstrating the significance of the project, were given to each partner. A meeting was facilitated between the KPHD's Health Promotions Supervisor and CWU's director of the CLCE. CWU committed to recruiting volunteers for the assessment and possibly running a fundraiser (5K walk) to fix a section of sidewalk. The CLCE has students majoring in graphic design that will make advertisements targeting public health majors and pre-medical students. The city of Ellensburg has been broken down into 12 sections and three volunteers will be assigned per section. It was agreed that the assessment will be completed by the end of the 2018–2019 academic school year.

**Conclusions** This project provides detailed data on the community's walkability, which can be used to apply for grants and inform the city of areas that need development. A challenge with this project will be finding volunteers, but the director of CLCE does not believe this will be a problem. This walkability assessment will be continued through the partnership of CWU and the KPHD. This project could be expanded by increasing the area assessed.

**175 CAREER EXPLORATION AND MENTORSHIP PROGRAM: NURTURING CAREER ASPIRATIONS FOR 5TH AND 6TH GRADERS IN GRAND COULEE DAM SCHOOL DISTRICT, WASHINGTON**

L Stolp\*. *University of Washington School of Medicine, Spokane, WA*

10.1136/jim-2017-000663.175

**Purpose of study** Grand Coulee Dam School District (GCDS) experiences a 62% graduation rate which is well below the Washington State average of 77%. Community analysis revealed concerns about low numbers of students pursuing postsecondary education. The Career Exploration and Mentorship Program (CEMP) aims to increase the likelihood of students in GCDS pursuing postsecondary education and/or professional careers.

**Methods used** Community interviews, performed over an 11 month period, surfaced concerns regarding a lack of student interest in postsecondary education and professional careers due to inadequate exposure to professional mentors. A literature review was completed to determine elements of youth career development and mentorship programs with known efficacy. During project proposal meetings/presentations, two community

partners were identified: GCDSD and Colville Tribes Education and Employment Department.

**Summary of results** Literature review suggested 1) Program durations <1 year revealed negative effects on student self-esteem and academic motivation 2) grades 5–6 experienced the greatest positive mentee impact 3) emphasis on mentor development and support was critical for program success, and 4) lack of culturally similar mentor was identified as a limitation in multiple studies. CEMP preliminary design was constructed and includes monthly 1:1 structured meetings, 2 annual group events focused on career exploration, mentors from culturally similar background who have completed post-secondary education and work as a professional, and mentees in grade 5–6 with at least 1 close family or friend who supports postsecondary education. CEMP preliminary design was presented to community partners and accepted for further development and collaboration. Local professional career opportunities and respective mentors have been identified.

**Conclusions** Curriculum, budget and mentor training is currently being constructed. Once complete funding will be requested through Colville Tribes Youth Development grants. CEMP will be piloted in winter of 2018–2019.

#### 176 MILES FOR SMILES: INCENTIVIZING EXERCISE TO IMPROVE MENTAL HEALTH IN MILES CITY, MT

A Vaughn\*. *University of Washington School of Medicine, Spokane, WA*

10.1136/jim-2017-000663.176

**Purpose of study** Montana has the second highest suicide rate in the country with suicide being the second leading cause of death in its adolescents. Custer County, which encompasses Miles City, has a rate of 8.90 adolescent suicides per 1 00 000 residents compared to the state average of 3.59. Suicide and depression are issues that not only impact adolescents throughout their childhood, but follow them into adulthood. The purpose of Miles for Smiles is to improve mental health by encouraging exercise in middle school students.

**Methods used** Community members including hospital board members, community nurses, and parents were interviewed. All revealed concerns regarding mental health in Miles City, especially in the younger population. A literature review was conducted, revealing that vigorous exercise is effective in improving depression and suicidal ideations in adolescents. It also showed competition to be a more successful method in encouraging adherence to exercise rather than only social support. Kyle Pryor, the health teacher at Washington Middle School, was contacted and agreed to be a partner in this project.

**Summary of results** A project was designed in which middle school students participate in a point-based exercise competition against fellow classmates in hopes of improving mental health. Vigorous physical activity is worth more points and students with the most points receive a prize. Mr. Pryor plans to implement this over students' school breaks. He was provided a flyer to send to the students, a review of the literature supporting the program, detailed instructions on how to implement this, and names of stores potentially interested in donating prizes.

**Conclusions** Miles for Smiles will encourage community middle school students to develop positive mental health habits

by engaging in a competitive exercise program. Mr. Pryor is enthusiastic to implement the program and his established relationship with the students may translate into increased involvement. One limitation may be receiving prize donations, however this will be addressed once the program is initiated. To expand this project, the community should involve other schools in Miles City, organise group events to encourage student motivation and healthy relationships, and obtain funding for prizes to further motivate involvement.

## Poster session

### General internal medicine and ageing

6:00 PM

Thursday, January 25, 2018

#### 177 HYPERBILIRUBINEMIA AND TRANSAMINITIS SECONDARY TO HYPEREMESIS GRAVIDARUM

S Kaur\*, T Hilvers, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.177

**Purpose of study** Nausea and vomiting is common in pregnancy beginning in the first trimester and usually resolves spontaneously by the second trimester. Hyperemesis gravidarum occurs in up to 2% of pregnancies and characterised by intractable nausea and vomiting and can be associated with severe dehydration, electrolyte imbalances and liver abnormalities, however, very rarely do patients present with bilirubinaemia and jaundice.

**Methods used** Retrospective case study.

**Summary of results** A 22 year old Hispanic female presented to the hospital at IUP of 5 weeks complaining of nausea and vomiting. Patient was treated with ondansetron and showed significant clinical improvement and was sent home with an anti-emetic and advised to follow-up with her Obstetrician. In August 2017, patient presented again to the emergency department at IUP of 13 and 4/7 with a chief complaint of severe nausea and vomiting and a significant weight loss of 37 pounds since the last visit. Physical examination was significant for scleral icterus, moderate RUQ tenderness, and tachycardia. On neurological examination there was bilateral motor weakness in both upper and lower extremities. Initial total bilirubin level was elevated at 6.3 mg/dl, conjugated bilirubin or 4.8 mg/dl, aspartate aminotransferase of 416 U/L, alanine aminotransferase of 869 U/L and alkaline phosphatase of 92 U/L. Hepatitis panel was nonreactive. Ultrasound of the gallbladder showed coarse echogenicity of the liver suggestive of a cirrhotic liver and sludge within the gallbladder with no mass or cyst and normal appearing bile ducts. She underwent an MRI of the abdomen which showed no evidence of common bile duct obstruction or filling defect. MRCP was performed which was also negative for any biliary obstruction.

**Conclusions** Hyperemesis gravidarum could associate with liver dysfunction and elevations in liver enzymes in 15% of cases with a rare occurrence of jaundice without underlying liver disease. Management is supportive with hydration and the condition resolves with the treatment of hyperemesis gravidarum.



## 178 ANOTHER CAUSE OF ACUTE PANCREATITIS

A Parekh\*, S Ragland. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.178

**Case report** Acute Pancreatitis results from inflammation of the pancreas resulting in abdominal pain and elevated pancreatic enzymes in the blood. The pathogenesis is not well understood but a number of conditions are known to induce acute pancreatitis. In United States of America, more than two-third of cases are due to gallstone and chronic alcohol abuse. We present a case of a 58 year old Filipino male with past medical history notable for insulin-dependent diabetes mellitus with complications of retinopathy and nephropathy resulting in chronic kidney disease stage V and hypertension who presented to emergency department complaining of nausea and vomiting of 3 days duration. Patient had increasing fatigue and lethargy but alert and oriented to time, place, and person. Laboratory workup returned significant for BUN 115, Creatinine 12.80, Potassium 5.3, bicarbonate 12, and lipase 843. Alcohol level negative. Emergent dialysis was performed and patient's gastrointestinal symptoms along with abdominal pain subsided. Uremia means urine in the blood and can occur in later stages of kidney disease or in sudden severe acute kidney injury. Clinical manifestations of uremia is not well understood and there is no single toxin that accounts for the syndrome. Elevated levels of pancreatic enzymes have been reported in patients with renal insufficiency either due to decreased urinary excretion or pancreatic damage. Masoero et al. reported on very high levels of pancreatic enzymes in hemodialysis patients which could be due to the metabolic derangement secondary to long-term dialysis. In the study by Masoero et al. ultrasound did not detect any pancreatic abnormalities. Padilla et al. reported on significant elevation of the calcium x phosphate product in end-stage renal disease patients who developed acute pancreatitis without any known precipitating factors. In this patient, the total serum calcium-phosphorus product was 56.28 mg2/dl2. National Kidney foundation recommends the total serum calcium-phosphorus product should be maintained at <55 mg2/dl2. This control can be maintained by decreasing phosphorus level while maintaining the target range. In our patient, the acute pancreatitis resolved after the first hemodialysis. Uremia can present in multiple ways. This is a unique presentation of uremia associated with acute pancreatitis.

## 179 HYSTERICAL HEMIPARESIS: CASE SERIES

A Parekh\*, G Petersen, K Sabetian. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.179

**Case report**

**Background** Bell's palsy is also known as acute peripheral facial nerve palsy of unknown cause. The classic presentation is sudden onset of unilateral facial paralysis. There is an increased risk during pregnancy and in diabetics.

**Methods** In this descriptive analysis, 10 patients were identified with inclusion criteria of presenting with Bell's Palsy with hemiparesis. Data was collected through uniform query of community hospital database. Data was collected on patient demographics, medical history, social history, and neuroimaging.

**Results** Bell's palsy symptoms persisted while resolution of hemiparesis. All patients had negative neuroimaging. Complications of Bell's palsy can include non-haemorrhagic stroke. Treatment of Bell's palsy can include corticosteroids and antiviral therapy.

**Conclusion** Hysterical hemiparesis can be due to anxiety or fatigue, however, one should be vigilant as there have been reports of stroke being misdiagnosed as Bell's palsy.

## 180 NOT JUST A RASH

A Parekh\*, A Sandhu, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.180

**Case report** Eosinophilic myositis is a form of inflammatory muscle disease which is infrequent and sometimes classified as a form of polymyositis. A known cause of this syndrome is a chronic parasitic infection but commonly associated with certain drugs or products. We present a case of middle aged woman who presented with constitutional symptoms (fever, rigours, and generalised body aches) and 2 days later having a profuse eruption of erythematous macules and papules on face and arms which progressed to her trunk, back, and lower extremities. Patient had developed a drug reaction to Tegretol and with minimal bilateral lower extremity weakness which was attributed to DRESS syndrome and rhabdomyolysis. Patient was treated conservatively with fluids, however, rash improved but the symmetrical muscle weakness progressed drastically. Laboratory workup returned positive for anti-CCP antibodies and cryoprecipitate. Patient underwent a muscle biopsy which returned positive for eosinophilic myositis. Patient responded to steroids with improvement of muscle weakness gradually. We present a case of unique form of myositis associated with vasculitis and symmetrical polyneuropathy and with favourable response to steroids.

## Poster session

## Genetics

6:00 PM

Thursday, January 25, 2018

## 181 PRENATALLY IDENTIFIED KIDNEY AND URINARY TRACT ABNORMALITIES IN 17Q12 DELETION

<sup>1</sup>EE Bodle\*, <sup>1</sup>A Richardson, <sup>1</sup>M Homeyer, <sup>1</sup>SR Hintz, <sup>1</sup>PC Grimm, <sup>1</sup>Y Blumenfeld, <sup>2</sup>C McDougall, <sup>2</sup>E Zackai, <sup>1</sup>L Hudgins. <sup>1</sup>Stanford University, Stanford, CA; <sup>2</sup>Children's Hospital of Philadelphia, Philadelphia, PA

10.1136/jim-2017-000663.181

**Purpose of study** Congenital abnormalities of the kidney and urinary tract (CAKUT) include a wide range of anomalies from hyperechogenic kidneys on prenatal ultrasound to cystic kidneys to renal agenesis to abnormalities involving the collecting system. One recently recognised cause of these findings is a recurrent deletion involving 17q12 that encompasses the *HNF1B* gene. We report five cases of 17q12 with widely variable prenatal manifestations suggesting that this microdeletion



may be a common cause of renal and urinary tract abnormalities detected *in utero*.

**Methods used** Cases of 17q12 deletion with prenatal ultrasound findings were identified.

**Summary of results** Five previously unreported cases of 17q12 loss were identified, all including the *HNF1B* gene. All five patients had renal abnormalities on prenatal ultrasound: Echogenic kidneys in 3, cysts or cystic dysplasia in 3, and evidence of severe obstruction in 2. Preservation of pyramids was seen in one, which is inconsistent with ARPKD. Two pregnancies were terminated. The remaining 3 patients were ages 5 weeks, 2 years, and 7 years at last evaluation and had not experienced renal failure.

**Conclusions** Deletion 17q12 was the second most common microdeletion reported in a large group of prenatal patients who had aCGH (Wapner et al., 2012). Major findings include structural renal anomalies, mature onset diabetes of the young, and some degree of developmental delay or learning disability in ~50%. Autism and schizophrenia have also been reported. While Jones et al. (2016), have suggested offering prenatal testing for 17q12 deletion in all prenatally diagnosed cases with echogenic kidneys, the findings in our case series would suggest that this testing also be offered for prenatally detected renal cysts and/or evidence of obstruction. It is important to distinguish 17q12 deletion from other diagnoses associated with CAKUT as the prognosis for renal function and the presence of associated findings are distinct and may influence pregnancy and postnatal management.

