Adolescent Medicine and General Pediatrics I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

1 PREDICTING HEIGHT IN A PEDIATRIC INTENSIVE CARE UNIT USING ULNAR LENGTH

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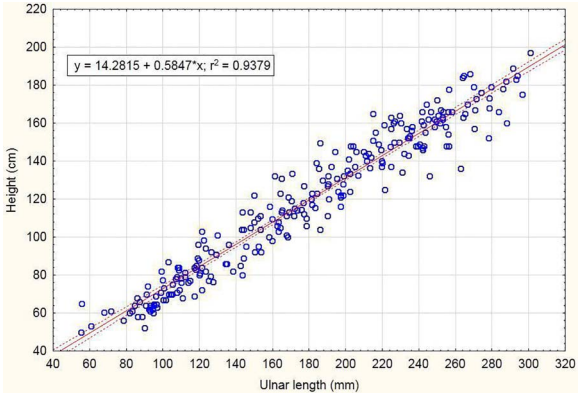
Purpose of Study Height is necessary to calculate body mass index (BMI) and body surface area (BSA). Height, BMI, and BSA are used in the pediatric intensive care unit (PICU) to assess renal and pulmonary function. BMI defines obesity which has been associated with poor outcomes in critically ill children. Unfortunately, height is not always measured in the PICU. Ulnar length has been shown to be a good surrogate for height. In prior studies in adults or well children measurements were obtained by trained research personnel. We aim to determine if ulnar length obtained by bedside nurses can estimate height in a PICU setting, and if so, to develop a formula which can be practically applied upon patient admission.
Methods Used Multidisciplinary PICU in a university hospital. Upon subject admission the nurses obtained height and weight in their typical fashion. Ulnar length was measured with digital calipers. Institutional IRB approval to obtain data with waiver of consent.
Summary of Results Over 100 nurses measured 1204 subjects (44% girls, 66% boys) with a mean age of 5.6 years (range, 1 mo to 23 yr). Prediction equations for height were developed using linear regression; height(cm)=0.58*ulnar length(mm)+14.2.
Conclusions We feel ulnar length can be used to predict height in a PICU setting with minimal staff training. The robust nature of the measurement makes this an unconventional but reasonable alternative to obtaining height when that cannot be measured directly in circumstances such as scoliosis and flexion contractures.



Abstract 1 Figure 1 Relationship between height and ulnar length for all subjects; linear regression equation with 95% confidence interval.

2 MODALITY OF TREATMENT OF PATIENTS WITH DIARRHEAL HUS IN ACUTE RENAL FAILURE DOES NOT AFFECT LONG TERM OUTCOME AND SURVIVAL IN PEDIATRIC PATIENTS

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Purpose of Study Diarrheal HUS is a disease process usually resulting from infection by *E. coli* H7:0157 and leading to the development of microangiopathic hemolytic anemia, thrombocytopenia, and acute renal failure. Acute renal failure typically follows in five days from presentation, with about two-third of the patients requiring renal replacement therapy. Studies have demonstrated that these patients are at risk for long term renal insufficiency and end-stage renal disease. Indications to start dialysis and the mode of dialysis vary from institution to institution. There is no current study comparing which mode of dialysis, hemodialysis or peritoneal dialysis, has greater benefit and less complications. The aim of this study is to compare dialysis modalities and determine whether one modality will result in less complications and better outcomes.
Methods Used This is single center, retrospective review. We studied a total of 102 patients from 1999 to 2014. We compared patients with dHUS started on PD or HD. We compared the number of complications and the types of complications from each modality. Long term outcomes were measured by each patient's CKD staging at least one year after diagnosis. EGFR was calculated using the Schwartz formula. Fisher's exact statistical test was used to assess statistical significance.
Summary of Results No statistical significance was found between the modality of dialysis and associated complications (p=0.4). There was also no statistical significance between modality of dialysis and long term outcome (p=0.9). Complications of PD were catheter malfunction (n=6), peritonitis (n=5), and the need to switch to HD or CVVHDF (n=3). Complications of HD included central line infections (n=1).
Conclusions PD and HD are equally effective in treating patients with dHUS in renal failure and have comparable long term outcome and risks for complications. An important complication to consider for patients on PD is the potential need to switch to HD or CVVHDF; this exposes the patient to an additional surgical procedure that may result in further complications.

3 AN UNUSUAL PRESENTATION OF A HIGHLY MALIGNANT TUMOR

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10.1136/jim-d-15-00013.3

Case Report A 7-year old male with past history of cerebral palsy and hypothyroidism presented with history of throat pain for 1 week. About 2 months prior to admission, the patient had complained of difficulty of breathing and increased snoring for which he was admitted to a pediatric ward of a nearby hospital. He was treated with

antibiotics for his enlarged tonsils and discharged home with a BiPAP device after the diagnostic work up failed to reveal any other cause for the difficulty breathing. Since his complaints continued to worsen 1 week prior to admission, he was referred to an ENT surgeon, who identified an oropharyngeal mass by flexible nasal endoscopy and sent to our ER for further work up.

On physical examination, he had effacement of his oropharynx on the right side with some anterior and medial displacement of the tonsillar pillars on the right side, along with slight uvular deviation to the left. No drooling was observed. He also had a diffuse firm swelling about 5×5 cm in size over the upper one-third of the right sternocleidomastoid that was not attached to the muscle and was non-fluctuant. The physical exam was otherwise benign, except for his global hypertonia and muscle wasting associated with cerebral palsy.

An MRI of the neck showed a solid 5×2.2×9 cm lesion involving nasopharynx, choana, right retropharyngeal and parapharyngeal soft tissues, with extension to right posterior triangle of neck, inferiorly along the right carotid space and superiorly to the base of skull. No intracranial spread was noted. Nuclear whole body bone scan, CT chest, abdomen, pelvis and brain were performed and unable to visualize any metastatic lesions or abnormal lymph nodes. The oropharyngeal mass was biopsied and histological studies diagnosed the mass as a Burkitt's lymphoma and patient was started on chemotherapy (COPADM regimen). He responded very well to the chemotherapy, and there was a reduction in size of his neck swelling by more than half within 3 days of initiation of chemotherapy. His stridor also resolved quickly after the start of chemotherapy.

This interesting case of a highly malignant tumor is being reported to create awareness amongst physicians about this rare mode of presentation. Through this case report we want to increase the awareness of Burkitt's lymphoma and its varied presentations.

4 COMPARISON OF HEAD CT USAGE BY PEDIATRIC EMERGENCY MEDICINE PROVIDERS IN CHILDREN WITH HEAD INJURY BEFORE AND AFTER PECARN GUIDELINES

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10.1136/jim-d-15-00013.4

Purpose of Study The goal of this study was to examine the effectiveness of the PECARN guidelines in reducing head CT usage by physicians in our department. Adherence to the guidelines was also assessed.

Methods Used We performed a retrospective chart review of patients with head injury in the pediatric emergency department (PED). Charts were reviewed in 2009 (pre-guidelines) and 2013 (post-guidelines) to record if a head CT was obtained. The data was separated by age younger than 2 and 2–17yo in concordance with the PECARN guidelines. For the 2013 charts, we determined if a CT was recommended by the guidelines. The level of training of the physician was also noted. Data was analyzed using Chi-square tests. The frequency of head CTs obtained in each age group based on level of training of the physician was compared, and the adherence rates were evaluated.

Summary of Results Total CTs obtained decreased from 52.5% to 41.3% (p=0.001). Total CTs obtained by mid-level providers (MLP) and by emergency-trained physicians (PEM) decreased from 66.7% to 50.2% (p=0.002) and 50.2% to 42.1% (p=0.04), respectively. Total CTs obtained in 2–17yo decreased from 52.7% to 39% (p=0.0004). CTs obtained in 2–17yo by MLP and PEM decreased from 63.8% to 35.5% (p=0.003) and 51.2% to 40.5% (p=0.01), respectively. Significant CT findings in 2–17yo by both providers increased from 5.9% to 13.5% (p=0.02). CT findings by PEM across all ages increased from 6.6% to 15.6% (p=0.01) and increased from 5.8% to 15.4% (p=0.01) in the 2–17yo age group. Adherence to the guidelines ranged from 93.6–100% when CT was recommended and 85.7–91.4% when CT was not recommended.

Conclusions Since PECARN guidelines were implemented in our PED, the rate of total head CTs obtained significantly decreased by both providers. When broken down into age group, results are only significant in the 2–17yo age group. There was an increase in findings in this age group, however this is only significant in the PEM provider group. Our data suggests that the PECARN guidelines proved most useful in guiding PEM providers with patients aged 2–17 years.

5 A RETROSPECTIVE DATABASE REVIEW OF POTENTIAL RISK FACTORS, PREDICTORS AND INCIDENCE OF POST-CONCUSSION SYNDROME IN PEDIATRIC PATIENTS

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10.1136/jim-d-15-00013.5

Purpose of Study Concussions are traumatically induced injuries to the brain that are usually temporary in nature and associated with a disturbance in brain function. They are a form of mild traumatic brain injury, and are usually self-resolving within 1–2 weeks. However, a subset of those who suffer concussions experience symptoms that persist for an extended period of time. This condition, termed post-concussion syndrome (PCS), is an area in particular need of further research to determine predictors and risk factors that can be identified to help predict those at higher risk for this condition. This study investigated the clinical characteristics, demographics, and health outcomes of individuals seeking care for PCS at Banner University Medical Center Tucson to provide baseline data that can contribute to the identification of contributory factors for PCS.

Methods Used Patient databases were screened for possible cases of concussions as well as PCS. Records that meet screening criteria were abstracted for all data elements under a HIPAA waiver. These abstracted records were classified according to a standard case definition. Cases with

these selected developmental issues are analyzed using chi-square.

Summary of Results A database of 1038 children under 19 years seen from 2013–2015 was assembled and analyzed. Female gender was confirmed as a significant predictor of PCS (23% vs 18%). Insurance as a proxy showed higher incidence of PCS in patients with lower socioeconomic status (56%). There was no significant difference in race/ethnicity and development of PCS. Overall, 20% of the patient population went on to develop PCS averaging 17.8 weeks to resolve. Among those who developed PCS, 37% had abnormal vestibulo-ocular or balance testing on initial presentation to the clinic.

Conclusions These data demonstrate that certain populations are more vulnerable to PCS, and as a result, further investigation into the predictive nature of early clinical findings such as vestibular-ocular symptoms and balance errors is necessary to identify and effectively treat those who will go on to develop PCS.

6 EVALUATING TRENDS IN HEADACHE AND REVISION SURGERY FOLLOWING CRANIAL VAULT REMODELING FOR CRANIOSYNOSTOSIS

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10.1136/jim-d-15-00013.6

Purpose of Study Craniosynostosis is a condition in which the fibrous sutures between the bones of an infant's skull ossify and fuse prematurely. This can present as a single suture or multisuture fusion and in some cases has been attributed to an underlying genetic syndrome. The treatment for craniosynostosis is a surgical cranial vault expansion to prevent later onset of increased intracranial pressure (ICP) and potential developmental delays. The current guidelines for long-term management of these patients are not well-defined. The purpose of this project was to study whether certain factors are associated with increased risk of late-onset headaches or the need for revision cranial vault remodeling.