## 182 USING ANCESTRY TO FIND HIDDEN DISEASE VARIANTS IN THE CANCER GENOME ATLAS

A Panzer\*, J Costello. *University of Colorado School of Medicine, Aurora, CO*

10.1136/jim-2017-000663.182

**Purpose of study** Large genomic studies like The Cancer Genome Atlas (TCGA) are enabling a better understanding of cancer, especially in identification of ‘driver’ mutations. Because drivers represent initiating events in tumorigenesis they are found in most instances of a cancer type and are readily extracted from these datasets. Unfortunately, the presence/absence of driver mutations alone often does not well predict disease development or progression. Cryptic ‘modifier’ genotypes in the genetic background interact with and determine the ultimate effect of primary genetic insults. When these modifiers are rare or subgroup-specific, discovery demands either a more robust sampling strategy than is practically feasible OR a sample stratification strategy that enables local enrichment of rare variants in downstream analysis. Self-reported race is used to subdivide study samples in analysis in hopes that grouping more related individuals will highlight mutations relevant to certain lineages, but this strategy is ineffective since simple racial categories are poorly representative of underlying genetic diversity. We hypothesise that ancestry inference algorithms, which infer relatedness directly from individuals’ genetic data, will offer a superior stratification strategy.

**Methods used** We used Genome Analysis Toolkit to call variants from the sequence data of TCGA patients. These variants were input to ancestry inference programs, including ADMIXTURE, LASER and DietNet (23 and Me/Ancestry.com), for clustering of patients according to their genetic

similarity to one another (unsupervised) or to 1000 Genome global SNP profiles (supervised) based on genomewide allele frequencies. Using these groupings, we recapitulated the genetic association and differential expression analyses in the TCGA data pipeline.

**Summary of results** Our clustering of TCGA revealed demographics beyond that found by self-reported ethnicity, implicated previously discovered and novel disease variants, and suggested associations between particular racial/ethnic groups and different driving alterations that may underlie observed disparities in cancer burden.

**Conclusions** In addition to yielding additional insight on the genetic aetiology of various cancers, these results suggest that ancestry-based clustering may be a useful technical innovation applicable to almost all large human genomics projects.

## 183 MUTATIONS IN LIPASE MATURATION FACTOR 1 AS A CAUSE OF HYPERTRIGLYCERIDEMIA

R Thomas\*, W Ji, C Bedoya, M Peterfy. *Western University of Health Sciences, Pomona, CA*

10.1136/jim-2017-000663.183

**Purpose of study** Hypertriglyceridemia (HTG) is an abnormally high serum concentration of triacylglycerol (TAG) and has been linked to increased risk of atherosclerosis, acute pancreatic disease, and coronary artery disease. A major determinant of serum TAG level is lipoprotein lipase (LPL), which hydrolyzes TAG in adipose, cardiac and muscle tissue. Whereas the regulation of LPL activity in the circulation has been well studied, the molecular mechanisms involved in the expression of active enzyme in cells producing LPL are poorly understood. Our lab previously identified Lipase Maturation Factor 1 (LMF1), a chaperone critically required for the post-translational maturation of LPL. LMF1 interacts with LPL in the endoplasmic reticulum (ER) and is necessary for LPL to achieve its catalytically active homodimer configuration. LMF1-deficient cells are unable to produce active LPL and mice and humans harbouring rare homozygous LMF1 mutations exhibit lipase deficiency and HTG. While these observations demonstrate the role of LMF1 in lipid metabolism, it remains unclear whether genetic variation in LMF1 contributes to common forms of HTG in the population. The goal of the present study is to address this question by the functional analysis of LMF1 sequence variants associated with HTG.

**Methods used** We have identified over 50 heterozygous LMF1 point mutations from HTG patients. Using bioinformatic analysis, we predicted a set of likely functional variants, which were introduced into Luciferase-LMF1 fusion constructs by site-directed mutagenesis. The impact of mutations on the lipase-maturation activity of LMF1 was assessed in an *in vitro* assay based on the reconstitution of LPL activity in transfected LMF1-deficient cells by mutant LMF1 constructs. Using luciferase assays, we also evaluated the effects of mutations on LMF1 expression and stability.

**Summary of results** Our ongoing analysis has already revealed novel truncating and missense LMF1 mutations that affect the activity and/or expression level of LMF1.

**Conclusions** These results confirm the role of LMF1 variants as a cause of HTG and provide insights into LMF1 structure-function relationship. Our data also highlight LMF1-mediated lipase maturation as a potential therapeutic target in the treatment of HTG and associated morbidities.

## Poster session

## Health care research

6:00 PM

Thursday, January 25, 2018

## 184 MEDICAL STAFF ENGAGEMENT THROUGH PHOTOVOICE

<sup>1,2</sup>D Courtemanche, <sup>1,2</sup>H Woo, <sup>1,2</sup>D Duffy, <sup>1,2</sup>B Fashola, <sup>1,2</sup>L Adamjee\*. <sup>1</sup>BC Children's Hospital, Vancouver, BC, Canada; <sup>2</sup>University of British Columbia, Vancouver, BC, Canada

10.1136/jim-2017-000663.184

**Purpose of study** Research studies have shown that medical staff engagement is vital to organisational performance. Participatory action based research creates an opportunity for individuals to advocate for change in their communities. There is limited literature to suggest this method has been used with medical staff. Thus, our objective was to engage medical staff at BC Children's and Women's Hospital by employing Photovoice as a tool for participatory action research.

**Methods used** The medical staff at the hospital were asked to answer four questions through Photovoice. The questions asked about quality improvement, safety, wellness, and communication. Participants responded to questions by taking photographs and creating associated captions. The photos and captions were curated and analysed to find common themes.

**Summary of results** Twenty-five photos were submitted.

The major themes of the photos included: work-life balance, things we need to do our jobs, things we believe the patients need, and the great team we work with. The question that elicited the highest response was: 'What is your highest quality improvement priority?' It had 17 responses. Analyses of the captions showed the words high, quality, care, healthy, patient to be some of the most mentioned.

**Conclusions** The workplace culture in healthcare is not suitable for Photovoice as a research method. The qualitative nature of the research and the culture of opposition to photos in this workplace were significant barriers to our study. Despite this, participant's photos showed that patient advocacy, work-life balance, work community, and organisational support were important themes among medical staff members.

## 185 DO PSYCHOLOGICAL SAFETY AND GRUMPINESS VARY BY PROFESSIONAL DISCIPLINE? AN ANALYSIS OF VA HEALTH TRAINEES

DA Deemer\*. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.185

**Purpose of study** Academic leaders rely on perceptions surveys to assess the clinical learning environments (CLE's) they offer health professions trainees. While survey responses are often assumed to reflect trainees' thoughts about their experiences, they can also be impacted by personal factors beyond the control of the academic faculty. We aim to better understand trainees' general discontent, or 'Grumpiness,' by directly measuring Grumpiness using a set of standardised questions, and then assessing *Hypothesis I*: Does Grumpiness vary among trainee disciplines? *Hypothesis II*: Do factors associated with

the CLE, such as psychological safety (PS), associate with Grumpiness?

**Methods used** We analysed VA Learners' Perceptions Survey responses between 2011–2017 on n=88 720 health professions trainees. We computed Grumpiness based on responses to three 5-point satisfaction items selected for their anticipated homogeneity at the same facility and within the same academic year. Grumpiness scores were computed as the difference between a responder's mean response to the three satisfaction items, and the mean response for all responders at a given medical centre and academic year. A two-item questionnaire was used to assess PS on a 5-point Likert scale. Associations were analysed using Generalised Linear Models, computed with SPSS, that accounted for ordinal scales.

**Summary of results** Grumpiness was pervasive among medical students and residents, and relatively absent among associated health trainees. Adjusting for the mix of patients seen, facility service complexity, trainee gender, and academic level, we found Grumpiness varied by  $-0.188\sigma$  ( $p<0.001$ ) per mean one level increase in PS (5-point Likert scales) for medical trainees,  $-0.450\sigma$  ( $p<0.001$ ) for nursing students, and  $-0.403\sigma$  ( $p<0.001$ ) for associated health trainees. Differences in PS ( $p<0.001$ ), Grumpiness ( $p<0.001$ ), and PS-Grumpiness associations ( $p<0.001$ ) are reported for the 26 health professional disciplines examined. We found that professions which reported lower PS (i.e., medical trainees) also scored higher on Grumpiness ( $p<0.001$ ).

**Conclusions** In this national, multi-year study, we found that even if program directors were to provide for a highly psychological safe CLE, medical students and residents would continue to score higher on our Grumpiness index than their nursing and associated health counterparts.

## 186 APPLICATION OF PROMIS INSTRUMENTS TO SUB-POPULATIONS OF INTEREST

EJ Lakey\*, SE Anderson, P Kumparatana, J Roberts, KJ Hunt. University of Colorado School of Medicine, Denver, CO

10.1136/jim-2017-000663.186

**Purpose of study** The Patient-Reported Outcomes Measurement Information System (PROMIS) is a series of metrics that were introduced by the NIH in 2004. By utilising item-response theory with computer-adaptive testing, PROMIS instruments can assess patient-reported outcomes in dozens of domains with fewer questions, minimal floor and ceiling effects, and minimal loss of precision. PROMIS data are reported separately for each domain on a scale of 0 to 100, with a mean of 50. PROMIS scores were calibrated from Medicare and disability databases and it is unknown if these scores are representative of sub-populations of interest to the orthopaedic provider. This study aims to test the hypothesis that mean PROMIS scores for these sub-populations will not differ from NIH population mean values.

**Methods used** Participants from two state university institutions were recruited to complete a voluntary one-time survey administered through REDCap during a three-month period starting in May 2017. The survey included the following PROMIS domains: Pain Interference, Physical Function, Mobility, Social Functioning, Depression, and Global Health. Respondents were grouped into one of three categories:

1. Elite Athletes were defined as students-athletes on an NCAA Division 1 roster (n=38);
2. Medical Students (n=15); and
3. Residents/Fellows (n=76).

Data were analysed using SAS 9.4 using Tukey-Kramer pairwise comparisons and one-sample t-tests, where appropriate. A  $p$ -value  $< 0.05$  was considered statistically significant.

**Summary of results** Mean PROMIS scores for both Elite Athletes and Residents/Fellows differed from the population mean across all PROMIS domains ( $p < 0.01$ ). Mean PROMIS scores for Medical Students differed from the population mean for Physical Functioning, Pain Interference, Mobility, Social Functioning, and Global Health (Physical) ( $p < 0.01$ ). Mean PROMIS scores for Medical Students did not differ from the population mean for Depression ( $p = 0.4780$ ) or Global Health (Mental) ( $p = 0.6623$ ).

**Conclusions** These data suggest that NIH mean PROMIS domain scores may not be generalizable to subpopulations of interest. This demonstrates the importance of caution with PROMIS score interpretation in the clinical setting and highlights the need for more research.

#### 187 MITIGATING BURNOUT IN RESIDENTS VIA A CLINICAL PRACTICE TOOL

H Lokos\*, I Walters, A Khait, C Vercio. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.187

**Purpose of study** Physician burnout is a very real issue in medicine today. Burnout affects twice as many physicians as matched controls, affecting 40%–70% of U.S. paediatric residents alone. Burnout is dangerous, both for patients and physicians. It is linked to higher rates of medical errors as well as depression. Much research has gone into searching for causes and solutions. Many physician wellness programs, aimed to prevent and mitigate burnout, have been successful. However, to our knowledge, there is no clinical communication tool to specifically promote meaningful communication and mitigate burnout. Thus, our purpose was to see if our institution's Connect-Listen-Explore-Acknowledge-Respond (CLEAR) approach to patient communication, developed by Dr. Carla Gober and her team, could be used to decrease resident burnout.

**Methods used** Burnout is well defined by the Maslach Burnout Inventory (MBI), a validated 22-item questionnaire with three dimensions: emotional exhaustion, depersonalization and lack of personal accomplishment. Forty-two categorical paediatric residents (11 male, 31 female) were enrolled with 20 assigned to the intervention group and 22 to the control group. A series of three one-hour workshops were given to teach the CLEAR approach via a combination of didactics, video case studies, group discussions, and role-playing exercises. Study objectives were measured by pre- and post-tests. The MBI was administered at baseline, immediately after the intervention, and one month after the study. Data was collected confidentially and stored securely via Qualtrics.

**Summary of results** The learner satisfaction index, on a scale of 1–3, with 1=poor, 2=good, 3=excellent, averaged at 2.74. Likewise, in terms of meeting learning objectives, statistically significant changes were seen with  $p \leq 0.05$  for 7 of 9 objectives.

**Conclusions** Utilising a patient-centred clinical communication tool could help decrease burnout. We anticipate that further analysis of the MBI data will show statistically significant differences between both groups in two of the three dimensions of the MBI: emotional exhaustion and depersonalization, two areas predominantly affected by burnout. It is known that unwell physicians provide poor patient care. Perhaps improved patient-centred care competencies can also improve physician wellness.

#### 188 A NEEDS ASSESSMENT OF ONLINE CLEFT LIP AND PALATE EDUCATIONAL VIDEOS FOR PARENTS

<sup>1,2</sup>K Spoyalo\*, <sup>1,2</sup>R Courtemanche, <sup>1,2</sup>E Henkelman. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>BC Children's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.188

**Purpose of study** The Internet provides an abundance of easily accessible information about cleft lip and palate. Increasingly, parents access this information at the time of diagnosis or throughout their child's course of treatment. Previous studies have evaluated the quality of medical educational videos using standardised checklists and professional opinion. However, there has been limited input from families into both the development of online resources as well as the assessment of their quality. This research study aimed to determine what parents value in an educational online video and evaluate whether parent's needs are met with the currently available videos.

**Methods used** In this qualitative prospective study, parents of children with cleft lip and palate were purposively sampled and invited to participate in 90 min focus groups at British Columbia Children's Hospital. The focus groups were conducted using open-ended semi-structured questions and the sessions were audio recorded and transcribed. The text was then de-identified and analysed for themes by hand and with NVivo qualitative analysis software (QSR International Pty Ltd. Version 11, 2015).

**Summary of results** From the two focus groups (n=11), 5 themes were identified that captured parent information needs. There was general consensus that helpful topics would include a series of online 'step-by-step' videos that address issues that parents face such as feeding, lip taping, and preparing for surgery. In addition, there is need for resources targeted at various audiences, including videos for children to help them understand their own condition or for parents who are adopting children diagnosed with a cleft lip and palate. Participants expressed the need for accessible and consolidated information located in an online 'hub' governed by a trusted source. Lastly, parents desired videos to be relatable; featuring real families and children born with cleft lip and palate as a means of relaying information.

**Conclusions** Through the thematic analysis of our focus groups we were able to find many discrepancies between the reality of available online information and what parents desired, thus revealing areas for improvement. Ongoing research is directed at evaluating online cleft lip and palate videos based on the identified parent needs.



## Poster session

## Infectious diseases

6:00 PM

Thursday, January 25, 2018

### 189 A CASE OF COCCIDIOIDOMYCOSIS DISSEMINATED TO THE KIDNEY

J Coleman\*, A Heidari, B Shoua, S Hillyer. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.189

**Purpose of study** Coccidioidomycosis (cocci) a predominantly pulmonary disease is a dimorphic fungus endemic to South-west US. In less than 5% cases it can become disseminate which complicates the course and prolongs the treatment. We are describing a unique form of dissemination to the parenchyma of kidney with abscess formation. In our experience and review of the literature this has never been reported before.

**Methods** Retrospective chart review.

**Summary of results** This is a 56 year old Male oil field worker from San Joaquin valley California in his usual state of health until 4 years ago when he was first diagnosed with pulmonary cocci. At that time his cocci complement fixation (CF) titers was 1:128. He was treated with 3 month of fluconazole and stopped to follow. 2 years later he was hospitalised and diagnosed with new onset uncontrolled diabetes with HbA1c of 15%. During that admission he was found to have a complicated pneumonia with loculated empyema which was drained and grew *Strep agalactiae*. His cocci CF titers came back as 1:8. He was again given short course of fluconazole along with antibiotics and stopped to follow. 2 years later he present to our facility for progressive back pain, fatigue and 20 lbs. weight loss. Abdominal CT showed a 15 × 11 × 16 cm left renal mass with cystic and solid components. He underwent fluoroscopic guided drainage and had 800 ML of purulent fluid which grew coccidioides immitis. His cocci CF titers reactivated to >1:512. He was restarted on 800 mg of fluconazole and being co-managed by infection disease and urology at this time and is going for repositioning of his drain.

**Conclusions** To the best of our knowledge this is the only reported case of dissemination of coccidioidomycosis to kidney with abscess formation. Duration of therapy is unknown in our experience will treat for at least 36 months.

### 190 A CASE OF SALLMONELLA ENTERICA AORTITIS WITH SACCULAR ANEURYSM AND RETROPERITONEAL ABSCESES

A Ammar, J Coleman\*, G Petersen, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.190

**Purpose of the study** Salmonella intends to seed into aorta anomalies such as atherosclerosis or aneurysm. We are describing an extreme case of overwhelming infection with salmonellosis with expansion to retroperitoneal structures and psoas muscle presenting with compression fracture.

**Methods** Retrospective chart review.

**Summary of results** Patient is a 70 year old male with uncontrolled diabetes (A1C of 11.9), heart failure, 53 pack year smoking, 40 years of 12 beers (both stopped about 10 years ago) presented to our hospital for lower back pain after witnessed ground level fall.

Initial work up showed old T8 and new T12 wedge fracture. His labs showed WCB count of 13.4, with neutrophil count of 12.2 (84%) and Bands of 9%, AlkPhos of 338, Albumin 2.0, CRP 15.0. After consultation with neurosurgery plan was to discharge home with TLCA brace which was expected to arrive a day after. Prior to discharge he had a blood culture which became positive for gram negative rods. A CT abdomen/Pelvis was obtained to identify the source of the bacteremia, and a large saccular aneurysm from the posterior wall of the mid abdominal aorta measuring 9.5 cm × 6.3 cm was found. As well as multiple retroperitoneal abscesses containing air in the aneurysm and within the psoas muscles bilaterally, as well as three additional large abscesses (11 cm, 19 cm, and 10 cm) in diameter. He was started on piperacillin/tazobactam. Final blood culture result came back as salmonella enterica and his treatment was changed to ceftriaxone. He was transferred to higher level of care for vascular surgery. Intraoperatively he had drainage and debridement of retroperitoneal abscesses and found to have erosion of the posterior segment of the aorta with 9.6 cm mycotic infra-renal aortic aneurysm, underwent resection of the affected part of aorta and placement of cryograft. He was continued on 6 weeks course of antibiotics with 2 months telephonic follow up doing well per family.

**Conclusion** Clinician should be aware of salmonella as one of the unique organism that has the propensity to seed and infect any abnormal anatomy or endothelial injury of aorta.

### 191 A CASE OF DAPTOMYCIN RESISTANT METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS INFECTIVE ENDOCARDITIS WITH PACEMAKER LEAF VEGETATION AND MIC CREEP

GV Dalben\*, A Heidari, T Parker, O Meave, A Ghandforoush. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.191

**Purpose of study** Methicillin-Resistant *Staphylococcus aureus* (MRSA) endocarditis is a serious infections requiring prompt medical treatment, antibiotics, and elimination of source to ensure positive outcomes. The purpose of this case report is to illustrate a case of daptomycin resistant endocarditis.

**Methods used** Retrospective chart review.

**Summary of results** This is a 60-year-old Hispanic male with T2DM, cirrhosis due to hepatitis C, and a pacemaker due to Sick Sinus Syndrome, who was admitted to our hospital and found to have MRSA bacteremia. Physical exam showed a sinus tract from the site of prior triamcinolone injections to his left ankle. About a year prior, he was diagnosed with MRSA bacteremia and septic arthritis of the same joint, and was treated with a 3 week course of ceftaroline, which caused pancytopenia. During the current admission, imaging of his left ankle confirmed bony destructions with lytic lesions to the talus, distal fibula, and tibia but, per podiatry, he was not a surgical candidate. He was then started empirically on vancomycin. Sensitivity of MRSA via E-test showed MIC for Vancomycin 0.75, daptomycin 0.75, telavancin 0.47, and ceftaroline 0.50. Vancomycin was then changed to daptomycin



to prevent kidney injury. Transthoracic echocardiogram showed no vegetation. However, a transesophageal echocardiogram, done 6 days later, showed multiple string-like echogenic mobile masses connected to the lead of his pacemaker at the right atrium. He also had persistent MRSA bacteremia and his sensitivities showed a MIC creep for daptomycin to 3 and for vancomycin to 1.5 in only 9 days. Daptomycin was stopped and telavancin started. He was then sent to an outside facility to have his pacemaker and lead extracted. There, he developed line sepsis due to *Klebsiella pneumoniae*, to which he was given ciprofloxacin. He also developed acute renal failure requiring dialysis. The patient was then transferred back 2 weeks later and continued on telavancin. He went on to develop hepatorenal syndrome and later passed away.

**Conclusions** Clinician should be aware of developing MRSA resistance during antimicrobial therapy when there is an infected hardware present or the source of infection has not been controlled.

## 192 TWO FAMILIAL CASES OF WEST NILE VIRUS (WNV) MENINGITIS IN AN ENDEMIC AREA IN CENTRAL CALIFORNIA

GV Dalben\*, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.192

**Purpose of study** WNV is a zoonotic pathogen kept in an enzootic cycle through transmission between viremic birds and bird-biting mosquitoes. But, in late summer and early fall, WNV can also infect humans and other animals. Since 2004, there have been 467 cases in Kern County. We are describing 2 spouses acquiring infection sequentially in endemic areas.

**Methods used** Retrospective chart review.

**Summary of results** A 61-year-old Hispanic male was admitted to our hospital in the middle of August for a 2 week history of fronto-occipital headache accompanied by fever, chills, lightheadedness, tremors, loss of appetite and nausea. The patient had leukocytosis (11.1) and neutrophilia (8.0). Brain MRI was unremarkable. Lumbar puncture (LP) result showed high opening pressure (270), elevated protein (98), glucose of (58), WBC (91), 72% neutrophils and 8% lymphocytes. He was started on antibiotics, antifungal, and antiviral empirically. His CSF WNV CSF IgM came back positive and rest work up was negative. He was discharge with supportive measures without complications.

One week later, his wife, a 58 year-old Hispanic female, with hypertension and T2DM, presented complaining of a 2 day history of intractable, fronto-occipital headache, accompanied by the same symptoms as his. On admission, she had fever (101.9 F), leukocytosis (11.2), and CSF showed leukocytosis (66), neutrophils 77% and lymphocytes 22%, and elevated protein (65) and glucose 119. Chest x-ray and brain CT were unremarkable. She was started on antibiotics empirically. A second LP 2 days later showed increased leukocytosis (320), lymphocytes 54% and neutrophils 37%, and increased glucose (79) and protein (80). She had additional episodes of fever ranging 101.5–102.8 F during her hospital stay. Her CSF WNV IgG and IgM both came back positive. She was also discharged with supportive measures without complications. In our contact with the local public health department, by the time of the writing of this abstract, there were 14 cases of

WNV infection in Kern County and a total of 174 cases reported in California.

**Conclusions** Clinicians should be aware of persistent incidence of West Nile Virus neuro-invasive infections in endemic areas.

## 193 PATIENT WITH 40 YEAR HISTORY OF COCCIDIOIDAL MENINGITIS

C D'Assumpcao\*, A Heidari, R Johnson. *Kern Medical – UCLA, Bakersfield, CA*

10.1136/jim-2017-000663.193

**Purpose of study** Meningitis is the most feared form of extrapulmonary coccidioidomycosis caused by *Coccidioides immitis* or *Coccidioides posadasii*. Treatment of choice is high dose of oral fluconazole daily. If this clinically fails, options are to change to another azole, or to initiate intrathecal Amphotericin B therapy. For the most common complication, hydrocephalus, a shunt is required. Duration of therapy is considered to be indefinite. Presented here is an active case of coccidioid meningitis whose treatment has been continuous for 40 years.

**Methods used** Retrospective case report.

**Summary of results** 54 year old Caucasian male was initially diagnosed with coccidioid meningitis at age 14. Patient received intrathecal amphotericin B deoxycholate from age 14 to 29 via ventricular cistern. CN VIII was gradually damaged during this time. When fluconazole became available in 1991, patient was started on 400 mg daily. This was gradually increased to 1200 mg daily over the next decade as CSF cultures continued to be positive. Mild hydrocephalus was initially detected at age 29. By age 33, a VP shunt was required, requiring 2 revisions. Patient also developed neurogenic bladder and erectile dysfunction related to lumbar arachnoiditis and hypokalemic paralysis related to fluconazole therapy. Other medical issues include seizure disorder diagnosed at age 4 and treated with Dilantin for 30 years, coronary artery disease with two MIs and DES placement in January 2016, hypertension, and hyperlipidemia. Highest education level achieved is high school. Currently he is on 1200 mg of fluconazole daily.

Patient has been clinically stable for more than a year and is adherent to therapy. Nuclear bone scans and full body x-rays have not detected other sites of extrapulmonary coccidioidomycosis. Most recent serum serology revealed CF of 1:8. CSF serology revealed CF of 1:1.

**Conclusions** To our knowledge, this is the longest surviving coccidioid meningitis patient. Indefinite azole suppressive therapy is needed.

## 194 OPHTHALMOMYIASIS CAUSED BY SHEEP BOT FLY (*OESTRUS OVIS*) IN CENTRAL VALLEY, CALIFORNIA, UNITED STATES

C D'Assumpcao\*, A Bugas, A Heidari, S Sofinski, R McPheeters. *Kern Medical – UCLA, Bakersfield, CA*

10.1136/jim-2017-000663.194

**Purpose of study** Ophthalmomyiasis externa is the infestation of superficial external ocular structures by dipterous larvae. The most common cause of human ophthalmomyiasis is *Oestrus ovis*, sheep nasal bot fly, which affects shepherds and

farmers. Dallas, Texas (2003) and Hawaii (2004) have recently reported cases. Presented here is first documented case of *O. ovis* ophthalmomyiasis in California since 1984 on Catalina Island.

**Methods used** Retrospective case review.

Identification of larvae by pathological examination on saline wet mount with light microscopy and comparison with standard entomologic texts.

**Summary of results** 16 year old male with past medical history of recurrent sinusitis and otitis media requiring bilateral tympanostomy and tonsillectomy at age 4 as well as environmental allergies requiring desensitisation presented with 1 day history of irritation, redness, and 'swimming' foreign body sensation in left eye. Patient was participating in after-school sports activity on a recently fertilised grass field in a southern San Joaquin Valley municipality in California. Patient finished practice but his left eye became increasingly irritated and was not relieved with artificial tears or tap water irrigation. He had left conjunctiva injection, intact extraocular movements, and 20/20 visual acuity. On slit lamp exam, multiple larvae were seen in the bulbar conjunctiva and palpebral fornix of the left eye that did not appear to be burrowing. Between the patient and the emergency room staff, 11 larvae were removed. Patient was treated with Polymyxin B ophthalmic solution for 10 days. Prophylactic albendazole tablets were prescribed. Ophthalmology exam confirmed clearance of larvae. Family history was significant for diabetes, hypertension and dyslipidemia. Travel history limited to southern San Joaquin Valley, California. Patient denied livestock exposure in his neighbourhood.

**Conclusion** Use of manure fertiliser sourced from grazing fields should be limited to prevent spread. Complications include ophthalmomyiasis interna and auricular, nasal, pharyngeal or laryngeal myiasis. There is no systemic treatment for this condition, only mechanical removal. Antibiotics can prevent bacterial co-infection.

#### 195 A CASE OF *MAGNUSIOMYCES CAPITATUS* PERITONITIS

C D'Assumpcao\*, A Heidari. Kern Medical – UCLA, Bakersfield, CA

10.1136/jim-2017-000663.195

**Purpose of study** *Magnusiomyces capitatus*, previous known as *Geotrichum capitatum*, *Trichosporon capitatum*, *Saprochaete capitata* or *Blastoschizomyces capitatus*, is a rare cause of fungal infection in immunocompromised patients, mainly seen in haematological malignancies. *M. capitatus* infections are extremely rare in immunocompetent patients as it is part of normal human microbial flora. We are presenting a case of peritonitis infection with *M. capitatus* without underlying malignancies.