Methods Used The authors performed a retrospective review of patients treated in the Seattle Children's Hospital Craniofacial Center who had undergone cranial vault expansion for craniosynostosis between 1995 and 2010 and had been followed for a minimum of 5 years after surgery. Data collection included basic demographics, diagnosis, surgery type and CT imaging results. Primary outcomes included development of headache, delayed intracranial hypertension and the need for subsequent cranial vault remodeling. Logistic regression was used to evaluate associations between various factors and outcomes of interest.

Summary of Results Among the 353 patients included in the analysis, 30% had multisuture synostosis and 19% had syndromic synostosis. 127 (36%) patients complained of headaches following their initial cranial vault expansion, however no factors were found to significantly increase the risk for postoperative headaches. 21 (6%) patients went on to require revision surgery for intracranial hypertension, and we will present the trends identified for those patients.

Conclusions Although 1/3 of patients with a history of cranial vault expansion report headaches years after surgery, this is not a significant predictor for the need for additional surgery. The trends identified for those patients who required a revision surgery informed the design of our proposed clinical algorithm for use in triage management of children with a history of craniosynostosis who present with headache.

7 ASSOCIATION BETWEEN MINIMAL RESIDUAL DISEASE AND MITOCHONDRIAL DNA IN CHILDHOOD B-CELL LYMPHOMA

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10.1136/jim-d-15-00013.7

Purpose of Study Treatment for B-cell Lymphoma (BCL) in children and adolescents has contributed to their high Event Free Survival (EFS), but relapses and poor survival rates remain among high-risk children with BCL. One method for assessing clonal cells unique to BCL is the use of IgVH primer pools to detect MRD in peripheral blood (PB) specimens. Because of the sensitivity of MRD by our assay, assessing mitochondrial DNA (mtDNA) copy number may be useful as a tool to assess cell survival and thus useful to determine risk for relapse. The goal of this study is to assess MRD and mtDNA in patients with BCL for an association that may be valuable in predicting relapses.

Methods Used DNA was extracted from PB specimens obtained at entry and follow-up timepoints from children who were treated for BCL in a standard clinical trial. The IgH VH family usage was evaluated in DNA for MRD through semi-nested real-time PCR. The amount of mtDNA copies per cell was also evaluated in DNA from BCL patients.

Summary of Results Fifty-five patients had MRD and mtDNA assays performed and were categorized into three groups based on mtDNA copy number/cell at 9 weeks: Low (<300), Moderate (300–1000), and High (>1000). Of the 49 with MRD+, 40 patients had a low mtDNA copy number/cell, 6 patients had a moderate mtDNA copy number/cell, and 3 patients had a high mtDNA copy number/cell.

Conclusions The results suggest that mtDNA results may complement the use of MRD measurements in assessing risk for relapse. Since the clinical trial is still enrolling, further investigation is ongoing to determine the significance of MRD persistence with high mtDNA copy numbers to help identify children at risk and potentially improve prognosis.

Abstract 7 Table 1 Summary of Results

	Low mtDNA	Moderate mtDNA	High mtDNA
MRD Positive	40	6	3
MRD Negative	6	0	0

8 HOSPITAL COURSE OF PEDIATRIC PATIENTS ADMITTED FOR INTUSSUSCEPTION

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10.1136/jim-d-15-00013.8

Purpose of Study The need for hospitalization of pediatric patients post-reduction of intussusception has been a subject of debate. The purpose of this study is to evaluate the course of hospitalization among children admitted to the hospital post reduction of intussusception.

Methods Used We conducted a retrospective review of electronic medical records of patients who were hosptiatalized at the Children's Hospital of Orange County (CHOC) with a discharge diagnosis of intussusception between Jan 2005 to Dec 2014. The primary outcome assessed was the need for repeat ultrasound because of recurrence of abdominal pain and length of stay. Patients were excluded if they were previously admitted for a different episode of intussusception, failed reduction with the first enema and required surgery, or if the intussusception self-reduced during ultrasound without an enema.

Summary of Results Of 490 patients, 320 met inclusion criteria and of those, 33 (10.3%) were diagnosed with recurrent intussusception within 48 hours. Of 320 patients, 45 (14.1%) had an ultrasound after reduction within 24 hours, and of those, 21 (47%) were diagnosed with recurrent intussusception. Another 21 patients had an ultrasound between 24–48 hours, and of those 12 (57%) were diagnosed with recurrence. Of 33 with recurrence, 9 (27%) had been discharged and were diagnosed upon a return visit. 2 of 320 (<1%) who were initially reduced by enema required surgery becuase recurrent intussusception was un-reducible by enema. Comparing those with and without recurrence (Table), the length of symptoms prior to admission seemed to be longer but the difference was not statistically significant (2.03 d vs. 1.65 d, $P=0.087$).

Conclusions Our study shows that about 20.7% of patients post reduction of intussusception had a repeat ultrasound in the first 48hrs for abdominal pain, and about half of those had recurrent intussusception. It seems reasonable to admit patients with diagnosis of intussusception after reduction for observation.

Abstract 8 Table 1

	Recurrent Intussusception within 48 Hours	No Recurrence of Intussusception within 48 Hours
Total (n=320)	33 (10.3%)	287 (89.7%)
Ileocolic Intussusception after Therapeutic Enema (n=268)	31 (11.6%)	237 (88.4%)
Transient Ileocolic or Ileoileal Intussusception after Therapeutic Enema (n=49)	2 (4.1%)	47 (95.9%)
Duration of Symptoms Prior to Diagnosis	2.03 days	1.65 days
Mean Length of Stay	2.67 days	1.33 days

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9 DOES INFECTION TRIGGER THE IMMUNE SYSTEM FOR REJECTION OR ANTIBODY PRODUCTION AFTER HEART TRANSPLANTATION?

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10.1136/jim-d-15-00013.9

Purpose of Study It is well known that infections in immunosuppressed patients can trigger an immune response. It has been assumed that infections may even initiate rejection and/or the development of donor specific antibody (DSA). The type of infection also needs to be defined as different infections may have different activation of the immune system.

Methods Used Between 2010 and 2013, we assessed 252 transplant patients who had developed infection (treated with either oral or intravenous antibiotics) followed by subsequent rejection or development of de novo DSA within 1-month (in the first year after heart transplantation). The type of infection and the specific antibiotic treatment were recorded.

Summary of Results Between 2010 and 2013, we found 252 heart transplant patients who developed infection. There were only 14/252 infection episodes that led to rejection. The type of infection had no bearing on subsequent rejection. Similarly, 4/252 infection episodes led to the development of de novo DSA.

Conclusions Infectious complications are not common to trigger rejection episodes or the development of de novo DSA in the first year after heart transplantation. Increased rejection surveillance is therefore not necessary with every infectious episode.

Abstract 9 Table 1

Endpoints	Number of Patients (N=51)
Patients with Treated Infection w/in 1-Month Prior to Rejection	14/252 (5.6%)
Patients with Treated Infection w/in 1-Month Prior to de novo DSA	4/252 (1.6%)

10 IS CHRONIC LUNG DISEASE FEV1/FVC <70% A MARKER FOR PROLONGED INTUBATION IMMEDIATELY POST-TRANSPLANTATION?

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Purpose of Study Patients with chronic lung disease defined as FEV1/FVC <70% are known to have poor outcome after heart transplantation. Patients who are on

Abstract 10 Table 1

Endpoints	Group A 0–2 Days (N=120)	Group B 2–4 Days (N=157)	Group C >4 Days (N=45)	Log Rank P-Value
Pre-Transplant FEV1/FVC<70%	11.7% (14/120)	19.1% (33/157)	17.8%(8/45)	P=0.052 Group A vs. B
ECMO DuringVentilation	2.5%(3/120)	1.9%(3/157)	28.9%(13/45)	P<0.05 Group A vs. C Group B vs. C
1-Year Survival	92.0%	93.0%	66.6%***	<0.001
1-Year Freedomfrom Any Treated Rejection	82.0%	86.9%	77.9%	0.313

*p<0.05 compared to Group A (0–2 Days).
**p<0.05 compared to Group B (2–4 Days).

prolonged ventilation after heart transplant have increased risk. It is not known whether pre-transplant chronic lung disease FEV1/FVC <70% leads to prolonged ventilation post-transplant. We sought to describe this risk.

Methods Used Between 2010 and 2013, we assessed 322 heart transplant patients and divided them into various groups for ventilation time after transplantation. Patients were divided into those that were on the ventilator for Group A=0–2 days, Group B=2–4 days, and Group C=greater than 4 days. The percentage of chronic lung disease FEV1/FVC <70% patients was determined within each group. One year outcome was also determined for these patients in terms of any rejection and 1-year survival.

Summary of Results There was a strong trend for more chronic lung disease FEV1/FVC <70% patients requiring longer ventilation time (Group A, 0–2 days vs. Group B, 2–4 days, P=0.052, see table). Patients with greater than 4 day ventilation were complex patients that required extracorporeal membrane oxygenation (ECMO) post-transplant suggesting primary graft dysfunction (PGD), which is unrelated to pre-transplant chronic lung disease FEV1/FVC <70%. Survival for these prolonged ventilation patients was significantly worse.

Conclusions Patients with chronic lung disease FEV1/FVC <70% appear to have longer post-transplant ventilation but this did not appear to affect morbidity and mortality in the first year post-transplant. Patients with longer ventilation appear to be due to PGD requiring ECMO with subsequent poor outcome

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11 RESOURCE UTILIZATION IN THE STATE OF CALIFORNIA FOR NEONATES WITH HYPOPLASTIC LEFT HEART SYNDROME

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Purpose of Study While it is recognized that hypoplastic left heart syndrome (HLHS) in neonates is associated with significant mortality, there is limited information regarding health care resource utilization and predictors of length of stay (LOS) for survivors versus non-survivors.

Abstract 11 Table 1

	Survivor (n=194)	Non-Survivor (n=60)	P
Extracorporeal membrane oxygenation [ECMO](39.65)	10 (5.15)	15 (25.00)	<0.0001
LOS, median (IQR), days	29 (16–46)	8 (5–53)	0.0158
Charges ($/per 10K), median (IQR)	46 (24–82)	30 (10–90)	0.0530

Methods Used We studied data from the California Office of Statewide Health Planning and Development (OSHPD) for the years 2006–2010. Missing discharge status and repeated admissions were excluded. HLHS neonates with first admissions at less than or equal to 28 days were identified using ICD–9-CM codes (746.7); survival to discharge was determined based on OSHPD disposition codes. Bivariate tests were used to compare characteristics of survivors and non-survivors. Multivariable (MV) analysis was completed to identify predictors of LOS and charges.

Summary of Results 1,082,509 newborns were identified in the 2006–10 cohort. Of the 254 neonates identified with HLHS, mortality was 20.47%. Gender, Race, Insurance, and CCS designated NICU's were all insignificant among survivors v. non-survivors. Statistically significant differences were observed for several variables (Table 1). For survivors, on MV analysis, adjusting for sex, race, pay category, California Children's Services (CCS) designated NICU, use of ECMO increased LOS by 45 (95% CI 1.7, 88.0) and 18 (95% CI –1.9, 19.5) for non-survivors. For each day of hospitalization, charges incurred by non-survivors increased by 24K (95% CI 20K, 28K) and 13K (95% CI 11K, 14K) for survivors.

Conclusions ECMO increased LOS for both survivors and non survivors. However, for non-survivors, more required ECMO and each day of hospitalization incurred higher charges versus survivors. We identified several factors that could affect health care delivery for this high-risk population.