**Methods used** Retrospective case review.

Fungal identification and susceptibility was performed at a reference lab (U. Texas Health Science, San Antonio, Texas) by phenotypic characteristics and DNA sequencing of target ITS, D1/D2 and CLSI broth dilution (M27-S4) method.

**Summary of results** 32 year old alcoholic male with liver steatosis presented with haemorrhagic necrotizing pancreatitis with peritonitis and retroperitoneum involvement. Patient failed conservative therapy and percutaneous irrigation and drainage and underwent pancreatic necrosectomy with subtotal pancreatectomy. His course was complicated with abdominal

compartment syndrome and pulmonary embolism. He underwent multiple operative procedures with decompression and abdominal wash outs, splenectomy and cholecystectomy for eosinophilic cholecystitis. He required prolonged intensive care unit admission with mechanical ventilation. His peritoneal and retroperitoneal fluid cultures grew *M. capitatus* in 2 separate samples 11 days apart. Also, he grew Vancomycin resistant *Enterococcus faecium*, *Streptococcus sanguinis* and *Klebsiella oxytoca* from the same source. He was started on a 2 week course of ceftriaxone (changed to ciprofloxacin) plus linezolid and a 12 week course of voriconazole (MIC 0.25 mcg/ml). He started to improve and eventually was discharged home with follow up in outpatient clinic, ambulating and tolerating food.

**Conclusion** To our knowledge, this is an extremely rare case of *M. capitatus* peritonitis in an otherwise immunocompetent patient who suffered from gastrointestinal leakage due to pancreatitis. He was successfully treated with combination of surgical repair and voriconazole. Speciation of fungal organisms and determining their sensitivities are important for success patient outcomes.

#### 196 CRESENDO TRANSIENT ISCHAEMIC ATTACKS DUE TO COCCIDIOIDAL MENINGITIS

C D'Assumpcao\*, A Heidari, K Sabetian, R Johnson. Kern Medical – UCLA, Bakersfield, CA

10.1136/jim-2017-000663.196

**Purpose of study** Meningitis is the most feared form of extrapulmonary coccidioidomycosis caused by *Coccidioides immitis* or *Coccidioides posadasii*. The most common presenting symptom is headache. Other symptoms include altered mental status, fever, personality changes, nausea, vomiting, meningismus, gait abnormalities and focal neurological deficits. Presented here is a case of coccidioidal meningitis that initially presented as multiple consecutive crescendo transient ischaemic attacks (TIA).

**Methods used** Retrospective case report.

**Summary of results** 64 year old Hispanic male with diagnosis of pulmonary coccidioidomycosis whose treatment was stopped by outside physician presented with two episodes of headache, left-sided weakness and right facial droop, each episode more severe than the last but resolved in five minutes. This was preceded by two weeks of daily headaches and a year of blurry vision. In the emergency department, patient had another episode of right facial droop and left-sided weakness that resolved in five minutes. CT head without contrast with subsequent cranial angiography were unremarkable. Later that evening, patient had another episode of right facial droop and left-sided weakness, followed by new onset slurring of speech, resolving in five minutes. MRI brain showed no infarcts or intracranial haemorrhage. However, there was increased peripontine enhancement, with nodular enhancement in the left peripontine area suspicious for basilar meningitis. CSF analysis showed elevated protein and CF of 1:4 consistent with coccidioidal meningitis. Serum serology revealed CF of 1:16. Patient was started on fluconazole 1000 mg daily and a dexamethasone taper. Unfortunately, one month later, patient had another episode of 'fall' at home with residual weakness and positive orthostatics. He was found to have lumbar compression fracture of L1 vertebra without radiographic evidence of osseous coccidioidomycosis.

**Conclusions** To our knowledge, this is the first reported case of crescendo TIAs as the presenting manifestation of coccidioidal meningitis.

### 197 CAPNOCYTOPHAGIA PULMONARY ABSCESS DEMONSTRATES CLINICAL RESISTANCE TO CEPHALOSPORIN

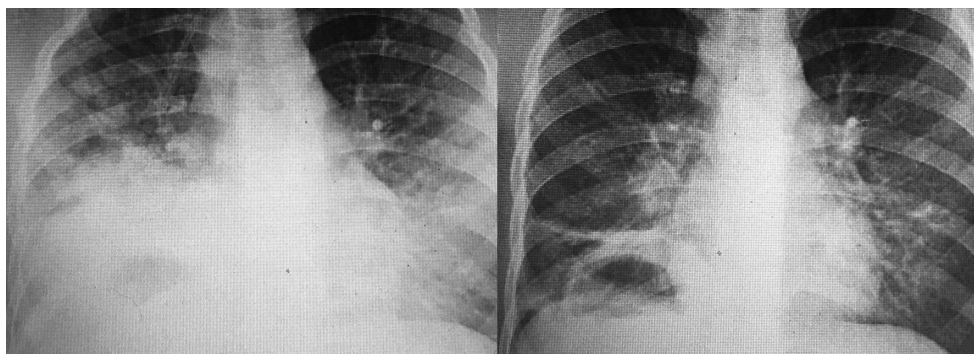
RD Fisher\*, B Wong, D Di John. *University of Nevada Las Vegas, Las Vegas, NV*

10.1136/jim-2017-000663.197

**Case report** Capnocytophagia is a known but rare cause of pulmonary infection and abscesses in children which can be encountered in both immunocompetent and immunocompromised hosts. Although traditionally thought of as a cause of sepsis from canine bite, it can also be an indolent organism which may not respond to traditional pneumonia treatment.

A 12-year-old male presented with four days of high fever and dyspnea. One month prior, he had been hospitalised with significant hypoxia and sepsis. Initially, he received two days of vancomycin, azithromycin, and ceftriaxone, and had substantial improvement, so he was transitioned to third generation cephalosporins alone. He was treated for fourteen days for lobar pneumonia with pleural effusion. He had persistent cough and dyspnea for two weeks before again becoming febrile. His chest X-ray was concerning for cavitory lesion, which was confirmed by CT Chest. He was started on clindamycin in addition to ceftriaxone. Bronchoscopy revealed purulent material and bronchoalveolar lavage sample identified predominant Capnocytophagia species. On review, the patient had shared a meal with a pet dog at a picnic two weeks prior to the initial illness. He was treated for four weeks with both antibiotics for complicated pneumonia and recovered well.

This case clinically demonstrates Capnocytophagia's increasing resistance to cephalosporins, and the need for alternative therapy. Capnocytophagia species produce unique beta-lactamases highly resistant to cephalosporins. By contrast, Capnocytophagia demonstrates sensitivity to clindamycin and azithromycin, and intermediate resistance to vancomycin. Partial treatment likely explains our patient's initial improvement, followed by repeat deterioration. Capnocytophagia should be strongly considered as a cause of necrotizing pneumonia not responding to cephalosporin therapy.



**Abstract 197 Figure 1** Initial presentation, repeat presentation

### 198 CLOSTRIDIUM SUBTERMINALE BACTEREMIA IN AN IMMUNOCOMPETENT HOST

A Karapetians, D Inderias\*, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.198

**Purpose of study** The Clostridium species are gram-positive anaerobes originating from gastrointestinal tract and can cause serious spectrum of infections usually in immunocompromised host. *Subterminale* is a subspecies of the Clostridium family that can form botulinum toxin G. This toxin has not been studied to prove its efficacy in causing harm to humans, and thus rendering the subspecies less virulent when compared to the more common *Perfringens* or *Difficile*. Other rare subspecies such as *Clostridium Innocuum* have been found to cause osteomyelitis and treated successfully with oral metronidazole for 4 weeks to 6 months in immunocompromised hosts. This case presents a patient with stage 4 decubitus ulcers with *Clostridium Subterminale* bacteremia treated with metronidazole.

**Methods used** Retrospective case report.

**Summary of results** 36-year-old immunocompetent African American male status post gunshot wound in September 2015 sustaining bilateral lower extremity paraplegia from a lesion at T9-T10 level which lead to chronic pressure ulcers of the bilateral gluteal region as well as chronic osteomyelitis of the right femur and acetabulum. He had inconsistent follow-up with wound care and was unable to obtain hospital discharge antibiotics which subsequently led to multiple admissions for septicemia. During his recent admission, blood cultures isolated *Clostridium Subterminale*, presumably from his multiple uncleaned pressure ulcers, chronic osteomyelitis, or his indwelling suprapubic catheter. The next day CT scan of the pelvis revealed destructive lesions in the acetabulum and proximal right femur as well as small collections of air in the hip suggestive of septic arthritis and osteomyelitis. The presence of air in the joint raised suspicion for the involvement of gas-forming bacteria. Once blood cultures were finalised, the isolated organism was found to be *Clostridium Subterminale* which coincided with the imaging of the right hip lesions. Patient received 6 weeks of Metronidazole orally without any further complications.

**Conclusions** *Clostridium Subterminale* is a rare cause of bacteremia and osteomyelitis in immunocompetent patients. Our patient was treated with oral metronidazole for 6 weeks without complications.



199

**BIFIDOBACTERIUM BACTEREMIA IN A 15 YO MALE WITH ULCERATIVE COLITIS**

E Jang\*, B Wong. University of Nevada Las Vegas, Las Vegas, NV

10.1136/jim-2017-000663.199

**Introduction** We report a 15 year old male with history of ulcerative colitis flare ups presenting with a rare Bifidobacterium blood culture isolate. Bifidobacterium is commonly found in probiotics and rarely causes human infections, but it has a potential for bacteremia in an immunocompromised host.

**Case description** A 15 year old male with ulcerative colitis and type 1 diabetes presented with 6–8 weeks of bloody diarrhoea. After a 6 month remission of ulcerative colitis, a prednisone wean was attempted twice, but he developed flare ups with episodes of bloody diarrhoea and concurrent URI symptoms. He reported weight loss, decreased appetite, and had elevated ESR/CRP. He was given methylprednisone, mercaptopurine, and infliximab. Colonoscopy and EGD showed intraoperative evidence of pancolitis and duodenitis with active chronic colitis on surgical pathology. Post-procedurally, he developed persistent fevers. Given the immunosuppression, he was given cefepime, azithromycin, vancomycin and metronidazole.

An extensive workup was done including blood, fungal, and streptococcal cultures which returned no growth. CT abdomen showed incidental finding of asymptomatic left lower pneumonia. Sputum cytology/culture were unremarkable. CMV, Influenza, respiratory viral panel, Cryptococcus, Aspergillus, Fungitell, legionella, mycoplasma, EBV returned negative. Stool culture were negative. However, a repeat blood culture isolated Bifidobacterium species. Patient improved clinically with broad antibiotics coverage.

**Discussion** Bifidobacterium spp is commonly found in probiotics. These anaerobic, gram-positive rods are part of the normal oral, vaginal, and intestinal flora. Probiotics have been used in inflammatory bowel disease because it protects GI by altering gut microbiota and modulating immune responses. However, Bifidobacterium can act as an opportunistic bacteria and cause bacteremia in rare cases in immunocompromised patients. A study in Norway analysed antibiotic susceptibility of these rare bifidobacterial blood culture isolates and demonstrated low MICs ( $\leq 0.5$  mg/litre) to beta-lactam antibiotics, vancomycin, and clindamycin and relatively high MICs to ciprofloxacin and metronidazole. This case illustrates the invasive potential of Bifidobacterium bacteremia in immunocompromised host.

200

**THE COCCIDIOIDOMYCOSIS CONUNDRUM: A RARE PAROTID ABSCESS**

<sup>1</sup>JJ Masehi-Lano\*, <sup>2</sup>B Nuyen, <sup>1</sup>C Tang. <sup>1</sup>Kaiser Permanente Medical Centre at San Francisco, San Marino, CA; <sup>2</sup>Stanford University Medical Centre, Palo Alto, CA

10.1136/jim-2017-000663.200

**Purpose of study** A man, age 62 years, presented to the clinic with a 2 week history of increased nontender, nonerythematous, indurated right-sided parotid swelling. A 4 × 6 cm firm, well-circumscribed mass was palpated in the right parotid gland. No pus was milked out of Stensen's duct. The patient works as an educational administrator and had a history of pulmonary coccidioidomycosis (also known as valley fever) several years ago in the past. During that time, the patient

had a complicated ICU stay and his pulmonary manifestations resolved after 18 months of fluconazole.

**Methods used** A fine-needle aspiration biopsy was performed on the parotid mass with aspiration of 0.5 cc of purulent fluid with some blood.

**Summary of results** Cultures from the aspirate revealed *Coccidioides immitis* confirmed by DNA probe. Pathology slides revealed fungal spores. MRI was performed and showed a 2 × 2 × 3 cm ill-defined fluid collection in the superficial lobe as well as associated matted lymphadenopathy extending from the parotid into levels IIb and V. The patient was treated with 800 mg of fluconazole every day, and the parotid swelling was much improved after 3 months. However, persistent cervical adenopathy remains.

**Conclusions** To our knowledge, this is the first case report of a coccidioidomycosis abscess of the parotid, diagnosis affirmed by histopathology and imaging. Although this is a rare case of acute parotid swelling, *Coccidioides immitis* should be considered in the differential diagnosis of parotid masses in a patient with previous coccidioidomycosis. There may be a potential for an increase in frequency and variety of atypical extrapulmonary manifestations of coccidioidomycosis that parallels the increase in coccidioidomycotic pulmonary infections. Long-term antifungal therapy appears essential for control.

201

**A CASE OF FAST GROWING MYCOBACTERIUM OSTEOMYELITIS SUCCESSFULLY TREATED WITH LINEZOLID**

<sup>1</sup>GV Dalben, <sup>1,2</sup>A Heidari, <sup>1</sup>ME Quinlan\*. <sup>1</sup>Kern Medical Centre, Bakersfield, CA; <sup>2</sup>UCLA, Los Angeles, CA

10.1136/jim-2017-000663.201

**Purpose of study** Nontuberculous mycobacteria (NTM) are ubiquitous, found in water and soil, and can cause serious infections. Nosocomial infections are often due to exposure of tissue to the environment. We are describing a case of rapidly growing non-tuberculous mycobacterium osteomyelitis of a complicated non-union femur fracture.