12 IS THE INCIDENCE OF ATRIAL SEPTAL DEFECTS INCREASED IN EXTREMELY LOW BIRTH WEIGHT INFANTS?

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Purpose of Study Patent foramen ovale (PFO) persists in up to 35% of adults as demonstrated by autopsies. Shunting through PFO is rarely detected beyond 18 days of life in term infants.The incidence of L-R shunt through PFO or Atrial Septal defect (ASD) in premature neonates in the absence of PDA beyond the neonatal period is not well studied. The objective of this study is to determine the incidence of persistent L-R shunt through PFO or PDA in

extremely low birth weight (ELBW) infants beyond the neonatal period.

Methods Used Retrospective data review was conducted from 2012 to 2013 of all ELBW infants admitted to the neonatal intensive care unit at Good Samaritan Hospital and LAC+USC Medical Center with routine echocardiogram (ECHO) performed prior to discharge. ECHOs were obtained with Philips IE33 using 8 to12 MHz transducer for imaging and color Doppler interrogation. Atrial septum was explored for the presence of shunting using subcostal coronal and sagittal cuts. Widths of color flow in both cuts were measured to a tenth of mm to indicate the volume of atrial L-R shunt. ELBW with multiple congenital anomalies and congenital heart disease were excluded.

Summary of Results A total of 44 ELBW infants had ECHO at a mean postnatal age of 2.6±0.6 months. None had PDA at the time of the study, 15 infants (34%) had no atrial L-R shunt. 9 infants (43%) had small shunt with a color flow width of 0–2 mm, 8 (18%) had moderate shunt with color flow width of 2–4 mm and 2 (4.5%) had large shunt with color flow width of >4 mm. The two infants with large L-R shunt had characteristics of ostium secundum ASD (OS ASD) with sharp edges to the defect and continuous systolic and diastolic flow.

Conclusions Large percentage of ELBW infants have persistent L-R shunts through atrial septal opening beyond the neonatal period. Two patients with large L-R shunt and characteristic of OS ASD may indicate that ELBW infants have a much higher incidence of OS ASD compared to the general population. Echo follow up is needed to document persistence of these defects to classify as congenital cardiac defect during infancy and childhood.

13 TRANS-CATHETER CLOSURE OF PATENT DUCTUS ARTERIOSUS IN SEVERELY PREMATURE NEONATES: A NEW TECHNIQUE FOR A VEXING PROBLEM

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Purpose of Study Surgical ligation of patent ductus arteriosus (PDA) in the premature newborn has been associated with significant procedural morbidity and adverse long-term outcomes. We developed a new trans-catheter PDA closure (TC-PDA-C) technique applicable to this population. The purpose of this study was to describe our initial experience.

Methods Used This is a retrospective review of all premature newborns referred for PDA ligation at our institution between 3/13–2/15. Each infant was screened by a multidisciplinary team for consideration of TC-PDA-C. Procedures were performed under general anesthesia using a combination of fluoroscopic and echocardiographic imaging with all but 2 procedures being performed using solely femoral venous access. Contrast angiography was not utilized and the Amplatzer vascular plug II (a commercially available device) was used in all cases.

Summary of Results Twenty-seven newborns were referred for PDA ligation of which 24 underwent attempted TC-PDA-C, 21/24 (88%) of which were successful. Median weight, corrected gestational age and age were 1152 gm (755–2380 gm)/30 weeks/22 days (5–80 days), respectively. Median procedural and fluoroscopy times were 38 (21–151) and 8.7 (0–28) minutes. Procedural complications included one instance of device malposition resolved with device repositioning and 1 instance of left pulmonary artery stenosis, resolved with a left pulmonary artery stent. There were no instances of residual PDA shunting, device embolization, hemodynamic compromise or death. The 3/24 patients who had devices implanted and removed prior to release all underwent uncomplicated surgical ligation (2/3 under the same anesthetic). Survival to discharge for the entire cohort was 96% (23/24) and at median follow-up of 507 (100–921) days we have observed no late complications or deaths.

Conclusions TC-PDA-C appears to be a safe and effective method of PDA closure in severely premature neonates. Future efforts should be aimed at developing specific devices for this unique population and comparing this new technique to traditional surgical ligation in terms of procedural complications, peri-procedural morbidity and long-term outcome.

14 CELIAC TRUNK CALCIFICATION: ASSOCIATIONS WITH RISK FACTORS, SYSTEMIC CALCIFIED ATHEROSCLEROSIS, AND MORTALITY

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Purpose of Study This study examines the associations of celiac trunk calcification (CTC) with cardiovascular disease (CVD) risk factors, systemic calcified atherosclerosis, and mortality.

Methods Used Vascular calcification was evaluated by computed tomography in 4302 adult outpatients with no known CVD; laboratory values and medical histories were taken at this time. Risk factor associations for CTC presence were examined by Firth logistic regression, fully-adjusted for CVD risk factors (age, sex, BMI, any smoking, dyslipidemia, hypertension, diabetes, family history of CVD) and calcification in the abdominal aorta, thoracic aorta, coronary arteries, iliac arteries and superior mesenteric artery. In a separate logistic regression model, CTC presence was examined as a predictor for systemic calcified atherosclerosis, represented in this study as having calcification in all five other vascular beds. A fully-adjusted Cox model was used to examine the association of CTC presence with mortality.

Summary of Results In the study sample, mean age was 56 years, 43.6% were women, and 2.8% had CTC. Higher age (odds ratio[OR]=1.08, 95% confidence interval [1.05–1.11]), male sex (OR=2.02, 95% CI [1.28–3.26]), BMI (OR=1.01, 95% CI [1.00–1.02]) and family history of CVD (OR=1.60, 95% CI [1.06–2.41]) were significantly associated with greater odds for the presence of CTC when fully-adjusted for CVD risk factors and calcification in other vascular beds. Diabetes approached significance (OR=1.81, 95% CI [0.95–3.32]). CTC presence was associated with significantly higher odds for calcification in all other vascular beds (OR=6.40, 95% CI [4.08–10.04])

when adjusted for CVD risk factors. Over a median follow-up time of 9.4 years, there were 234 (5.4%) deaths. CTC presence was associated with a non-significant hazard for mortality (HR=1.11, 95% CI [0.73–1.69]) when fully adjusted.

Conclusions CTC is relatively uncommon and its presence is significantly associated with age, sex, BMI and family history of CVD. CTC presence is also associated with significantly greater odds for calcification in all five other vascular beds, suggesting that CTC calcification may be related to subclinical, yet advanced, systemic atherosclerotic disease. However, the association between CTC presence and mortality is non-significant.

15 ORGAN TURN DOWN AT A SINGLE CENTER: DONOR HEART ORGAN TURN DOWN, IS IT RATIONAL?

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10.1136/jim-d-15-00013.15

Purpose of Study Donor heart selection for heart transplantation is not standardized. Donor hearts are declined for reasons including function, size mismatch, hypertrophy, and recipient factors such as mechanical circulatory support (MCS) dependence, ventilator dependence, diabetes, renal insufficiency, donor cold ischemic time (CIT), etc. It has not been substantiated as to what factors are most prevalent in donor heart turn-down for specific recipients.

Methods Used Between 2010 and 2015, we assessed 784 donor heart offers. We found 270 declined heart donors with a total of 307 reasons for organ decline. Poor quality was characterized by older donor age, presence of hypertension and diabetes, cardiac arrest, evidence of infection, high dosage of vasopressors/medication, etiology of death, other medical history. Duplicate offer was defined by the potential recipient being transplanted or having another donor heart offer. Human leukocyte antigen (HLA) factors were defined by unacceptable D/R HLA antigens, D/R positive crossmatches, or unavailability of serum for crossmatching. Recipient factors included the recipient refusing transplant, not being located, or too sick at time of offer. Combination transplant was defined for need of multiple organ transplants or an organ of different laterality.

Summary of Results The most common cause for donor heart turn-down was size mismatch between donor/recipient (D/R) followed by poor quality, duplicate offer, social history/CDC risk, recipient factors, HLA factors, and combination transplant. See table.

Abstract 15 Table 1

Endpoints	Reasons for Refusal (N=307)
Size Mismatch between Donor/Recipient	36.9% (128/347)
Poor Quality	25.6% (89/347)
Duplicate Offer	11.2% (39/347)
Social History/CDC High Risk	2.9% (10/347)
Recipient Factors	2.3% (8/347)
HLA Factors	7.5% (26/347)
Combination Transplant	2.0% (7/347)

Conclusions A majority of donor hearts are turned down for size mismatch and not quality. These hearts are most likely used by other programs where D/R size matching is appropriate. Further investigation into donors with poor quality should be pursued as some may be viewed acceptable by other programs. A donor/recipient scoring system may be helpful to minimize turned down donor hearts.

Endocrinology and Metabolism I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

16 GROWTH HORMONE IS INVOLVED IN HUMAN COLON TUMOR GROWTH

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10.1136/jim-d-15-00013.16

Purpose of Study Growth hormone (GH) is proposed to impact the development of colon neoplasms. Patients with GH overexpression (acromegaly) exhibit an increased incidence of colon polyps and nearly two fold increase in risk for colon cancer development. Patients with GH receptor (GHR) mutations (Laron Syndrome), exhibit reduced risk for developing cancer. GH deficient mice exhibit a decreased risk of tumor formation. Pegvisomant, a GHR antagonist, diminishes progression of colon cancer in some models. Local GH expression in mammary epithelial cancer cells shows an induction of mesenchymal phenotype transition. We hypothesized that local GH in colon tissue can determine growth of colon tumors.

Methods Used We used confocal fluorescent microscopy to test GH and GHR expression in humor colon tissue and assessed co-localization of GH with alpha smooth muscle actin, a marker of fibroblasts. We compared tissue samples derived from normal colons, benign adenomas, adenocarcinomas, and colon metastases through individual specimen preparations and composite tissue arrays.

Summary of Results We observed that both adenocarcinoma and tumor-associated fibroblasts express GHR. We found that fewer adenocarcinoma neuroendocrine epithelial cells displayed GH expression than those in normal human colon tissue (0/32 adenocarcinoma specimens exhibit multiple GH expressing epithelial cells compared to 15/25 in normal colon tissue). Fibroblasts in the lamina propria of adenocarcinoma specimens exhibit more abundant levels of GH expression than in normal colon tissue (8/32 adenocarcinoma samples exhibit high levels of GH expression, compared to 0/25 in normal colon tissue).

Conclusions These results imply that GH is expressed in cells comprising the tumor microenvironment and may act in a paracrine fashion via GHR. As colorectal cancer is one of the most common causes of cancer related deaths globally, elucidating a local GH signaling pathway would

represent a novel therapeutic target for prevention of colon adenoma-adenocarcinoma transition.

17 FOLLISTATIN PROTECTS AGAINST DIET-INDUCED OBESITY AND IMPROVES GLOBAL METABOLOMICS IN ADIPOSE TISSUES

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10.1136/jim-d-15-00013.17

Purpose of Study High obesity rates are linked to many metabolic diseases. Perturbations in overall tissue metabolism significantly contribute to the development of these diseases. We have recently demonstrated that follistatin (Fst) enhances brown adipocyte characteristics and regulate overall energy metabolism *in vitro*. The purpose of the present study is to determine the effects of diet-induced obesity (DIO) in Fst transgenic (Fst-Tg) mice and compared the metabolomics profiling of epididymal (EP) and subcutaneous (SC) adipose tissues isolated from wild type (WT) and Fst-Tg mice to identify differentially expressed metabolites and investigate their specific roles during development of obesity and other metabolic diseases.

Methods Used Mice were fed normal or high fat chow for 6 weeks. Body weight and abdominal fat content was analyzed by MicroCAT II imaging. Metabolomics profiling of EP and SC tissues was performed using liquid/gas chromatography coupled to mass spectrometry (LC/GC-MS), and LIMS bioinformatics were performed. Gene and protein expression of branched chain amino acids (BCAA) and their catabolic enzymes BCAT2 and BCKDHA were analyzed by qRT-PCR and western blot analysis. Glucose tolerance test (GTT) and serum profiles (ELISA) were compared between the groups.

Summary of Results Fst-Tg mice are resistant to DIO. EP adipose tissues from Fst-Tg mice had significantly decreased levels of BCAA and other metabolites known to be induced in obese and diabetic subjects with insulin resistance, but increased levels of BCAT2 and BCKDHA compared to the WT mice. Fst-Tg mice show significantly enhanced glucose clearance and improved serum triglyceride (TG), free fatty acid (FFA) and glucose levels.

Conclusions Fst over-expression protects mice from DIO and favorably influenced key metabolites implicated in obesity and diabetes, suggesting a novel therapeutic potential for Fst and related compounds for the treatment of obesity related metabolic syndromes.

18 ESCALATING DOSES OF TESTOSTERONE INCREASE LEAN BODY MASS AND HEMATOCRIT WITHIN THREE MONTHS, IN HEALTHY MEDICALLY CASTRATE MEN

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10.1136/jim-d-15-00013.18

Purpose of Study Sex steroids are known to impact body composition. Recent data has highlighted that testosterone and estradiol have differential impacts on various body tissue compartments, with androgens predominantly driving lean body mass accumulation and estradiol playing a role in the regulation of adipose stores. We investigated whether changes in body composition could be manifest as early as 3 months with alterations in sex steroid concentrations in healthy men and compared these changes to changes in hematocrit, a parameter well known to be androgen-regulated.

Methods Used A 12-week, double-blinded, randomized, placebo-controlled trial was conducted in an academic center. 53 healthy male volunteers, ages 25–55 years, with normal testosterone (T) concentrations were randomly assigned to one of 6 groups (8–9 subjects per group) and received placebo injections every 2 weeks and daily placebo transdermal gel (control), or injections of acyline (300 μg/kg), a potent and rapidly acting GnRH antagonist (to achieve medical castration), plus transdermal 1% T gel (1.25 g, 2.5 g, 5.0 g, 10 g or 15 g daily) to produce serum T levels across the physiologic range.

Summary of Results Average serum T concentrations increased in a dose dependent manner across the groups ($p<0.001$) producing a range from hypogonadal to the higher end of normal. Average serum estradiol concentrations showed a similar dose-response relationship across the groups ($p<0.0001$). Lean mass (kg) increased in the 15 g T dose group (where serum T concentrations were at the high end of the normal range), relative to all other groups, except the 10 g T group ($p=0.01$ for change in lean mass across groups). However, change in total fat mass or percent fat was not significantly different between the groups. Hematocrit was different across the groups at end of treatment ($p=0.009$). The 1.5 g T and 2.5 g T had lower hematocrits than the 10 g T and 15 g T groups.

Conclusions In healthy, medically castrate men treated with incremental doses of exogenous T, lean mass and hematocrit increased with higher concentrations of serum T while fat mass remained stable across the mid-normal range of serum T and E concentrations.

19 CYSTIC FIBROSIS RELATED DIABETES IS A PREDICTOR OF INCREASED INCIDENCE OF CHRONIC *PSEUDOMONAS AERUGINOSA*

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10.1136/jim-d-15-00013.19

Purpose of Study As the life expectancy of cystic fibrosis (CF) patients has increased, cystic fibrosis related diabetes (CFRD) has become a more frequent comorbidity. Chronic *Pseudomonas aeruginosa* (*Pa*) lung infection is common in CF. Both CFRD and chronic *Pa* are associated with significant morbidity and increased mortality. Whether CFRD predicts the development of chronic *Pa* or whether the conditions are simply associated is unknown.

Methods Used A retrospective dynamic cohort of individuals with CF enrolled in the national CF Foundation Patient Registry were analyzed. Individuals entered the

cohort at age ≥13 years and left the cohort at development of chronic *Pa* or lung transplant or death. Multivariable regression models accounting for within patient correlation with generalized estimating equations were used to assess the change in incidence of developing chronic *Pa* infection between 2003 and 2012 based on CFRD status. CFRD status was evaluated annually in 3 different ways: 1) CFRD encounter diagnosis; 2) chronic insulin use; 3) HbA1c measurement ≥6.5. Age, age at diagnosis, gender, genotype, pancreatic insufficiency and baseline lung function were adjusted for in the model.

Summary of Results During the ten-year observation period, 15,504 individuals were followed for a median of 5 (IQR 2–9) years. The incidence of developing chronic *Pa* decreased from 14.1% in 2003 to 6.2% in 2012. After adjusting for potential confounding, CFRD encounter diagnosis significantly increased the relative risk of developing chronic *Pa* infection (1.21, 95% CI: 1.14–1.28, P<0.0001). Chronic insulin use was also associated with increased relative risk (1.17, 95% CI: 1.09–1.25, P<0.0001). Both higher HbA1c and HbA1c ≥6.5 also increased this risk compared to normal HbA1c (1.05, 95% CI: 1.02–1.08, P=0.001; 1.17, 95% CI: 1.02–1.33, P=0.02 respectively).

Conclusions CFRD diagnosis was associated with an increased risk of developing chronic *Pa* infection during the observation period compared to not having CFRD. Whether this relationship is seen with other infections common in CF and whether early and more aggressive treatment of CFRD results in changes in *Pa* rates warrants further investigation.

20 NON-ALCOHOLIC FATTY LIVER DISEASE IN OBESE ADOLESCENT GIRLS IS ASSOCIATED WITH INSULIN RESISTANCE AND PREDICTORS OF CARDIOMETABOLIC DISEASE

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10.1136/jim-d-15-00013.20

Purpose of Study Approximately 1/3 of obese adolescents have non-alcoholic fatty liver disease (NAFLD), which may increase their risk of cardiometabolic disease. Studies of NAFLD in adolescent girls are limited, and the role of concurrent type 2 diabetes (T2D) or hyperandrogenism (HA) is unclear. Treatment options are limited, in part due to poor understanding of associated pathogenesis. In adults, NAFLD correlates with increased visceral fat, free fatty acids (FFA), and insulin resistance (IR). We hypothesized that obese girls with NAFLD would have adipose, hepatic, and muscle IR and increased predictors of cardiometabolic disease relative to similarly obese girls without NAFLD.

Methods Used NAFLD was defined as liver fat >5.5% on MRI. 73 obese, Tanner stage 4/5 adolescent girls with and without T2D or HA were stratified by amount of hepatic fat [n=29, median age=15 years (25th %ile=13,75th % ile=16), BMI%ile=99 (98,99), liver fat %=10.4 (8.2,12.8)] or absence [n=44, age=15 years (13,17), BMI %ile=99 (96,99), liver fat %=2.0 (1.1,3.0)]. A 3-stage hyperinsulinemic euglycemic clamp with isotope tracers was performed to measure tissue-specific IR. Data were compared using linear models adjusted for ethnicity and T2D or HA status.

Summary of Results Girls with NAFLD had adipose, hepatic, and muscle IR, as evidenced by higher FFA's following hyperinsulinemia [NAFLD=66 mmol/ml (43,112), Non-NAFLD=40 mmol/ml (20,64), p=0.008], failure to suppress hepatic glucose release during extreme hyperinsulinemia [NAFLD=0.18 (0,0.65), Non-NAFLD=0.03 (–0.15,0.23), p=0.002], and a lower glucose infusion rate (NAFLD=4.7 mg/kg/min (2.5,6.6), Non-NAFLD=6.4 mg/kg/min (3.8,8.6), p=0.012). Girls with NAFLD also had more visceral fat [NAFLD=98.5±26.0 cm^3, Non-NAFLD=57.7±29.5 cm^3, p<0.001] but not subcutaneous fat. They also had higher inflammatory markers, systolic blood pressures, ALT, and fasting triglyceride and insulin concentrations.

Conclusions Obese adolescent girls with NAFLD, when compared to girls of similar BMI and adiposity, have evidence of IR and markers of early cardiometabolic disease regardless of ethnicity or presence of T2D or HA. Thus, obese female adolescents with NAFLD must be considered at high risk for cardiometabolic disease and screening for associated conditions should be performed.

21 Cancelled

22 THE EFFECT OF OBESITY AND INSULIN RESISTANCE ON REPRODUCTIVE FUNCTION IN EARLY PUBERTAL BOYS

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10.1136/jim-d-15-00013.22

Purpose of Study Little is known about effects of obesity on reproductive function and pubertal development in boys. We evaluated relationships among obesity, insulin sensitivity, and reproductive hormones in early pubertal boys, hypothesizing that obesity and insulin resistance would be associated with hypogonadism.

Methods Used Participants included 27 lean (BMI 5–85% ile) and 21 obese (BMI >95%ile) early pubertal (Tanner 2–3) males without prediabetes or diabetes. Serum dehydroepiandrosterone sulfate (DHEA-S), sex hormone binding globulin (SHBG), and total testosterone were measured, and free androgen index (FAI) was calculated. Insulin sensitivity (Si) and acute insulin response (AIRg) were calculated using Bergman's minimal model based on intravenous glucose tolerance tests. Linear regression analysis detected associations between Si or AIRg and reproductive hormones. Models were adjusted for Tanner stage; Si and AIRg were log-transformed.

Summary of Results Obese early pubertal boys had lower Si at baseline (p=0.0002) and greater AIRg (p<0.0001) than their lean counterparts. Obese boys had lower SHBG

($p<0.0001$), lower total testosterone ($p=0.0004$), and trended toward higher DHEA-S ($p=0.09$). FAI was similar between lean and obese boys. Si was positively associated with SHBG ($R^2=0.511630$, $p<0.0001$) and inversely related to DHEA-S ($R^2=0.184660$, $p=0.0146$).

Conclusions As expected, obese boys are more insulin resistant than lean boys early in puberty, but exhibit compensatory insulin secretion. The inverse relationship between Si and DHEA-S has been reported in puberty; however, it is unknown whether DHEA-S is a cause or result of pubertal decreased Si. Although FAI, which should represent bioavailable testosterone, is similar between lean and obese boys, SHBG and total testosterone are significantly lower in the obese boys. Therefore, total testosterone, which is used in clinical practice, may not be a good measure of reproductive function in obese boys during puberty. Larger longitudinal studies are needed to better understand the effects of obesity and decreased Si on reproductive function in adolescents.

Health Care Research I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

23 INTENSE THERAPEUTIC ULTRASOUND IN THE MANAGEMENT OF PATIENTS WITH CHRONIC PLANTAR FASCIITIS

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10.1136/jim-d-15-00013.23

Purpose of Study Plantar fasciitis (PF) is a common cause of heel pain. Heel cord tightness leads to chronic repetitive stress on the plantar fascia and disordered healing at its calcaneal insertion. PF responds to conservative treatment (NSAIDs, heel cups, stretching) in 90% of patients, but takes 3–6 months to achieve symptom resolution.[1] Intense therapeutic ultrasound (ITU) uses high-intensity focused ultrasound to create small thermal injuries in soft tissue without damaging adjacent structures. ITU has been shown to initiate a repair cascade and collagen generation in musculoskeletal tissue and is FDA approved for use in brow lifts.[2] It was hypothesized that ITU may have the potential to hasten recovery from PF when combined with standard treatment. The goal of this study was to evaluate that potential.