**Methods used** Retrospective chart review.

**Summary of results** This is a 38-year-old Caucasian male, admitted to our hospital for 20 × 30 cm laceration to left thigh obtained after he lost control of his all terrain vehicle, and subsequently hitting a tree. As a result of the accident, the patient sustained a penetrating wound. He was found to have a comminuted, displaced angulated fracture of his mid femur. He then underwent an intramedullary nail fixation procedure of his left femur and debridement of the open fracture. Intraoperative cultures returned positive for Enterobacter cloacae, Enterococcus faecalis, and Enterococcus faecium and were treated with ampicillin and bactrim. About a month later, he presented with infected hardware and an abscess. The patient underwent revision of his hardware and was treated with piperacillin-tazobactam for six weeks. Subsequently, he developed surgical incision dehiscence and two draining sinuses in the ventral aspect of his left thigh. Imaging was consistent with left femur non-union. He was again taken to the operating room for repair of the non-union, with an autograft from his right femur, and remained on piperacillin-tazobactam. His intraoperative culture grew gram positive organisms identified later as mycobacteria. He was then placed on linezolid empirically. The isolate was sent Quest



Diagnostics and came back as *Mycobacterium fortuitum*/*Mycobacterium farcinogenesis*/*Mycobacterium senegalense*, unable to distinguish, but susceptible to linezolid with an MIC of 8. He was continued on a twelve-week course of linezolid with complete resolution of his infection.

**Conclusions** Clinicians should be aware of non-tuberculous mycobacterium as a possible pathogen infecting organs exposed to the environment, such as osteomyelitis with hardware infection and presence of a sinus tract.

## 202 HOLES IN THE ROOF, CATS IN THE ATTIC: AN HIV PATIENT WITH SKIN LESIONS

M Rangel-Garcia\*. *Univeristy of California, Davis, Sacramento, CA*

10.1136/jim-2017-000663.202

**Case report** Cutaneous lesions in an immunocompromised patient have a broad differential diagnosis and are difficult to diagnose. In this case the history was particularly important in guiding the differential diagnosis and led to the diagnosis of bacillary angiomatosis.

A 57 year-old man with HIV was brought to the hospital for weakness. The patient had stopped engaging in conversation and become so weak he could not walk. Patient was diagnosed with HIV 6 months previously but had been non-adherent to his anti-retroviral therapy. His home had multiple holes in the roof where feral cats entered and defecated in the house. Vital signs were remarkable for fever and hypotension. There was a left pre-auricular lesion 1 centimetre in size with raised flesh-coloured borders and central ulceration. CD4 count was 34 and HIV viral load was 28 966. Differential diagnosis for this lesion was basal cell carcinoma, squamous cell carcinoma, Kaposi's sarcoma, syphilis and bacillary angiomatosis. Shave biopsy was performed and multiple stains were completed. The HHV-8 and T. pallidum stains were negative, but the Warthin-Starry stain was positive and gram negative organisms were present in the specimen. A diagnosis of bacillary angiomatosis was made and patient was subsequently discharged home with doxycycline and anti-retroviral therapy was re-started.



Abstract 202 Figure 1

Bacillary angiomatosis is a vascular proliferative disease cause by *Bartonella henselae* or *Bartonella quintana* that is mostly found in immunocompromised persons. Diagnosis is made by *Bartonella* immunofluorescence assay of serum or by skin biopsy followed by Warthin-Starry staining. In any immunocompromised patient with cutaneous lesions a broad differential diagnosis must be considered so appropriate treatment can be started promptly.

## 203 THE RARE FLAVUS OF FUNGUS AMONG US – INVASIVE PARASINUS AND CENTRAL NERVOUS SYSTEM ASPERGILLOSIS FLAVUS IN AN IMMUNOCOMPETENT PATIENT

A Sandhu\*, J Patel, R Jariwal, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.203

**Introduction** Invasive Aspergillosis is commonly seen in an immunocompromised patients. We report a case of a 35-year-old healthy female with invasive parasinus and CNS aspergillosis flavus. Of the 123 reported cases, there have been no reported cases of an immunocompetent patient and only 7 out of 123 patients with *Aspergillus flavus*, one of the rarest genotypes.

**Case presentation** A 35-year-old Indian female presents with left facial pain and swelling for 2 months, with previous history of left frontal lobe aspergillosis status post surgical debridement and Voriconazole treatment for 3 years. Physical examination was significant for a round solid mass on the left zygomatic process. A CT and MRI of the brain and maxillary sinuses showed a mass involving the right ethmoid sinus and frontal lobe, right and left maxillary sinus with adjacent bone destruction. Biopsy was performed and patient was started on Amphotericin B 5 mg/kg for 5 days. Biopsy results and sinus fluid culture were positive for *aspergillus flavus*. Patient was transitioned to oral Isavuconazole 186 mg twice daily and surgical resection of mass was performed, with indefinite continuation of Isavuconazole treatment.

**Discussion** Aspergillosis is a fungal opportunistic infection that manifests in immunocompromised patients, or in patients with co-morbidities such as diabetes mellitus and hypertension. Our patient had no co-morbid conditions. Deficiency in toll-like receptors that recognise beta-d-glucan has been credited to the masking of the host's inability to recognise this fatal infection. There have been only 7 out of 123 reported cases of *Aspergillus flavus* causing invasive disease. Imaging scans can show the degree of invasion, but biopsy remains gold standard for definitive diagnosis. Voriconazole is the predominant treatment in treating invasive aspergillosis.

**Conclusion** Invasive aspergillosis with CNS involvement is mainly seen in an immunocompromised host. However, high suspicion should be maintained when evaluating patients with recurrent fungal infections. Early initiation of antifungal therapy, surgical intervention and lifelong antifungal therapy in patients with recurrent fungal infections is the most successful approach for management of these patients.

204

# IATROGENIC CHIARI 1 MALFORMATION AS COMPLICATION OF CENTRAL NERVOUS SYSTEM COCCIDIOIDOMYCOSIS INFECTION

A Karapetians, C Spates\*, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.204

**Purpose of study** Chiari I malformations are termed when the cerebellum extends down through the foramen magnum and causes stress on the brainstem and spinal cord. These can be either primary/congenital or due to secondary causes such as increased ICP. This case presents a patient who developed a Chiari I malformation in the setting of a lumboperitoneal shunt and central nervous system (CNS) coccidioidomycosis infection.

**Methods used** Retrospective case report.

**Summary of results** This is a 30 year old obese female with disseminated coccidioidomycosis to CNS and bones. She had a lumboperitoneal (LP) shunt placed five years prior due to elevated intracranial pressures causing papilledema and optic nerve atrophy consequences of uncontrolled CNS coccidioidomycosis. She was treated with voriconazole after fluconazole failure and was seen regularly in the clinic, however, she was lost to follow-up 9 months prior to admission and stopped her medication 3 weeks prior to admission while vacationing in Arizona. She presented to an outside hospital with worsening upper back and neck pain that progressed to paresthesias in her extremities.

Her MRI brain/C-spine/shuntogram revealed new onset ventriculomegaly and hydrocephalus, cerebellar tonsillar herniation as Chiari I and T spine syringomyelia. The distal end of the LP shunt was found to be misplaced in subcutaneous adipose tissue. She was transferred to our facility and found to have sensory and motor deficits in her extremities. Voriconazole was restarted and her serum cocci serology showed a complement fixation titer of 1:32, increased from 1:8 nine months prior. On hospital day two, a ventriculoperitoneal shunt was placed and the lumboperitoneal shunt was left in place for time being. Over the next few days, patient experienced significant improvement in her symptoms, recovering all neurologic function and motor strength. Patient was discharged on hospital day four with voriconazole and outpatient follow up.

**Conclusions** Acquired Chiari 1 malformations have been readily cited in the literature with a variety of etiologies, however, this is a rare case describing an iatrogenic cause of secondary Chiari 1 malformation in the setting of active CNS coccidioidomycosis infection.

205

# A CASE OF METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS* INFECTIVE ENDOCARDITIS PRESENTING AS NEUTROPHILIC MENINGOENCEPHALITIS

A Karapetians, C Spates\*, A Heidari. *Kern Medical, Bakersfield, CA*

10.1136/jim-2017-000663.205

**Purpose of study** Infective endocarditis with staphylococcus is commonly associated with IV drug abuse or infected cardiac devices and presents with constitutional symptoms. We are describing an unusual infective endocarditis case with Methicillin Resistant *Staphylococcus Aureus* (MRSA) which started as an infected pacemaker pocket and presented as neutrophilic meningoenkephalitis.

**Methods used** Retrospective case report.

**Summary of results** 53-year-old female presented with severe lower back pain. She was febrile, tachycardic, and lethargic to the level that hindered her ability to provide a complete history. Soon after, her level of consciousness deteriorated and she developed respiratory distress leading to intubation and lumbar puncture being performed. CSF analysis showed WBC ( $470/\text{cm}^2$ ) with neutrophil predominance (94%), protein of 162, and glucose of 77 mg/dL. Chest x-ray showed pulmonary congestion and an implanted pacemaker. CT brain was negative as MRI could not be obtained due to the patient's pacemaker and hip replacement hardware. CT cervical/thoracic/lumbar spine were also negative.

Patient was started on vancomycin and ceftriaxone empirically. Blood cultures isolated MRSA which led to a transthoracic echocardiogram being performed which showed no evidence of vegetation's. Over the next two days, the patient improved on treatment and was extubated. Upon improvement and ability to obtain better history she stated that she pocket site infection over her pacemaker with purulent discharge about 2 months ago right after placement. She took her daughter's 'antibiotics'. This resolved her symptoms but mild redness on top of the pacemaker continued. Transesophageal echocardiogram done and it showed a mass on the atrial lead suspicious for vegetation. Patient was continued on vancomycin and transferred to an outside hospital for pacemaker removal. After removal, CT angiography of the brain was performed for suspected mycotic aneurysm and it was negative.

**Conclusions** This is a rare case of MRSA infective endocarditis due to an infected pacemaker presenting as neutrophilic meningoenkephalitis that rapidly responded to pacemaker removal and antibiotics.

206

# ASYMPTOMATIC CYSTIC LESION IN AN INFANT

<sup>1</sup>S Suady Barake\*, <sup>1</sup>R Winn, <sup>2</sup>R Lampe, <sup>2</sup>F Levent. <sup>1</sup>Texas Tech Health Sciences Centre, Lubbock, TX; <sup>2</sup>Texas Tech University Health Science Centre, Lubbock, TX

10.1136/jim-2017-000663.206

**Case report** *Coccidioides* is a dimorphic fungus commonly found in Central California and regions of Arizona, Nevada and Texas. Incidence been increasing in the U.S.

A 4-month-old female presented to her well-child check in January 2016. During the visit the patient had a lesion on her left 5th finger growing in size without any other associated symptoms since first noticed in November 2015. On physical exam patient had a 0.5 cm lesion on left 5th finger extending laterally around the middle phalanx. Lesion was cystic, non-tender, no erythema or drainage. Rest of examination was normal. Shave biopsy of the lesion was done. Pathology showed exudative inflamed granulation tissue with a mixed granulomatous inflammatory infiltrate. Within the tissue there were several large circular birefractile encapsulated structures consistent with spherules of coccidioidomycosis. *Coccidioides* titer was 1:32, with a normal complete blood count. Hand X-ray showed destructive changes involving the volar aspect of the middle phalanx of the fifth digit, worrisome for osteomyelitis.

Patient was started on oral fluconazole. At 3 months of treatment, the *coccidioides* antibody titer had decreased to 1:16 with clinical improvement. Unfortunately, patient was lost to follow up after 5 months of therapy.

Primary coccidioidomycosis is asymptomatic in 60% of the cases, the remaining 40% present with an acute pulmonary infection. Only 0.5% of all primary pulmonary infection disseminates. Dissemination is more common in men, African-American and Filipino ancestries; women in their third trimester of pregnancy or postpartum and occurs in all age groups. Most common sites of dissemination are skin, bones, joints and meninges.

Disseminated musculoskeletal coccidioidomycosis is a chronic destructive disease in only 20%–50%. Paediatric osteomyelitis is extremely uncommon. Fluconazole is the most commonly used antifungal, surgical debridement may be needed.

In our patient, it is unknown if she had a symptomatic respiratory clinical course or when the primary infection occurred. She was afebrile, and her lesion was non-tender. Her hand lesion was first noted by her parents at the age of 3 months, which could be the earliest case reported of disseminated disease due to Coccidioidomycosis.

## 207 AN ATYPICAL PRESENTATION OF TUBERCULOMAS IN AN IMMUNOCOMPETENT HOST

M Viehweg\*, K Galang, FC Venter, A Heidari, R Sidhu. *Kern Medical, Bakerfield, CA*

10.1136/jim-2017-000663.207

**Purpose of study** Tuberculomas are an intracranial form of tuberculosis (TB) that account for a third of intracranial lesions in endemic areas. If symptomatic, they usually present as meningitis in an immunocompromised host; however, in patients without signs of meningitis clinical features are essentially indistinguishable from any other space occupying lesion. We present a case of central nervous system tuberculosis (CNS TB) in an immunocompetent host who presented with seizures.

**Methods used** Retrospective case report.

**Summary of results** A 24-year-old Hispanic male who previously worked as a nurse in Mexico presented to our facility 4 months prior as a self-referral. He had been suffering from recurrent bilateral pleural effusion and thickening for the last 2 years without any diagnosis. During our initial work up he was found to have a positive quantiFERON TB test but had negative sputum AFB smear and culture and was discharged to follow up in our pulmonary clinic. He was lost to follow up and presented again, this time with new onset headaches

and seizures. His Brain CT revealed numerous infratentorial and supratentorial enhancing brain lesions. Physical exam was significant for bitemporal visual deficits. Lumbar puncture (LP) showed opening pressure of 370 mm H<sub>2</sub>O, CSF WBC of  $8 \times 10^3$  u/L, CSF glucose and protein were 50 mg/dL and 89 mm/dL respectively, with a 55% lymphocyte predominance. Due to suspicion for TB, he was empirically placed on four anti-TB medications and a steroid. Pleural biopsy was performed which showed caseating granulomata with negative AFB stain. Throughout hospitalisation he had 2 additional LPs to alleviate elevated intracranial pressure. Airborne isolation was cleared after 3 negative sputum AFBs and he was discharged home with the same 4 drug regimen and a steroid taper dose. His plural biopsy grew MTB complex after 6 weeks in the lab.