1. Davis PF *et al*. Painful heel syndrome: results of nonoperative treatment. *Foot Ankle Int* 1994;15:531–5.

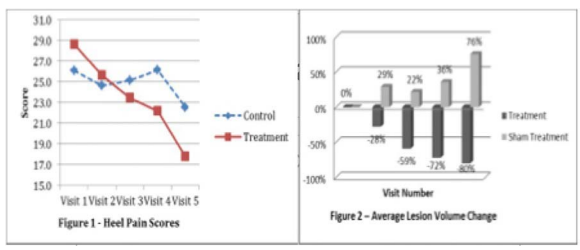

Figure 1

2. Slayton, M., Barton, J. K., *Healing Tissue Response with ITU in Musculoskeletal Tissue, Feasibility Study*, IEEE Ultrasonics Symposium, Chicago, IL, Sep. 2014.

Methods Used We conducted a double blinded, randomized, sham controlled trial. Twenty-four patients with chronic (>3 months) PF were randomized to receive ITU plus standard therapy (n=17) or sham ITU plus standard therapy (n=7). Effect was assessed at 2, 4, 6, and 12 weeks post-treatment, using diagnostic ultrasound to determine perifascial lesion size and patient reported outcomes to quantify heel pain.

Summary of Results The treatment group reported progressively lower heel pain scores, while scores in the control group remained constant (figure 1). Ultrasound imaging also showed decreasing perifascial lesion size in the treatment group, with slightly increasing sizes in control subjects (figure 2).

Conclusions Preliminary results showed significant improvement following ITU treatment in heel pain and size of perifascial lesions during 12 week follow-up, suggesting that ITU may decrease healing time for patients with chronic PF.

24 A BIOFEEDBACK SMART CANE TO REDUCE KNEE LOADING ASSOCIATED WITH OSTEOARTHRITIS

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10.1136/jim-d-15-00013.24

Purpose of Study An estimated nine million Americans suffer from knee OA. Stance phase knee adduction moment (KAM) has been found to have a strong correlation with the progression of knee OA. The walking cane has been established as an effective tool to reduce KAM. We developed a novel smart cane that provides users with cane load biofeedback to explore the effects of biofeedback on cane loading and KAM. We hypothesized that compared to naïve cane use, smart cane and conventional scale training would increase cane loading and reduce the peak KAM and KAM angular impulse.

Methods Used Seven individuals with knee OA who use a walking cane completed three cane walking conditions: 1) naïve, 2) after training with a scale, and 3) smart cane. The scale training and smart cane conditions were randomized and included two sets of trials separated by a five minute break to evaluate the short-term recall of the training. During scale training, subjects used a scale to load the cane to 20% of their body weight (BW). The smart cane was programmed to provide vibrational feedback at 20% of the subject's body weight. Motion capture and inverse dynamics were used to calculate the peak KAM and the KAM angular impulse.

Summary of Results Scale training and smart cane use increased cane loading from the naïve condition (9.9 ±2.9% BW). Cane loading was similar between scale training (21.9±6.3% BW) and smart cane use (23.6±1.8% BW). Scale training and smart cane greatly reduced peak KAM and KAM angular impulse compared to naïve cane

use (2.5±1.2% BW*Ht, 1.2±0.6% BW*Ht*s). Peak KAM and KAM angular impulse were similar between scale training (1.7±1.1% BW*Ht, 0.6±0.7% BW*Ht*s) and smart cane use (1.9±0.9% BW*Ht, 0.6±0.4% BW*Ht*s).

Conclusions These results demonstrate that the smart cane increases cane force and reduces the peak KAM and KAM angular impulse which may slow OA progression. The smart cane is as effective as scale training, but has the potential to provide a low-cost alternative to clinical training and may have better long term performance.

25 A REVIEW OF THE CHARACTERISTICS OF VALIDATED QUALITY OF LIFE (QOL) PATIENT REPORTED OUTCOME MEASURES (PROMS) IN PAEDIATRIC PLASTIC SURGERY

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10.1136/jim-d-15-00013.25

Purpose of Study Pediatric quality of life, QOL assessment through patient reported outcome measures, PROMs are well recognized and increasingly important in clinical practice and research. The aim of this review is to identify the most frequently used validated PROMs in pediatric plastic surgery and determine their measurement properties.

Methods Used The most frequently validated PROMs were identified from a review of the literature from 2010–2015. The PROMs were then classified into generic, disease specific, and mental health. Within these classifications, the domains, reliability, validity were analyzed.

Summary of Results Fourteen questionnaires were identified and classified into: generic (7), disease specific (4), and mental health (3). The distribution of domains by class was as follows. Both the minimum and maximum internal reliability scores were above 0.70 for 4/7 generic questionnaires, 1/4 disease specific questionnaires, and 0/3 mental health questionnaires. The three highest internal reliability scores were associated with a physical functioning domain. Construct validity was the most often reported validation form for each class of questionnaire: generic 92%, disease specific 67%, and mental health 57%. There was no trend with respect to cost or number of items and the frequency of uses.

Conclusions Although validated generic questionnaires are the most frequently used, disease specific questionnaires contain a larger number of physical functioning domains that are associated with higher reliability scores. This finding underscores the need to further develop disease specific PROMs in pediatric plastic surgery.

Abstract 25 Table 1

	General	Social	Psychological	Physical
Generic	20%	24%	28%	28%
Disease Specific	15%	23%	31%	31%
Mental Health	0%	43%	43%	14%

26 REDUCING EXPOSURE OF HEALTH CARE JANITORIAL WORKERS TO PERACETIC ACID, SPORICIDAL TO *CLOSTRIDIUM DIFFICILE*

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10.1136/jim-d-15-00013.26

Purpose of Study Thirty janitorial workers (JW) reported upper airway and eye irritation, sinus obstruction, chest tightness and dyspnea soon after introduction of a cleaning fluid containing peracetic acid (PAA), a potent sporicide. Retraining on proper application techniques and personal protective ensembles was provided. We evaluated the effect of retraining on symptoms and breathing-zone concentrations (BZC) of PAA vapor.

Methods Used Post-retraining interviews focussed on symptoms during use of the PAA-cleanser. Ten BZC air samples were obtained during routine cleaning or PAA dispensing in three JW, using standard monitoring methods with silica gel tubes. Results were compared with the 2014 Short Term Exposure Limit (STEL, 0.4 ppm for 15 minutes) of the American Conference of Governmental Industrial Hygienists (ACGIH).

Summary of Results After retraiining, none of the JW described symptoms during use of the PAA-containing cleanser. The highest BZC of PAA was 0.36 ppm. Other concentrations were at or below the level of detection. As shown in the Table, mean values were similar to those of the manufacturer and lower than the mean value in a large midwestern hospital.

Conclusions Though no air monitoring was done during the early symptoms of JW using a newly-introduced PAA liquid cleanser, all 10 air samples obtained in three JW after retraining were below the STEL established in 2014 by the ACGIH. This cleanser has similar sporicidal effectiveness to sodium hypochlorite bleach but is less damaging to surfaces. Although retraining of our JW was followed by elimination of symptoms, and air sampling results below the STEL, it is important to recognize that this PAA concentration is limited to 15-minute exposure periods which are to be separated by PAA-free intervals of at least one hour.

Concentrations of PAA in Breathing-zone Air During Hospital Cleaning Activities, ppm (mean +/– SD).

Abstract 26 Table 1

	Carolinas HealthCare	Manufacturer	Midwestern Hospital
Vacated Rooms	0.22+/–0.14 (N=4)	0.21+/–1.0 (N=27)	0.62+/–0.25 (N=9, various activities)
Bathrooms	<0.16 (N=1)	0.18+/–0.9 (N=17)	
Dispensing POA	<0.16, <0.16 (N=2)	0.06+/–0.05 (N=7)	

N, number of air samples. Carolinas HealthCare values were measured after re-training was conducted.

027 EMERGENCY PHYSICIAN UTILIZATION OF ULTRASOUND IN ARIZONA

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10.1136/jim-d-15-00013.27

Purpose of Study Point-of-care ultrasound (POCUS) has been defined as an integral component to the practice of emergency medicine (EM). New guidelines require residents to demonstrate proficiency in POCUS and nearly all academic EM programs provide dedicated ultrasound training. Previous studies have indicated that there remains variability in the use of ultrasound in non-academic emergent care settings. The purpose of this study is to better understand the current use of POCUS in community, non-academic emergency departments throughout the state of Arizona.

Methods Used This was a cross-sectional study. An online questionnaire on the use of POCUS in the emergency department was electronically sent to all of the medical directors or ultrasound directors at each non-academic emergency department in Arizona. The survey consisted of questions regarding demographics, current practice patterns, policies, interdepartmental agreements, and perceptions regarding the use of POCUS in the emergency department (ED).

Summary of Results A total of 70 community, non-academic EDs were identified for inclusion in our study. To date, 28 EDs have completed the survey, representing a 40% response rate. All (28/28) EDs have a dedicated ultrasound machine. 75% (95% CI 56% –94%) of EDs perform or interpret POCUS for patient care. The three most common applications of POCUS indicated by responders were FAST exam, cardiac ultrasound (for code arrest), and line placement. Only 40% (95% CI 19%–61%) indicated that ultrasound experience is important in hiring decisions for ED physicians. Although 55% (95% CI 33%–77%) of EDs have an ultrasound director or similar position filled, 80% (95% CI 62%–98%) reported that they do not assess ED physicians in POCUS competency; 50% (95% CI 28%–72%) of EDs indicated that they do not provide any POCUS training. 65% (95% CI 44%–86%) of EDs perform less than 20 ultrasounds per week. Only 30% (95% CI 10%–50%) of EDs bill for POCUS.

Conclusions In the state of Arizona, a majority of non-academic emergency departments have access to ultrasound machines and have ultrasound privileges. However, only a small minority bill for ultrasound or provide regular assessment of this skill.

28 EXPLORING PALLIATIVE CARE CONSULTATIONS IN THE NEURO-INTENSIVE CARE UNIT

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10.1136/jim-d-15-00013.28

Purpose of Study Palliative care (PC) is an interdisciplinary medical service for patients with serious illness. In the neuro-intensive care unit (NeuroICU), little is known about the PC needs of patients with severe brain injury or how to best meet them; PC specialists are consulted for some patients but guidance is lacking regarding indication or ideal timing for PC consultation. We explored characteristics of NeuroICU patients receiving a PC consultation and what PC issues were addressed.

Methods Used We identified all patients admitted to the NeuroICU between January and August 2014 who received a PC consultation during their NeuroICU stay. Using these patients' electronic health records, we performed content analysis on the PC consult notes and the primary team's progress notes from admission until the day of PC consultation. We used qualitative analysis methods to code the notes and explore emerging themes discussed.

Summary of Results Records of 25 patients were analyzed until thematic saturation was reached. Time from admission to PC consult ranged from 0–52 days (mean 11.7). Mean patient age was 59.7 years (SD 18.8); main diagnoses were stroke (40%) and traumatic brain injury (28%). On the day of the PC consult, the patient's mean Glasgow Coma Scale score was 9.3 (IQR 6.5–11). Half of the patients (14 out of 25) either died or were discharged to hospice from the NeuroICU. The most common stated reason for PC consultation was assistance with clarifying goals of care. The four most prevalent themes discussed during PC consultation were 1) prognosis; 2) eliciting/identifying patient values; 3) interpreting medical information; and 4) identifying conflict. The most prevalent recommendation from PC specialists involved patient and/or family communication preferences.

Conclusions Palliative care consultations in the NeuroICU help by identifying patient values; these values are discussed in light of prognosis and help establish context in order to align treatment goals with patient preference. PC also assists by ensuring treatment options are understood by the patient and/or family. Further research is needed to determine the PC needs of patients and their families in the NeuroICU and how best to meet them. Results of these analyses will have clinical implications for improving PC practice in the NeuroICU.

29 FACTORS AFFECTING PATIENTS' DISCUSSIONS ABOUT END-OF-LIFE CARE

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10.1136/jim-d-15-00013.29

Purpose of Study Conversations about end-of-life care are often difficult for both patients and clinicians, and inadequate patient-clinician communication poses a significant barrier for patients to receive the care they desire. A better understanding of the factors that encourage communication about end-of-life care may guide the design and implementation of successful interventions.

Methods Used In this observational analysis using data from an ongoing randomized trial of an outpatient communication intervention, we evaluated associations between patients' self-reported desire for, and occurrence of, discussions with their clinicians about care that they would like at the end of life and factors influencing these outcomes.

Factors included patients' health status, emotional symptoms, barriers and facilitators to discussions, and religious/spiritual attitudes. Data were obtained from patients' self-reported baseline questionnaires. The sample included patients with serious illness (n=197) receiving on-going care from participating primary or specialty care clinicians (n=67). Regression analyses were adjusted for covariates and clustered patients under clinicians.

Summary of Results Factors associated with having had discussions included: 1) patients with higher depression scores (p=0.018); and 2) patients who indicated that their religious beliefs influenced their medical care (p=0.045). By contrast, patients who endorsed the barrier, "not feeling sick enough to speak to his/her doctor," were less likely to have had a discussion with their current clinician (p=0.008). Facilitators associated with wanting more discussions included: 1) concerns about future quality of life (p=0.004); and 2) concerns about being a burden on friends/family (p=0.027). Health status and symptoms of anxiety were not associated with having had, or wanting, discussions.

Conclusions The occurrence and desire for clinician-patient communication about end-of-life care is associated with patient-centered factors including symptoms of depression, religious/spiritual beliefs, and illness-related experiences or concerns. An understanding of these factors may assist with the design of effective communication interventions as well as provide guidance to individual practitioners discussing end-of-life care with their patients.

30 SEROLOGIC IMMUNITY AGAINST VARICELLA, MUMPS, RUBEOLA, RUBELLA AND HEPATITIS B IN HEALTH CARE APPLICANTS WITH INDETERMINATE IMMUNIZATION HISTORY

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10.1136/jim-d-15-00013.30

Purpose of Study To compare serologic evidence of varicella immunity with immunity to mumps, rubeola, rubella and hepatitis B in applicants for healthcare positions who lack written documentation of prior such immunizations.

Methods Used During 2014–2015, all applicants for clinical jobs in Carolinas HealthCare System (CHS) were screened by medical record review for documented history of chickenpox or verified immunization series for varicella, mumps, rubeola, rubella and hepatitis B. For those applicants without such documentation, confirmatory blood titers were checked. Negative serologic testing included absent or borderline titers.

Summary of Results Serologic testing yielded the following results.

Abstract 30 Table 1

Varicella	Varicella	Mumps	Rubeola	Rubella	Hepatitis B
Positive n	4987	2290	2220	2356	2154
Negative n	129	210	249	121	711
% Negative	2.6	9.2	11.2	5.1	33.0
Chi square vs. Varicella	–	136.5	201.2	29.3	969.4
p<	–	0.01	0.01	0.01	0.01

Conclusions Varicella seronegativity in applicants for CHS healthcare jobs was rare and significantly less than for other communicable viruses. Widespread use of electronic medical records over time should reduce the need for serologic testing. For now, such low varicella seronegativity prevalence raises questions over the cost/benefit function of routine serologic testing and immunization if needed (estimated at $53,500 per 1000 applicants) versus empiric vaccine administration (two immunizations, $140,000 per 1000 applicants) to all those with indeterminate immunization history for this virus. Costs due to possible adverse effects of varicella vaccine were not included. Human and monetary costs of a hospital-acquired varicella pneumonia could be immense.

Protective titers against varicella were more common than for mumps, rubeola, rubella and especially hepatitis B in applicants for healthcare jobs.

Immunology and Rheumatology I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

31 ALTERATIONS IN THE COLONIC MICROBIOME PRECEDE THE DEVELOPMENT OF RHEUMATOID ARTHRITIS

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10.1136/jim-d-15-00013.31

Purpose of Study Alterations in resident bacteria, termed dysbiosis, is present in patients in early stages of rheumatoid arthritis. It remains unclear if dysbiosis is causative or occurs as a result of the disease. Using the collagen-induced arthritis (CIA) model in mice and patients at risk for developing RA, we aimed to determine if microbiome changes occur and, if so, at what point during the development of disease.

Methods Used DBA1/j mice were injected intradermally with bovine type II collagen emulsified in complete Freund's adjuvant at days 0 and 21 to induce CIA. Fecal pellets were harvested from the mice at days 0, 21, and 39 after immunization. Patients from the Studies of the Etiology of RA who were CCP+ or CCP- without evidence of arthritis were recruited and fecal samples collected. The microbial DNA was extracted from feces and 16S rRNA sequencing was performed. Microbial ecology such as diversity and relative abundance of the 16S rRNA sequences was evaluated using Explicet software.

Summary of Results The mean severity of CIA at day 39 after immunization was 6.67±1.05; no mice had

observable arthritis before day 24. Our microbiome sequencing results demonstrate significant differences in the beta diversity of the microbial community at day 0 (1.000) compared to day 21 (0.866) and at day 39 (0.920). Alterations in the microbiome were concentrated in phylum *Firmicutes*, class *Clostridia*, and order *Clostridiales*. Interestingly, when comparing pre-clinical RA patients, we also observed enrichment in the same microbial order in CCP+ individuals compared to CCP–.

Conclusions These data indicate that dysbiosis occurs during the initial stages of CIA and RA, when immune responses that lead to disease are developing. Such findings suggest that dysbiosis may be causative in pathogenesis of disease rather than reflective of the disease presence. An interesting finding was the observation of the same order of bacteria in both preclinical CIA, in which CCP antibodies are present, and CCP+ individuals at risk for developing RA. Our future directions will focus upon the functional consequences of this bacterial order in driving the development of pathogenic anti-CCP autoantibodies.

32 TREATMENT OF IGG4-RELATED PACHYMENINGITIS IN A PATIENT WITH STEROID INTOLERANCE: THE ROLE OF EARLY USE OF RITUXIMAB

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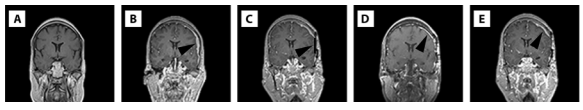
10.1136/jim-d-15-00013.32

Case Report: Importance IgG4-related pachymeningitis is a serious autoimmune condition that can present with symptoms of mass effect and related focal deficits. According to a general consensus on management of IgG4-related diseases, the first-line therapy is steroids and chemotherapy, such as methotrexate. We describe a patient with IgG4-related pachymeningitis in whom steroid use was contraindicated and methotrexate was ineffective.

Observations: A patient in her mid–50s with an aggressive form of IgG4-related pachymeningitis responded well to steroids; however, their continued administration was contraindicated due to her history of gastrointestinal surgery. Methotrexate dose was increased and continued for months with suboptimal response. During the course of her treatment, the patient presented to the emergency department with receptive and expressive aphasia, slurred speech, right-sided neglect, and loss of sensation. After a single infusion of rituximab and initiation of anticonvulsants, her symptoms resolved.



Abstract 32 Figure 1

Conclusions and Relevance: Although IgG4 disease generally responds well to steroids and chemotherapeutic agents, the clinician must always take into account the patient's individual circumstances. Should patients with aggressive forms of IgG4-related pachymeningitis be started on rituximab earlier? In this case, early rituximab might have been the most appropriate treatment under her circumstances.

Acknowledgements Dr Jun Wang, MD, Hematopathologist at Loma Linda University Medical Center.

A) Two years prior to diagnosis, coronal T1 with contrast of the brain demonstrating no enhancement in the left temporofrontal dura. B) Pachymeningeal enhancement (arrowhead). C)Post left temporal craniotomy for dural biopsy. D) Improvement of dural enhancement after prednisone. E) Recurrence of dural enhancement with worsening neurological symptoms while on methotrexate alone.

33 CLINICAL AND DEMOGRAPHIC FACTORS ASSOCIATED WITH FATIGUE IN SPONDYLOARTHRITIS

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10.1136/jim-d-15-00013.33

Purpose of Study Fatigue contributes substantially to quality of life in rheumatoid arthritis; however, its role in the spondyloarthritides remains poorly characterized. We evaluated the association of fatigue and functional status with clinical characteristics in patients with axial spondyloarthritis (axSpA) and psoriatic arthritis (PsA).

Methods Used Cross-sectional data from the Veterans Affairs Program to Understand the Long-term outcomes in SpondyloARthritis (PULSAR) were analyzed in order to determine associations between clinical characteristics and self-reported fatigue. The distribution of fatigue scores was examined using a measure of skewness and visually by histogram. We employed multivariable linear regressions to evaluate demographic, clinical, and laboratory factors for associations with fatigue, as measured in the first item of the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI). We also implemented the Bath Ankylosing Spondylitis Functional Index (BASFI) to evaluate the impact of fatigue on functional outcome.

Summary of Results The study cohort consisted of 251 individuals (104 with axSpA, 136 with PsA, and 11 with both diagnoses). The mean fatigue score was 6.15 (SD 2.59), with no evidence of skewing, but a ceiling effect was present. Elevated erythrocyte sedimentation rate (ESR) and current tobacco use, but not C-reactive protein concentration, were significantly associated with increased fatigue while higher educational level was associated with less fatigue, after controlling for numerous variables ($p<0.05$). Greater fatigue was also significantly positively associated with worse functional outcome.

Conclusions Fatigue is a major player in defining outcome for patients with axSpA and PsA and environmental factors such as education level and tobacco use, irrespective of age and race, are associated with more significant fatigue contributing to poorer functional status and overall poorer well-being. This has implications given the use of the BASDAI/BASFI as the core patient-outcome measures for determining therapeutic regimens for patients with axSpA.