**Conclusions** This is a rare case of central nervous system tuberculosis with multiple tuberculomas without the typical cerebrospinal fluid picture which disseminated from an unrecognised pleural source.

## Poster session

### Neonatology – general

6:00 PM

Thursday, January 25, 2018

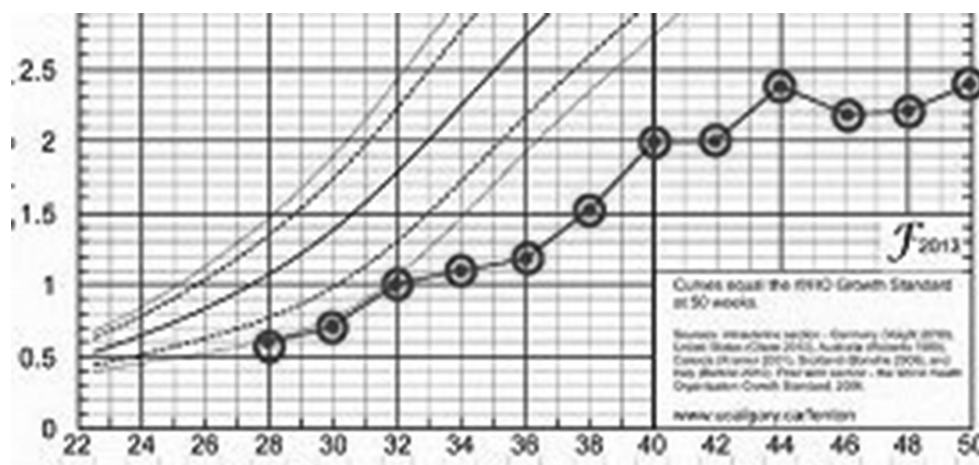
## 208 A NOVEL CASE OF BILIARY ATRESIA IN A PREMATURE NEONATE WITH 1P36 DELETION SYNDROME

<sup>1</sup>V Chawla\*, <sup>1</sup>R Alhosh, <sup>2</sup>A Eldemerdash, <sup>2</sup>D Reyes, <sup>1</sup>R Scherr, <sup>2</sup>K Ezeanolue, <sup>2</sup>F Banfro.

<sup>1</sup>University of Nevada Las Vegas, Las Vegas, NV; <sup>2</sup>University Medical Centre of Southern Nevada, Las Vegas, NV

10.1136/jim-2017-000663.208

**Case report** We describe the case of a premature male newborn with 1 p36 deletion syndrome and Biliary Atresia (BA). Patient was born at 28 weeks of gestation via caesarean section after a complicated pregnancy with advanced maternal age, gestational hypertension, and Intra uterine growth restriction. Physical examination was pertinent for low birth weight, hypotonia and dysmorphic features. Chromosomal microarray was performed due to dysmorphism and failure to thrive, and



**Abstract 208 Figure 1** Depiction of growth curve on Fenton's growth chart. X axis – gestational age, Y axis – weight in kilogram



patient was found to have 1 p36 deletion syndrome. At seven weeks of life, BA was suspected due to presence of acholic stools and elevated direct bilirubin. Abdominal imaging failed to visualise the gallbladder, and a hepatobiliary scan confirmed the absence of a biliary tree. An open liver biopsy showed extensive canalicular cholestasis, mild ductular reaction and fibrosis. Intraoperative cholangiogram showed a diminutive gallbladder and atretic common bile duct. A hepatopertoenterostomy was performed which was well tolerated. Since the first report of 1 p36 deletion syndrome in 1996, increasing number of new phenotypic abnormalities have been reported. Linking of specific anatomic and physiologic defects to gene deletions has yet to be fully achieved, leaving clinicians to rely on reports of previously identified abnormalities. To our knowledge, this is the first case of BA in a patient with 1 p36 deletion syndrome. The authors suggest considering chromosomal microarray testing in patients with suspected BA who have dysmorphic features, especially preterm neonates given their extreme vulnerability.

## Poster session

## Surgery

6:00 PM

Thursday, January 25, 2018

209

### SYSTEMATIC REVIEW OF SURGICAL RISK COMMUNICATION TO AND RETENTION BY PATIENTS

D Aasen\*, K Hammermeister, A Prochazka, R Meguid. *The University of Colorado School of Medicine, Aurora, CO*

10.1136/jim-2017-000663.209

**Purpose of study** Informed consent is an ethical and legal imperative of any surgical practice. While effectively communicating procedural risks to patients is an integral component of informed consent, no recent systematic review has established how well this is executed. The goal of this systematic review is to assess what risk information surgeons provide patients during consent, what information patients desire, and how well patients retain this risk information.

**Methods used** Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses as a guide, PubMed was systematically searched for publications on preoperative communication of risks to adult surgical patients, without date restrictions. Selected studies either provided objective evaluation of patient comprehension of risk information, examined what risk information is shared with patients in practice, or evaluated patient desires for risk information.

**Summary of results** Of 4375 studies screened on initial literature review, 72 met inclusion criteria. Twelve studies reported that patients generally desire detailed possible risk and complication information; 18 studies used clinical observation, chart analysis, and surveys, to evaluate what risk information patients are provided. Authors repeatedly reported 'inadequate and inconsistent' provision of information by providers. Forty-six studies investigating patient risk information retention found a wide variety of patient recall. For example, studies measuring recall immediately after consent had a median and

interquartile range of 48% (45%–61%). Of studies evaluating the effect of a communication support tool or technique on patient recall, just over half reported statistically significant improvement, which ranged from 6%–37%.

**Conclusions** Based on this comprehensive review, current surgical risk communication is inadequate when compared to the ethical standard of informed consent and patient desires due to wide variance in what risk information is provided to and retained by patients. This indicates that significant opportunities exist to improve consent practice. The future development of surgical communication tools and techniques should emphasise optimising and standardising risk communication specifically, leading to improved risk information delivery to and retention by patients.

210

### CLERKSHIP PROCEDURAL TECHNIQUE SIMULATION PROJECT

<sup>1,2</sup>S Butterworth, <sup>1,2</sup>GK Blair, <sup>1,2</sup>D Duffy, <sup>1,2</sup>B Fashola, <sup>1</sup>T Ji\*. <sup>1</sup>University of British Columbia, Coquitlam, BC, Canada; <sup>2</sup>BC Children's Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.210

**Purpose of study** The transition into clerkship can be difficult for medical students. They become responsible for performing procedural tasks at the appropriate standard despite having no to little experience. The aim of the project is to provide students with the opportunity to learn and practice necessary procedural tasks required for surgical rotations; this was achieved by using simulation-based educational resources during the pre-clerkship period. A secondary aim was to assess the effectiveness of the simulation-based educational resources.

**Methods used** This is a single-centred, prospective study with second-year medical students who were randomly assigned to video or paper educational resources. Students were educated on male Foley catheter insertion, nasogastric tube insertion and sterile techniques. Assessors were blinded to the students' educational resource exposure. Following the viewing, students were asked to perform each respective task. Proficiency was determined by clinical assessors using a checklist of technical tasks and global score as well as post-test surveys completed by the students.

**Summary of results** Twelve medical students were enrolled, with 6 students assigned to each group. The video group consistently performed better than the paper group using the Adapted Global Rating Scale for Assessment of Technical Skills (male Foley catheter 2.6 vs 2.0, NG tube 3.6 vs 3.5, sterile techniques 4.2 vs 3.9 for video and paper respectively). More students were rated 'ready to perform independently' from the video group than the paper group (67% vs 17% for video and paper respectively). All students agreed or strongly agreed that the resources were useful to their learning. Participants in both paper and video groups reported increased confidence in performing each task after being exposed to the educational resource.

**Conclusions** Both paper and video resources were effective in improving student ability and comfort to perform the three surgery-related tasks. Video resources were rated superior to the paper resources by students and the video group was more likely to be rated 'ready to perform independently' on the procedural tasks by assessors.



## 211 ANTERIOR CRUCIATE LIGAMENT INJURY SEVERITY AND LONG-TERM FUNCTIONAL OUTCOMES

<sup>1</sup>A Jones\*, <sup>2</sup>A Gagliardi, <sup>3</sup>JC Albright. <sup>1</sup>University of Colorado School of Medicine, Aurora, CO; <sup>2</sup>Children's Hospital Colorado, Aurora, CO

10.1136/jim-2017-000663.211

**Purpose of study** Anterior cruciate ligament (ACL) rupture is the most common injury of the internal knee in the paediatric population. While operative technique has dominated the discussion on ACL injuries, long-term functional outcomes remain universally unpredictable. The aim of this study was to investigate the prognostic value of injury severity on long-term functional outcomes.

**Methods used** A retrospective cohort study of paediatric subjects who sustained an ACL rupture between 2013 and 2015 was conducted. All subjects were treated at Children's Hospital Colorado. The severity of the injury was defined by the occurrence of concomitant injury to the knee which was extracted from the arthroscopic findings in the operative note. The types of concomitant injury (menisci, ligament, chondral, bone, and combination) were divided into subgroups for analysis. Two validated surveys, International Knee Documentation Committee (IKDC) and Lysholm Knee Questionnaire, were administered to subjects with at least two years of post-reconstruction follow-up to assess functional outcomes.

**Summary of results** Of the 52 subjects who completed both surveys, 30 had sustained at least one concomitant injury (table 1). The most common concomitant injury was unilateral or bilateral damage to the menisci (83.3%). The average IKDC score of bilateral meniscus tears was 77.8 (SD 26.9) which was lower than the non-concomitant injury group ( $p < 0.05$ ). There was no difference in Lysholm score between the concomitant injury subgroups and the non-concomitant injury group.

**Conclusions** Bilateral meniscus tears may be trending towards worse functional outcomes at least 2 years after ACL reconstruction. There is a trend towards any kind of concomitant injury having lower functional scores than non-concomitant injuries. Recruiting more subjects into the study will increase the likelihood of observing a meaningful difference.

**Abstract 211 Table 1** Subject demographics and functional outcome scores

	No Concomitant Injury	Concomitant Injury	<i>p</i>
<b>n</b>	22	30	–
<b>Age at surgery</b>	14.9 ± 2.7	15.4 ± 2.0	0.43
<b>Post-operative years</b>	2.6 ± 0.7	2.6 ± 0.8	0.92
<b>IKDC score</b>	92.6 ± 10.6	89.7 ± 16.5	0.23
<b>Lysholm score</b>	94.5 ± 10.1	92.2 ± 13.6	0.25

## 212 OUTCOMES OF BREAST RECONSTRUCTION FOLLOWING NIPPLE SPARING MASTECTOMY IN A SINGLE ACADEMIC INSTITUTION

E Magtanong\*, D Nguyen, H Kim. Loma Linda University Medical Centre, Loma Linda, CA

10.1136/jim-2017-000663.212

**Purpose of study** National trends depict a gradual increase in the rates of nipple sparing mastectomy (NSM) performed year over year. While preserving more of the native breast, NSMs have shown to be oncologically safe when following established guidelines. One potential concern of this procedure is an increased risk of complications related to ischemia of the nipple areolar complex. In our study, we sought to examine the rate of NSMs with reconstruction and patient outcomes performed at our institution.

**Methods used** Data was collected retrospectively on all patients who underwent nipple sparing mastectomies and reconstruction from July 2012 to December 2016 at Loma Linda University Medical Centre. Data collected included patient demographics, breast cancer characteristics, and major complications within 90 days post-surgery including: ischemia related complications, infections, hematomas, and explantation.

**Abstract 212 Table 1** Rates of nipple sparing mastectomy with reconstruction and major complications (requiring return to OR or hospital admission) by year

Year	Total mastectomy patients	Nipple sparing mastectomy patients	Rate of NSM %	Major complications	Complication rate %
2012	21	3	14.3	1	33.3
2013	63	20	31.7	7	35.0
2014	64	19	29.7	5	26.3
2015	61	25	41.0	7	28.0
2016	52	20	38.5	3	15.0
TOTAL	261	87	33.3	23	26.4

**Summary of results** A total of 87 patients received nipple sparing mastectomies with reconstruction. Among these patients, 155 NSMs were performed—76 therapeutic, 79 prophylactic. The mean patient age was 40.9 years and average BMI was 25.8. Of the 87 patients, 23 (26.4%) experienced a major post-surgical complication requiring a return to the OR or hospital admission. In 2012 the complication rate was 33.3% with a steady decline to 15.0% in the final year of the study.

**Conclusions** This data suggests that nipple sparing mastectomy rates have increased each year at our institution which correlates with the national trend. Of note, our institutional rate is significantly higher than rates reported in literature. Interestingly, our rate of complications has decreased over time. Further studies may be indicated to delineate if various factors have influenced the rate at our institution and if surgeon experience is related to outcomes.

## 213 ABSTRACT WITHDRAWN

## 214 TRENDS IN INCIDENCE AND LONG TERM OUTCOMES OF MYELOMENINGOCELE IN BRITISH COLUMBIA

<sup>1,2</sup>T North\*, <sup>1,2</sup>A Cheong, <sup>1,2</sup>P Steinbok, <sup>1,2</sup>J Radic. <sup>1</sup>University of British Columbia, Vancouver, BC, Canada; <sup>2</sup>BC Childrens Hospital, Vancouver, BC, Canada

10.1136/jim-2017-000663.214

**Purpose of study** Myelomeningocele is typically a disabling condition that results in neurologic, orthopaedic and urologic morbidity. The aim of this study was to examine the trends over time in both incidence and outcomes of myelomeningocele (MMC) in British Columbia.