34 DETERMINING THE ROLE OF THE TYK2 PROTECTIVE VARIANT P1104A IN INTERLEUKIN-12 SIGNALING AND HELPER T CELL TYPE 1 POLARIZATION

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10.1136/jim-d-15-00013.34

Purpose of Study The Tyk2 P1104A variant has been with has been associated with protection against rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), and multiple sclerosis (MS). Despite this connection, little has been done to determine how the variant influences the immune response. The purpose of the present study is to deepen our understanding of P1104A by focusing on one of its primary signaling pathways, specifically IL–12. The first part of our investigation will concentrate on the IL–12 receptor. Previous studies have implied that P1104A is responsible for decreased IL–12 signaling. However, the IL–12R is upstream of P1104A and on the same signaling pathway. Therefore, a defect in either could yield similar results. Our objective is to determine which component is actually responsible for decreased IL–12 signaling. Our second goal is to assess P1104A's effect on Th1 polarization in wildtype, heterozygous, homozygous, and knockout mice. Since IL–12 is the primary cytokine involved in Th1 differentiation and P1104A disrupts signaling, we should see a clear decrease in Th1 cells across the genotypes, e.g. wildtype will have the most and knockout the least. Elevated Th1 levels are associated with the autoimmune disorders mentioned above. Therefore, a decrease in Th1 cells due to P1104A would imply phenotypic protection.
Methods Used CD4+ splenocytes were purified via positive selection in each genotype. To measure IL–12R expression, T cells were stained with anti-IL–12R antibodies conjugated to fluorochromes. To measure downstream signaling, we stained with anti-pSTAT4. For Th1 polarization, CD4+ cells were skewed, stimulated, and stained with antibodies specific to cytokines. All samples were analyzed with flow cytometry.
Summary of Results IL–12R levels were similar in each genotype while pSTAT4 levels decreased across the genotypes - wildtype mice had the most and knockout the least. Based on cytokine production, Th1 cell counts decreased significantly - wildtype mice had the most Th1 cells while homozygous and knockout the least.
Conclusions Decreased IL–12 signaling is due to P1104A and not a defect in the IL–12R. The variant affects polarization by reducing Th1 levels, which may suggest protection against autoimmune disorders including RA, SLE, and MS.

35 SPUTUM IGG AND IGA ANTI-CYCLIC CITRULLINATED PROTEIN ANTIBODIES IN SUBJECTS AT RISK FOR RHEUMATOID ARTHRITIS

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Purpose of Study Serum anti-cyclic citrullinated protein (CCP) antibodies are specific for rheumatoid arthritis (RA) and are abnormally elevated in the serum years prior to the onset of inflammatory arthritis. As such, anti-CCP antibodies are hypothesized to originate at an extra-articular site. To test the hypothesis that anti-CCP is generated in the lung mucosa, we examine sputum levels of anti-CCP isotypes.
Methods Used We studied 28 patients with RA, 115 arthritis-free subjects at risk for future RA based on serum anti-CCP3.1 (IgG+IgA) positivity or familial RA, and 46 healthy controls. Simultaneously collected serum and induced sputum were tested by ELISA for isotype-specific anti-CCP-IgA, anti-CCP-IgG, and anti-CCP-IgM (Inova Diagnostics, research use only). For each CCP isotype, serum and sputum positivity was set based on levels present in <5% of controls.
Summary of Results We identified 20/28 (71%) RA and 31/115 (27%) At-Risk subjects with ≥1 sputum anti-CCP isotype positive. Sputum CCP-IgG positivity for RA subjects was significantly higher than CCP-IgA (71% vs. 39%, $p=0.02$), in contrast to At-Risk subjects, who demonstrated similar sputum CCP-IgG and CCP-IgA positivity rates (17% vs. 19%, $p=0.73$). Also, 22/115 At-Risk subjects had ≥1 sputum CCP isotype positive in the absence of serum CCP isotype positivity suggesting local generation in the lung. In At-Risk and RA subjects, sputum CCP-IgA was more prevalent in ever compared to never smokers (72% vs. 15%, $p<0.01$), and sputum CCP-IgA and CCP-IgG correlated with sputum absolute macrophage count ($p<0.01$).
Conclusions Anti-CCP-IgA and CCP-IgG are elevated in the lung of subjects At-Risk for future RA, whereas sputum CCP-IgG was more prevalent in established RA. This suggests that lung generation of CCP-IgA may be an important factor in early loss of tolerance. Moreover, the development of sputum CCP-IgG may be important in the transition to articular RA. Longitudinal studies are needed to explore possible contributing factors (including smoking) in the development of mucosal autoimmunity in RA.

36 LABORATORY ASSAYS FOR AIDING THE DIAGNOSIS OF CHRONIC URTICARIA

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10.1136/jim-d-15-00013.36

Purpose of Study To evaluate methods for the detection of basophil degranulation in suspected Chronic Idiopathic

Urticaria (CIU) patient's serum. CIU is defined as persistent hives lasting for at least six weeks. Approximately 40% of patients with CUI have an autoimmune antibody to the a subunit of the high affinity IgE receptor (FcεRIα) present on mast cells and basophils.

Methods Used The traditional basophil histamine release (BHR) assay, and two flow cytometric upregulation assays using either anti-CD203c or anti-CD63 antibodies for measuring basophil activation.

Summary of Results Sixty-one patient samples submitted for CIU testing (14 Male, 47 Female) were included in this study. The flow cytometric assays (CD203c vs CD69) had an overall agreement of 92.6%, positive agreement of 83.3%, and negative agreement of 100%. The CD63 flow assay compared better to the traditional BHR assay (agreement: overall 96.6%, positive 95%, negative 97.4%) than the CD203c vs BHR (agreement: overall 91.1%, positive 100%, negative 85.7%).

Conclusions The BHR assay compared well to the flow cytometric assays for determining basophil activation, but may be less specific for detecting anti- FcεRIα antibodies as other serum factors may cause basophil degranulation and histamine release. The upregulation of CD63 and CD203c on basophils requires the cross-linking of FcεRIα and has been more closely associated with anti-FcεRIα antibodies in CIU patients, thus making these assays more specific. Our study also showed that the flow cytometric assays reported more positive results than the BHR assay, indicating that it may be a more sensitive method for detecting basophil activation.

37 GRANZYME A IS INCREASED IN PLATELETS FROM OLDER ADULTS, LEADING TO IL–8 AND MCP–1 CYTOKINE SYNTHESIS BY TARGET MONOCYTES

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10.1136/jim-d-15-00013.37

Purpose of Study Aging is associated with injurious cytokine responses, and emerging evidence indicates that platelets have key functions in the inflammatory process. Yet, how aging alters the platelet molecular signature, causing dysregulated immune signaling remains unknown. We hypothesized that aging would be associated with alterations in the platelet molecular signature, enhancing signaling interactions with monocytes, leading to exaggerated MCP–1 and IL–8 synthesis.

Methods Used Platelets and monocytes were isolated from healthy adult subjects. RNA-seq was performed on isolated platelets via the Illumina platform. Primers were designed and validated for candidates and RNA expression determined by qRT-PCR. Granzyme A (GrA) antibodies were used for western blots and ICC. Cytokine synthesis was measured via ELISA. Commercially obtained recombinant GrA and anti-GrA blocking antibodies were used for in vitro experiments with platelets and monocytes.

Summary of Results Compared to younger adults (age<40), platelets from older adults (age>65) had numerous (>300) differentially expressed transcripts. Among the top candidates was GrA. Quantitative RT-PCR and western blot confirmed that GrA expression was significantly increased in platelets from older adults. In vitro, platelets and monocytes from older adults, when incubated together in autologous conditions, resulted in significantly higher synthesis of IL–8 and MCP–1. This was also demonstrated in a dose-dependent response with increasing concentrations of platelets. In switch experiments, where platelets from older adults were incubated with monocytes from younger adults (e.g. in non-autologous fashion), cytokine synthesis was also increased, indicating a platelet-dependent effect. The synthesis of these pro-inflammatory cytokines was augmented in the presence of recombinant human GrA. Blocking GrA rescued this exaggerrated pro-inflammatory cytokine synthesis.

Conclusions We report, for the first time, the expression of GrA in human platelets. GrA is increased in older adults and potentiates the release of inflammatory cytokines IL–8 and MCP–1 when added to platelet-monocytes. Taken together, these results imply a novel pathway through which platelets influence the inflammatory response.

38 TUMOR NECROSIS FACTOR-ALPHA (TNF-A) RESPONSE AND *MYCOBACTERIUM TUBERCULOSIS* (MTB) REPLICATION IN HSP90B1 KNOCKDOWN MACROPHAGES

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10.1136/jim-d-15-00013.38

Purpose of Study Toll-like receptors (TLRs) are innate receptors essential in mounting effective immune responses. Polymorphisms in TLRs and their intracellular signaling molecules are associated with clinical diseases. HSP90B1 is a chaperone for multiple client proteins including many of the TLRs. It has been shown in mice to chaperone and traffic TLRs 1, 2, 4, 6, 8, & 9 but not TLR3 and its abrogation in mice leads to immunodysregulation. Little is known about HSP90B1 in humans. Our lab identified SNPs in the HSP90B1 gene region that correlate with TB susceptibility in South African infants. Thus, we want to knockdown and assess how HSP90B1 regulates secretion of cytokines and MTB replication in human macrophages. Of particular interest to us is TNF-a cytokine which is involved in T-cell polarization and play a role in MTB pathogenesis. Our observations will yield insight into how TLR signaling can be therapeutically manipulated by adjuvants.

Methods Used We used CRISPR/Cas9 to knock down *HSP90B1* in a U937 human macrophage cell line. We infected macrophages with live Mtb for 18 hours and measured bacterial replication over a 144 hr time course. We used ELISA to measure TNFa secretion levels post stimulation with a panel of TLR ligands.

Summary of Results HSP90B1 knockdown was successful as shown by our RFLP and western blot analysis (Figure 1A&B in supplemental data). TLR2, 3 & 4 (agonist include Pam2/3 & Lipopolysacharide) mediated TNFa secretion was significantly reduced in HSP90B1 knockdown compared to positive control and non-manipulated WT [p<0.02](see figure 1C supplemental data). Similar observation for whole cell lysate which

stimulates multiple TLRs [p=0.01]. Our positive control/EV cell lines were CRISPR manipulated but lacked the knockdown of HSP90B1 gene due to non-specific targeting. Furthermore, Mtb replication assays did not reveal a difference in replication between HSP90B1 knockdown cells versus controls (data not shown).

Conclusions HSP90B1 affects TNF secretion upon macrophage stimulation with TLR ligands and thus may shape the quality and type of immune response to MTB. Although it does not appear to affects MTB kinetics in macrophages, it is nevertheless a promising target for therapeutic manipulation owing to its ability to orchestrate TLRs.

Infectious Diseases I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

39 USE OF ANTIBIOTICS IN TREATMENT OF CHILDREN DIAGNOSED WITH *ESCHERICHIA COLI* 0157:H7 DIARRHEA AND RISK OF DEVELOPING HEMOLYTIC UREMIC SYNDROME (HUS): REVIEW OF THE LITERATURE

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10.1136/jim-d-15-00013.39

Purpose of Study The use of antibiotics in diarrhea caused by *Escherichia Coli (E. Coli) 0157:H7* in the pediatric population remains contentious. The purpose of this review was to determine whether antibiotics increase the risk of HUS.

Methods Used PubMed and Google Scholar search engines were used to find studies that included children under the age of 21 and diagnosed with HUS caused by *E. Coli O157:H7*.

Summary of Results Eight studies regarding the use of antibiotics in children with possible signs of HUS satisfied our inclusion criteria (see tables below for prospective and retrospective studies). Although there were conflicting results, majority of studies with larger sample size showed giving antibiotics increased the risk of HUS. Severity of disease, starting antibiotics early during diarrheal phase and bactericidal antibiotics were associated with increased risk of HUS.