**Methods used** A retrospective chart review was performed of all children with MMC followed in the British Columbia Children's Hospital (BCCH) spinal cord clinic between 1971 and 2016. The incidence of new MMC cases and the long term outcomes of MMC were compared between two 10 year cohorts. The first cohort comprised children born with MMC between 1971 and 1981 and the second cohort comprised children born with MMC between 1996 and 2006.

**Summary of results** A total of 309 children with MMC were followed at BCCH in the BCCH Spinal Cord Clinic between 1971 and 2016. There were 101 and 46 children with MMC identified in the two-time cohorts respectively. Between these two cohorts there was a significant difference in: MMC incidence 2.5/10,000 births vs 1.1/10,000 births ( $p=0.0002$ ), mortality 18% vs 0% ( $p=0.0009$ ), and the proportion of cases repaired in under 48 hours 56% vs 98% ( $p<0.0001$ ). For surviving children, the proportion of children attending special classes was found to be significantly different between groups 16% vs 46% ( $p=0.0002$ ), whereas all other outcome measures, including the proportion with hydrocephalus, kyphoscoliosis, Chiari II surgery, bowel and bladder continence, recreation participation, obesity and ambulation were not significantly different.

**Conclusions** In BC, the incidence of new cases of MMC has decreased between 1971 and 2016, while the probability of survival for these patients has increased. Despite continued multidisciplinary clinic follow up, long term outcomes have not significantly improved over time. Future research should focus on developing ways of reducing disability and improving quality of life for MMC patients and their families.

## 215 THE GERIATRIC CONSULT INDEX: A SURROGATE MARKER FOR 90-DAY MORTALITY

<sup>1</sup>A Palmer\*, <sup>1,2</sup>I Bentov, <sup>1,2</sup>L Taitsman, <sup>1,2</sup>M Reed, <sup>1,2</sup>B Nair. <sup>1</sup>University of Washington School of Medicine, Seattle, WA; <sup>2</sup>Harborview Medical Centre, Seattle, WA

10.1136/jim-2017-000663.215

**Purpose of study** Hip fractures are common in the elderly and associated with high mortality. The aim of this project was to determine the association between predictors of poor surgical outcomes: Charlson comorbidity score (CCS), intraoperative hypertension (IOH), and the geriatric consult index (GCI) and 90 day mortality.

**Methods used** This is a retrospective cohort study.

**Study subjects:** Participants were individuals age 65 or older, admitted with a hip fracture resulting from a low

energy mechanism, and treated surgically at Harborview Medical Centre during 2015 and 2016.

**Covariates:** The variables examined were CCS, IOH for which thresholds were systolic pressure below 90 mmHg or 110 mmHg, or any drop below 25% of the baseline systolic pressure, and GCI which was calculated from thirty dichotomous variables selected from the geriatric consult and ranged from 0 to 1.

**Outcomes:** The main outcome is 90 day mortality.

**Statistics:** Data was first visualised as a histogram to determine distribution. Non-normally distributed data was transformed. Association was then determined using independent student t-test with a  $p<0.05$  for CCS, IOH, and GCI and 90-mortality.

**Summary of results** 108 patients were included in the study. The average age was 77.3 years (IQR=14.0) with 59.3% female. The mean difference in CCS of those surviving 90 days post-discharge and those who did not was 0.477 (95% CI: -0.487 to 1.44,  $p=0.329$ ) with those surviving having a mean score of 1.81 ( $\pm 1.76$ , 95% CI: 1.45 to 2.17) whereas those who did not was 2.29 ( $\pm 1.14$ , 95% CI: 1.69 to 2.89).

No difference in IOH between those who survived and those who did not was found for any of three thresholds: systolic below 90 mmHg ( $-0.839\pm 1.46$ , 95% CI: -3.73 to 2.05,  $p=0.566$ ) or 110 mmHg ( $-2.43\pm 2.10$ , 95% CI: -7.20 to 2.34,  $p=0.314$ ), or any drop below 25% of the baseline systolic ( $-0.572\pm 1.63$ , 95% CI: -7.29 to 4.03,  $p=0.569$ ).

The mean difference in GCI of those of those surviving and those who did not was 0.177 (95% CI: 0.0799 to 0.273,  $p<0.001$ ) with those surviving having a mean of 0.281 ( $\pm 0.174$ , 95% CI: 0.246 to 0.316) whereas those who did not was 0.457 ( $\pm 0.137$ , 95% CI: 0.385 to 0.529).

**Conclusions** Increases in CCS and IOH were not associated with increases in 90 day mortality. However, those who survived pasted 90 days showed a decrease in GCI.

## 216 SINGLE LOWER BORDER PLATE FIXATION IN ANTERIOR MANDIBULAR FRACTURES

TT Park\*, K Lopez, D Nguyen, M Martin. Loma Linda University School of Medicine, Loma Linda, CA

10.1136/jim-2017-000663.216

**Purpose of study** Repair of symphyseal and parasymphyseal mandibular fractures is traditionally performed with a lower border plate and either an upper border microplate or arch bars as a tension band. Complications of microplates include wound dehiscence, plate exposure, and tooth root injury. Issues with arch bars include increased operative time, a second procedure for removal, risk of TMJ ankylosis, and risk of injury to the operative team. We propose that one lower border plate is adequate for simple fractures of the anterior mandible and will serve to minimise complications.

**Methods used** A retrospective review was conducted of all records of patients that underwent open reduction and internal fixation of symphyseal and/or parasymphyseal fractures of the mandible in a level I trauma centre from 2012 to 2017. Criteria for inclusion included reconstruction with a single 2.0 mm lower border plate; criteria for exclusion included fixation by any other method. Thirty patients fit the inclusion criteria. Demographic information, comorbidities, and details

pertaining to the injury and operation were collected. The length of follow up and any complications were also noted.

**Summary of results** A total of 30 patients underwent parasymphseal or symphyseal mandibular fracture repair with a single lower border plate. Ages ranged from 6 to 54 years. Twenty-two out of 30 (73%) patients were male and 8 (27%) were female. Preoperative trauma-related morbidities included 2 cases of tooth loss (7%), 27 cases of gross malocclusion (90%), 6 cases of paresthesia (20%), and 1 case of facial palsy (3%). Twenty-six patients (87%) had concurrent fractures that were also repaired. Twenty-nine patients obtained a postoperative maxillofacial CT scan (97%). The average length of follow up was 103 days (range 1–431). No patients had post-op malocclusion, infections, hematomas, or iatrogenic tooth injury.

**Conclusions** Results of our study suggest that single lower border plating is an effective method of repair for simple anterior mandibular fractures. Upper border plates as advocated classically are not necessary. Furthermore, we feel the absence of an upper border plate is key to the lack of exposures and wound dehiscence in our patients. It may be useful to conduct a prospective comparative analysis of these techniques in the future.

## 217 EFFICACY OF TYMPANOSTOMY TUBE INSERTION IN ADULT EUSTACHIAN TUBE DYSFUNCTION

L Peraza\*, L Evans, A Zamboni. *University of Nevada, Reno School of Medicine, Reno, NV*

10.1136/jim-2017-000663.217

**Purpose of study** To evaluate symptom improvement and patient satisfaction after tympanostomy tube placement, with possible tube removal, in adults with ETD who have previously failed medical treatment.

**Methods used** Retrospective chart review using the electronic medical record at Nevada ENT clinic. Inclusion criteria entailed: diagnosis with ETD, over 18 years old, previously failed medical treatment, and tympanostomy tube insertion in office between June 16th, 2014 and September 6th, 2017. The tympanostomy tube insertion procedure entails administration of a local anaesthetic followed by myringotomy and subsequent Richard's modified T-tube insertion into the tympanic membrane; it usually takes 5–10 min in office, under otolaryngology microscope magnification.

**Summary of results** 78 of 101 patients (136 of 178 ears) reported overall ETD symptom improvement after receiving tympanostomy tubes. Patients commonly reported improvement in ear pressure, hearing, otalgia, and dizziness. 60 patients elected to keep the tubes in, as these patients reported symptom improvement for the reasons above, and were satisfied with their results. 25 patients had a tympanostomy tube removed due to preference: 19 patients disliked hearing changes, a 'hollow' sensation, or were unable to tolerate expected otorrhea, and 6 patients felt their ETD symptoms had been cured, wishing to attempt a trial without tubes.

**Conclusions** The majority of patients reported symptomatic improvement with the insertion of tympanostomy tubes, following failed medical treatment for ETD. After receiving tympanostomy tubes, patients were either cured of ETD, dependent on life-long tubes, or were not satisfied with the tubes. Though these patient reports of symptomatic improvement remain subjective, this information is vital to determine the efficacy of this elective procedure.

## 218 INNOVATIVE USES OF REAL-TIME INTRAOPERATIVE 3D IMAGING

M Plantak\*. *Loma Linda University, Loma Linda, CA*

10.1136/jim-2017-000663.218

**Purpose of study** In the past few years, cheaper and more accessible forms of portable 3D sensors have become available on the market, such as the Structure Sensor. While the effectiveness of larger scale scanners has been analysed pre and post operatively in the field of plastic surgery, there is essentially no literature on the use of newer and smaller portable sensors. These types of scanners have the potential to be used in the operating room and clinic more effectively due to their ease of use, portability, and low cost. By scanning and analysing volumetric depth in skin cancer defects, as well as larger scale tumours and fat grafts, we were hoping to see if 3D imaging could aid plastic surgeons in the reconstructive planning process during surgery and provide better clinical outcomes for patients.

**Methods used** Before reconstruction of MOHS defects and large scale tumours we obtained 2D measurements of the defect (length and width), a 3D scan (volume depth), the type of procedure done (primary closure, skin graft, or type of flap) and the deepest structures exposed. 3D scans for facial fat grafts and breast fat grafts were also obtained intraoperatively to assess facial contour and volume of fat injection during the procedure.

**Summary of results** The benefits of portable 3D imaging to assess wound defects in MOHS patients and large scale tumours was insignificant. The scanner was unable to provide accurate measurements for shallow defects and depth measurements could just as easily be made with a sterile ruler during operation. For large scale tumours, the scanner provided nice detail, but not any useful intraoperative measurements to aid the surgery. However, intraoperative use during facial fat graft procedures showed great potential. During subjective analysis of the 3D scans intraoperatively the surgeon was able to assess asymmetry of the fat graft only noticeable with the 3D scan and it was decided that adjustments would have to be made based on that information.

**Conclusions** Overall, the cost effectiveness and simple use of the portable 3D scanner intraoperatively shows great potential in reconstructive operations that heavily rely on changes in volume, such as facial fat grafts. In the future, more scans of facial fat grafts and other volume dependent reconstructions should be obtained and evaluated pre-operatively, intraoperatively, and post-operatively to more accurately assess use.

## 219 OPTIMAL REOPERATIVE TIME FRAME FOR SECONDARY HAND SURGERY

M Plantak\*. *Loma Linda University, Loma Linda, CA*

10.1136/jim-2017-000663.219

**Purpose of study** While literature on primary hand surgery has progressed significantly over the past few decades, barely anything has been written about secondary hand surgery over the last 40–50 years. Generally, there has been a move towards more primary surgery over the past few decades due to the fact that immediate repairs avoid the formation of extensive scarring and contracture development and measures can be

taken to ensure that primary surgery more often leads to less secondary surgery. However, about 10%–25% of patients need secondary surgeries to address complications of primary repair. The timing of secondary hand surgery has a considerable effect on the result. Swollen, hard and red fingers from primary surgery are not suitable for immediate secondary surgery. While it is tempting for patients to operate as soon as possible, the swelling and stiffness must be lost to maximise successful secondary surgery. This can take 3, 6, or more months, but the most beneficial time frame is not certain. Most surgeons will not intervene until 3 months after repair and some recommend at least 6 months before reoperating.

**Methods used** A retrospective study was done with 46 patients who underwent tenolysis and capsulotomy secondary hand surgeries between July 2012 and July 2017 at Loma Linda University. The time interval between primary hand surgery and secondary hand surgery was identified and the time frame for surgeries with complications was compared with the time frame of surgeries lacking complications.

**Summary of results** Results showed that the mean time interval for uncomplicated secondary hand surgeries was 6.1 months (n=30) compared to 7.1 months (n=2) for complicated secondary hand surgeries. 94% of surgeries with an average 6 month time frame between primary and secondary surgery had no complications.

**Conclusions** Although there appears to be some difference between the time interval for uncomplicated vs complicated secondary hand surgeries, a larger comparative sample size is needed. Additionally, it appears that the 6 month time frame suggested by many hand surgeons has a fairly low complication rate of 6%. However, further prospective studies need to be done with a greater sample size in order to determine if there is an ideal time frame for uncomplicated secondary hand surgeries.

220

#### COMPARISON OF ROTATIONAL AND CLINICAL OUTCOMES IN FEMORAL DEROTATION OSTEOTOMIES BETWEEN BLADE PLATE AND INTRAMEDULLARY NAIL FIXATION

CD Sauer\*, JJ Carollo, JT Rhodes. *University of Colorado School of Medicine, Aurora, CO*

10.1136/jim-2017-000663.220

**Purpose of study** Femoral derotational osteotomies (FDROs) are an orthopaedic intervention to correct femoral anteversion and improve biomechanical function. Blade plates (BP) and trochanteric intramedullary nails (IMN) are two fixation techniques compared in this study. The goal of this study is to test equivalence between the two fixation methods regarding accuracy of rotational correction and clinical metrics.

**Methods used** After IRB approval, retrospective gait analysis data were collected on 89 subjects receiving FDROs, including pre- and post-operative measurements of hip internal/external rotation, average pelvic/hip rotation, medical diagnoses, fixation, and concurrent surgeries. Hip internal and external rotation were averaged to estimate femoral anteversion. Pelvic and hip rotations were calculated as averages over complete gait cycles using 3D kinematics. To test rotation accuracy, subjects diagnosed with cerebral palsy (n=29) were separated into groups receiving IMN and BP fixation. Changes in hip kinematics and internal/external hip rotation were compared pre- and post-operatively using Student's t test. To account for

single event multilevel surgeries while investigating differences in clinical and surgical metrics, BP and IMN subjects were optimally matched (n=26) using MatchIt R statistical package and compared using Fisher's exact test.

**Summary of results** The IMN and BP groups had no statistically significant differences except for time to weight bear, which was 11.9 days sooner for individuals that received IMNs when compared to BPs. Note that values for each measurement were subtracted between BP and IMN groups, where positive represents BP>IMN.

**Conclusions** There were no significant differences between BP and IMN groups regarding rotational outcomes of the FDROs. The clinical metrics between the two fixation methods were nearly identical as well except for time to weight bear. This study suggests use of IMN for isolated FDROs to treat femoral anteversion because IMNs have shorter times to weight bear while being equivalent to BPs in all other variables investigated in this study.

**Abstract 220 Table 1** Pertinent rotational and clinical outcomes

Measurement	BP vs IMN	P-value ( $\alpha=0.05$ )
Difference in Hip Int/Ext Rotation	0.7°	0.9181
Difference in Hip Kinematics	6.8°	0.3982
Time to Weight Bear	11.9 days	0.0311

221

#### OLIGURIA IN PAEDIATRIC SPINAL INSTRUMENTATION SURGERY: IS IT ACUTE KIDNEY INJURY (AKI)?

<sup>1</sup>JN Tang\*, <sup>1</sup>A De Mello, <sup>2</sup>T Teo, <sup>2</sup>C Reilly, <sup>3</sup>A Morrison, <sup>2</sup>K Mulpuri, <sup>1</sup>C Mammen. <sup>1</sup>*Division of Nephrology, BC Children's Hospital, Vancouver, BC, Canada;* <sup>2</sup>*Division of Orthopaedics, BC Children's Hospital, Vancouver, BC, Canada;* <sup>3</sup>*Division of Anaesthesiology, BC Children's Hospital, Vancouver, BC, Canada*

10.1136/jim-2017-000663.221

**Purpose of study** A recent retrospective study found that 20% of paediatric spinal surgery patients had post-operative oliguria, suspected to be related to AKI. We aimed to determine if oliguria in this population is related to AKI by comparing urine biomarker neutrophil gelatinase-associated lipocalin (NGAL) concentrations in patients with and without post-operative oliguria.

**Methods used** This is an ongoing single centre prospective cohort study. To date, we have enrolled 19 children (mean age 14.1 years, SD 3.2 years; 8 males) undergoing spinal surgery for non-idiopathic scoliosis repair from Jul 2016-Aug 2017. Hourly urine output (U/O) was recorded until post-op day (POD) 3. Stage 1 and 2 oliguria were defined as <0.5 cc/kg/hr for at least 6 hours and 12 hours respectively using KDIGO (Kidney Disease: Improving Global Outcomes) U/O AKI criteria. Urine NGAL, corrected for urine creatinine, was collected at 4 time points: pre-op, 3 hours intra-op, surgery end, and 24 hours post-surgery start time. The association of urine NGAL and oliguria was determined using Area under the Receiver Operating Characteristic curve (AUC).

**Summary of results** 14/19 patients (74%) met oliguria criteria (n=7 Stage 1, n=7 Stage 2). No patients met serum creatinine criteria for AKI. Urine NGAL concentrations did not show an appreciable rise at any time point. Creatinine-corrected urine NGAL was poorly associated with oliguria at all time points (AUC range 0.44–0.67). Mean cumulative fluid balance peaked



on POD 2 for non-oliguric patients (+2.6 L, SD 1.2 L) and peaked on POD 3 for oliguric patients (+3.4 L, SD 2.7 L). Mean cumulative fluid balance by POD 3 was higher for oliguric patients (+3.4 L, SD 2.7 L) than for non-oliguric patients (+2.3 L, SD 1.7 L), but was not statistically significant ( $p=0.475$ ).

**Conclusions** Preliminary biomarker results suggest that post-op oliguria in spinal surgery patients may occur due to reasons other than AKI. Regardless of the cause of oliguria, strategies for improved fluid management post-op should be implemented to prevent fluid overload and its associated complications for these patients.

222

# EMERGENCY DEPARTMENT AND UNPLANNED READMISSIONS POST DISCHARGE FOR TYPE B AORTIC DISSECTIONS

<sup>1</sup>VK Wu\*, <sup>1</sup>M Bartek, <sup>1</sup>S Shalhub, <sup>2</sup>M Zadworny. <sup>1</sup>University of Washington School of Medicine, Seattle, WA; <sup>2</sup>SORCE, Seattle, WA

10.1136/jim-2017-000663.222

**Purpose of study** As of 2009, 20% of Medicare beneficiaries discharged from a hospital return within 30 days; unplanned readmissions cost Medicare \$17.4 billion per year. Reasons for unplanned presentation after hospital discharge from acute Type B aortic dissections (TBAD) are not well studied. This study aims to describe reasons for emergency department (ED) visits and unplanned hospital readmission after discharge for patients with acute TBAD at a single healthcare system.

**Methods used** This is a retrospective review of patients with TBAD who presented to a single healthcare system between 1993–2013. Patients were included if they admitted within 14 days of symptom onset, were managed medically and survived to discharge. Data collected include demographics, hospital length of stay, and discharge disposition. 30 day follow up data include outpatient visits, ED visits, and hospital readmissions.

**Summary of results** In the study period, 109 patients met inclusion criteria (mean age  $62.5 \pm 12.8$ , 60.9% male, 70% Caucasian). 82.7% of patients had hypertension on admission. Hospital length of stay was  $10.6 \pm 9.3$  days. Unplanned 30 day hospital readmission occurred in 18 (16.5% of cases) and 36 (33%) had an unplanned presentation within one year of discharge. The median time to unplanned presentation was 19 days post discharge (range 6–364 days). Whether or not 30 day follow up visits were kept did not affect likelihood of being readmitted within 30 days post discharge. Patients with unplanned presentation were more likely to be male (77.8% vs 53.4%,  $p=0.01$ ) when compared to the remainder of the cohort. There were no differences in age at TBAD, initial blood pressure, or hospital length of stay. The most common

causes for unplanned presentation were recurrent pain (69.4%) and uncontrolled hypertension (25%).

**Conclusions** Recurrent pain and hypertension were the two primary reasons for ED visits and/or unplanned readmission post discharge from medically managed acute TBAD. Other than being predominantly male, dominant characteristics among these patients compared to the rest of the cohort could not be ascertained. Additional characterisation of hypertension control during the acute phase may offer additional insight to risk stratify acute TBAD patients at high risk for unplanned presentation post discharge.

223

# COMPARING WHAT CLINICIANS BELIEVE WITH ACTUAL PATIENT EXPERIENCES: A CROWDSOURCING STUDY ON HIDRADENITIS SUPPURATIVA

J Yoo\*, I Campwala, S Gupta. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.223

**Purpose of study** Hidradenitis suppurativa (HS) is a chronic skin condition that affects 1%–4% of the US. As this is a rare disease, healthcare professionals may not fully understand the personal patient experience with HS.

Online patient forums are beneficial to experience diseases from a patient perspective. The purpose of this study is to examine the discrepancies between the expected main concerns of HS patients and their actual experience.

**Methods used** Crowdsourcing platforms that were visited frequently by 12 000 cumulative members were studied. 201 responses of self-reported health data were collected from 2013–2017. In addition, a survey was completed by 11 Plastic Surgeons at a single institution.

Abstract 223 Table 1 Top 15 concerns of patients with HS

Patient Concerns	(%) of HS Patients with this Concern	Expected (%) of HS Patients with this Concern
Pain	44	13
Depression or Depression-Like Symptoms	20	8
Frustration with Healthcare Professionals	11	5
Discharge from Abscesses	7	10
Non-Healing Abscesses	8	9
Undesired Skin Changes	7	5
Unappealing Scars	7	5
Sexual or Relationship Insecurities	6	6
General Body Odor	6	8
Itchiness	4	6
General Tiredness	4	4
Surgical or Procedural Morbidities	3	7
Side-Effects from Antibiotics	2	2
Stress and/or Anxiety	2	8
General Shock/Confusion	1	3

Abstract 223 Table 2 Top 5 concerns of HS patients: actual vs expected

Top 5 Concerns:	Expected Top 5 Concerns:
1. Pain	1. Pain
2. Depression or Depression-Like Symptoms	2. Discharge from Abscesses
3. Frustration with Healthcare Professionals	3. Non-Healing Abscesses
4. Non-Healing Abscesses & Discharge from Abscesses	4. General Body Odor
5. Undesired Skin Changes	5. Depression or Depression-Like Symptoms

**Summary of results** Although there was a general consensus concerning pain, there were some notable differences. Although clinicians believed that only 8% of HS patients had symptoms of depression, more than twice that percentage of patients mentioned these concerns. Also, the 3rd most common complaint was frustration with healthcare professionals, but this was expected to be 11th out of 15.

**Conclusions** HS is a difficult disease to treat. Clinicians may need to be more aware of HS patient's symptoms of depression and their difficulties navigating through the healthcare system. With these potential improvements in HS patient care, online patient forums are shown to be a valuable tool.

## Adolescent medicine and general paediatrics II

### Concurrent session

Friday, January 26, 2018

8:00 AM – 10:00 AM

#### 224 PIERCING REMAINS A SIGNIFICANT RISK FACTOR FOR NICKEL CONTACT DERMATITIS; PRELIMINARY RESULTS FROM AN ONLINE SURVEY

<sup>1</sup>LA Ivey\*, <sup>1</sup>J Chen, <sup>1</sup>CW Rundle, <sup>1</sup>B Limone, <sup>1,2</sup>S Jacob. <sup>1</sup>Loma Linda University School of Medicine, Oceanside, CA; <sup>2</sup>Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.224

**Purpose of study** Survey prevalence and demographics of piercings and self-reported nickel sensitivity in the United States.

**Methods used** The Nickel Contact Dermatitis Survey is a self-reporting, online questionnaire developed to gather information regarding the prevalence of nickel allergic dermatitis. Social media outlets such as Facebook, Twitter, Instagram, Reddit, and YouTube were utilised to broadcast an online version of the survey. Additionally, a paper version was distributed at local universities.

**Summary of results** Between Jun 1- September 25, 462 respondents in the United States were indexed. A chi-squared test comparing pierced individuals (n=319) and those with a self-reported nickel sensitivity (n=198) reveals a statistically significant correlation (X-squared=70.49, df=1, p-value<2.2e-16), consistent with previous research in this area. Additional statistical analysis reveals attributable risk of 44% for piercing and nickel sensitivity.

**Conclusions** The strong association between piercing and nickel sensitisation underscores the importance that health care practitioners and the public understand that piercing remains a risk factor for lifelong nickel sensitivity.

#### 225 MOTIVATIONAL INTERVIEWING TO TREAT OVERWEIGHT AND OBESE ADOLESCENTS: A SYSTEMATIC REVIEW

<sup>1</sup>A Mirabal\*, <sup>1</sup>M Vallabhan, <sup>1</sup>EY Jimenez, <sup>1</sup>J Nash, <sup>2</sup>S Feldstein Ewing, <sup>1</sup>A Kong. <sup>1</sup>UNM, Albuquerque, NM; <sup>2</sup>OHSU, Portland, OR

10.1136/jim-2017-000663.225

**Purpose of study** Adolescent obesity is a worldwide epidemic with long term health risks, but successful treatment remains

challenging. Motivational interviewing (MI), an interventional approach designed to enhance behaviour change, shows promise in the context of healthy lifestyle changes among adults. Since the last published systematic review (SR) in 2014, 9 additional MI intervention studies targeting overweight and obesity in adolescents have been published. The goal of this SR is to update the evidence to assess the effects of MI for treating overweight and obesity in adolescents.

**Methods used** We developed and published a protocol (#CRD42017072342) using Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA), which describes the methodology. We used standard procedures outlined by the Cochrane Handbook for Systematic Reviews. We performed analysis for each outcome using a fixed effect model; if  $I^2$  was greater than 50%, we used a random effect model. We produced overall effect estimates and mean difference (MD) with 95% confidence intervals (CI) for each outcome. We used optimal information size (OIS) with 0.80 power to assess necessary sample size for significant MD.

**Summary of results** We included 10 RCTs with 1091 participants, duration of 3 to 12 months, 1 to 16 sessions, and sample sizes of 21 to 336. There was high risk of bias due to overall lack of blinding and low to moderate quality of evidence. We found a positive effect in favour of MI in triglycerides mmol/L (MD -0.18; CI -0.36, 0.00), non-significant positive effects on body mass index (BMI) (MD -0.47; CI -1.28, 0.33), BMI%-ile (MD -1.07; CI -3.63, 1.48), BMI z-score (MD -0.04; CI -0.20, 0.13), and fasting insulin pmol/L (MD -5.43; CI -29.16, 18.29), and no effect on waist circumference, glucose, or cholesterol. The OIS necessary for detecting a statistically significant MD was not met for any outcome. Qualitative synthesis suggests MI may improve quality of life and health related behaviours, especially when added to an additional intervention.

**Conclusions** MI alone does not seem to be effective for treating overweight and obesity in adolescents. Results should be interpreted with caution due to overall small sample sizes. Larger studies of longer duration may be needed to assess use of MI to treat adolescent obesity.

#### 226 DOES THE PRIMARY LANGUAGE SPOKEN IN THE HOME AFFECT IF GUARDIANS DISCUSS INGREDIENTS/FOOD LABELS WITH THEIR CHILD?

E Williams\*, AJ Smith, E Pak, CM Abreu, NM Malika, E Medina, M Baum. Loma Linda University, Loma Linda, CA

10.1136/jim-2017-000663.226

**Purpose of study** Roughly 41% of the population within San Bernardino county speaks a language other than English at home. Although research suggests that reading food labels can lead to positive dietary choices, current FDA food labelling regulations only require bilingual food labelling if the food item is intended to gain the attention of a person who does not speak English. Thus, most food items sold in U.S. stores are solely in English. This study evaluates if the primary language spoken in the home affects whether guardians discuss food labels with their child.

**Methods used** Children ages 9–15 years old were referred from paediatric clinics in San Bernardino county. The children participated in Operation Fit, a day camp aimed at exposing kids at risk for or struggling with unhealthy weight