Conclusions Studies which included larger sample size have shown an increased risk of HUS after use of antibiotics. Severity of illness, the type of antibiotic and duration of symptoms before start of antibiotics may influence the risk of developing HUS.

40 HIV TESTING, STATUS, AND TREATMENT AMONG PATIENTS AT THE UGANDA CANCER INSTITUTE

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10.1136/jim-d-15-00013.40

Purpose of Study HIV increases the incidence and mortality of cancer; knowledge of HIV status and treatment is essential for management of patients with HIV-associated malignancies (HIVAM). In Uganda, where prevalence of HIV infection is >7%, the incidence of AIDS-defining cancers (ADCs) -including Kaposi sarcoma, Non-Hodgkin lymphoma, and cervical cancer- is high, and Non-AIDS

Abstract 39 Table 1 Prospective Studies

Author and Year	Age of Patients (yrs)	Total	Antibiotics used	Those got antibiotics & developed HUS	Those without antibiotics & developed HUS	Effect of Antibiotics (Success, Harm)	P values
Wong CS, 2000	<18	71	Variety of Antibiotics	5/9 (56%)	5/62 (8%)	Harm	p<0.001
Wong CS, 2012	<18	259	ampicillin, azithromycin,cefotaxime, and trimethoprim-sulfamethoxazole	9/25 (36%)	27/234 (12%)	Harm	p=0.001
Geerdes-Fenge HF, 2013	<18	24	Ciprofloxacin Cefotaxime, amoxicillin, metronidazole	4/7 (57%)	15/17 (88%)	No Effect	p=0.12
Proulx, 1992	<21	77	Cotrimoxazole	2/22 (9%)	4/25 (16%)	No Effect	p=0.67

Abstract 39 Table 2 Retrospective Studies

Author and Year	Age of Patients (yrs)	Total	Antibiotic Name	Patients treated with antibiotics & developed HUS	Patient treated without antibiotics & developed HUS	Effect of Antibiotics (Success, Harm	P values
Ostroff, 1989	<10 Subgroup	75	Erythromycin, ampicillin, and cotrimoxazole	3/8 (38%)	5/12 (22%)	No to minor Effect	p=0.07
Beth P. Bell, 1997	<15	278	TMP/SMZ, Ampicillin or Amoxicillin, Cephalosporin, Metronidazole	8/50 (16%)	28/128 (22%)	No Effect	p=0.56
Pavia, 1990	<20	23	Cotrimoxazole, sulfonamide	5/8 (72%)	0/7 (28%)	Harm	p<0.05
Smith KE, 2012	<20	188	Bactericidal antibiotics	12/63 (19%)	6/125 (5%)	Harm	p<0.01

defining cancers (NADCs) are increasingly common among HIV-infected (HIV+) persons. We determined how often cancer providers documented the HIV status and clinical parameters of HIV infection among patients presenting at the Uganda Cancer Institute (UCI), the primary cancer treatment facility for a catchment area of 100 million.

Methods Used Medical records of patients aged ≥18 who registered at the UCI between May–August 2015 were abstracted for demographics, cancer and HIV parameters. We calculated binomial proportions and used χ^2 tests and logistic regression to evaluate factors associated with HIV testing, HIV-positivity, and antiretroviral therapy (ART) usage.

Summary of Results Among 556 patients, 30% had a potential ADC. 67.8% of charts documented HIV status. Of those with documented HIV status, 137 (36%) were HIV+, and 58% of HIV+ individuals had an ADC. The documented HIV prevalence in NADCs was 24%. Men were 1.75-fold more likely to be HIV positive (95% CI 1.15–2.68, p=0.009), however, women were more likely to have undocumented HIV status (RR 1.32, p=0.009). Women accounted for 54.6% of all patients; 36% of women lacked HIV test results, including 40% with cervical cancer. 62% of HIV+ patients had a CD4 count recorded. The median CD4 count among persons with ADCs was 300 cells/ml (interquartile range 114–395) compared with NADCs (median 353, IQR 185–601), p=0.08. There was no difference in the proportion of HIV patients receiving ART prior to UCI registration between those with ADC vs. NADC (86%), p=0.45.

Conclusions HIV prevalence was 5 times higher in Ugandan cancer patients with a documented status than in the general population. Though the majority of cancer patients had a known HIV status, gaps remained in documenting HIV status, CD4 count and ART usage, even among patients with ADCs. This study highlights opportunities to educate cancer clinicians in Africa on the burden of HIV in cancer patients and the importance of managing both diseases in patients with HIVAM.

41 NON-TYPE B *HAEMOPHILUS INFLUENZAE* PYOGENIC ARTHRITIS IN CHILDREN

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10.1136/jim-d-15-00013.41

Purpose of Study Non-type B *Haemophilus influenzae* (NTBHI) serotypes have been increasingly recognized as a cause of invasive disease since the introduction of routine vaccination for *H. influenzae* serotype B (Hib). We present 10 cases of NTBHI pyogenic arthritis in children with a concurrent systematic review of the literature.

Methods Used Otherwise healthy children discharged between March 1st 2003 and March 1st 2014 from our institution were retrospectively assessed for a diagnosis of pyogenic arthritis utilizing 40 different ICD–9 codes. Children <18 years of age were required to demonstrate imaging or operative findings consistent with the diagnosis, a compatible clinical course and exclusion of alternative diagnoses. Each subject's entire medical record was reviewed. A systematic literature review was performed utilizing combinations of 7 MeSH terms with sequential review of references from relevant publications. Comparison of means was undertaken with the Welch-Satterthwaite equation.

Summary of Results 427 subjects were identified, with 116 meeting inclusion criteria. Organisms were isolated on culture in 75.5% of subjects. We identified 10 cases of pyogenic arthritis secondary to NTBHI in our population (5 boys). 8 *H. influenzae* type A, 1 *H. influenzae* type F and 1 nontypable strain were present, making NTBHI the third most common identifiable pathogen (as a group) in our population, behind *S. aureus* and *S. pyogenes*. The ankle was the most commonly involved joint in subjects with NTBHI infection (70.0% vs. 21.7% for subjects without NTBHI, p=0.006). Subjects with NTBHI were also younger (range 0.8 to 6.3 years, mean age of 2.1 years) than subjects without NTBHI infection (range 0.1 to 17.0 years, mean age of 6.3 years, p<0.001), and more commonly Native American (50.0% vs. 23.6%, p=0.08). Our literature review produced only 8 individual cases of NTBHI pyogenic arthritis over the last 23 years.

Conclusions Though few cases of pyogenic arthritis secondary to NTBHI are described in the literature, NTBHI was the third most common identifiable organism (as a group) in our population. NTBHI may be an underrecognized cause of pyogenic arthritis in children, particularly in younger Native Americans.

42 ROLE OF IGG SUBCLASSES IN MUCOSAL DEFENSE OF *STREPTOCOCCUS PNEUMONIAE*

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10.1136/jim-d-15-00013.42

Purpose of Study Two vaccines available to prevent infections with the bacterial pathogen, *Streptococcus pneumoniae*, may elicit different immunological responses, particularly in the lung, the primary site of pneumococcal infections. Although both contain capsular polysaccharides, the 13-valent Pneumococcal Conjugate Vaccine (PCV13) demonstrated clinical protection against pneumonia in older adults, whereas the 23-valent Pneumococcal Polysaccharide Vaccine (PPSV23) does not. Differences in the predominant subclasses of IgG (IgG_1 and IgG_2) elicited by the two vaccines and preferential transfers of subclasses across the epithelial layer into the lungs may underlie the differences in efficacy.

Methods Used We vaccinated 11 healthy adults with varying smoking status and characterized bronchial alveolar lavage fluids (BAL) and blood samples. Using enzyme linked immunosorbent assays, the quantities of IgG_1 and IgG_2 in these samples were measured before and after vaccination.

Summary of Results Serum and BAL fluids with PPSV23 vaccination contained an increased level of both IgG_1 and IgG_2. In the serum, the ratio of capsular polysaccharide-specific IgG_2:IgG_1 demonstrates a higher level of IgG_2 relative to IgG_1 both before and after vaccination (62.1 and 35.7, respectively). After vaccination, the ratio of capsular polysaccharide specific IgG_2:IgG_1 is decreased by 43% in

serum while in the BAL fluids the ratio of total IgG_2:IgG_1 is increased by 43% (0.105 to 0.150).
Conclusions We conclude that despite a predominance of specific IgG_2 prior to vaccination, PPSV23 elicits a more robust IgG_1 response relative to IgG_2 in the serum. The decreased of IgG_2 relative to IgG_1 in the BAL fluids may support an increased selective transport for IgG_1 from serum across the epithelial layer to the lungs where pneumococcal pneumonia begins and antibody defense is most important.

43 USE OF ANTIBIOTICS RESERVED FOR RESISTANT GRAM-NEGATIVE INFETIONS AT FREE-STANDING US CHILDREN'S HOSPITALS FROM 2004 TO 2014

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10.1136/jim-d-15-00013.43

Purpose of Study Rates of antimicrobial resistance among Gram-negative infections have increased, but patterns in the use of broad-spectrum and older, more toxic antibiotics reserved for the treatment of these infections remain undefined in children. We assessed trends in the use of such reserved antibiotics in children over the past 11 years.
Methods Used We performed a retrospective study of 30 hospitals in the Pediatric Health Information System (PHIS) database from 2004 to 2014. We defined reserved antibiotics as carbapenems, colistin, polymyxin B, tetracycline, tigecycline, minocycline, fosfomycin, and amikacin. Incidence rates of therapy were calculated per calendar year and reserved antibiotic. Negative binomial regression was used to measure incidence rate changes over time. A nested case-control design and conditional logistic regression were used to identify risk factors for reserved antibiotic receipt compared to receipt of non-reserved antibiotics.
Summary of Results On average, the incidence rate of reserved antibiotic use increased by 2.3% annually (incidence rate ratio [IRR] 1.023, 95% confidence interval [CI] 1.02–1.03); however this represented an increase between 2004 and 2007 and a decrease thereafter. Only use of minocycline and tigecycline increased consistently during the study (IRR 1.18 [95% CI, 1.15–1.21] and 1.48 [95% CI, 1.36–1.60], respectively). Severity of illness on admission and underlying medical conditions were the strongest predictors for receiving a reserved antibiotic.
Conclusions Overall, use of reserved antibiotics did not increase consistently during the study period. This may be related to antimicrobial stewardship activities. Minocycline and tigecycline are potential targets for pediatric antimicrobial stewardship programs.

44 CYTOTOXIC FUNCTION OF ANTIBODIES PRODUCED BY HIV-SPECIFIC B-CELLS IN AN INFECTED INFANT

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10.1136/jim-d-15-00013.44

Purpose of Study With ~3.2 million new infections and 35 million infected individuals in 2013, HIV–1 remains a serious global health challenge. Despite recent advances in treatments for HIV–1 infection, lack of access and adherence are issues that demand a strategy that can provide protection against infection, such as a vaccine. Antibodies are the main correlate of protection in licensed vaccines. In the context of HIV–1 infection, antibodies provide protection by neutralizing cell-free virus or inducing natural killer cell-mediated death of infected cells in a process known as antibody-dependent cellular cytotoxicity (ADCC). HIV-specific ADCC antibodies have been correlated with better infant outcomes and are thus of particular interest. In this study, we sought to isolate HIV-specific antibodies from an infected infant and determine if any were capable of mediating ADCC.
Methods Used HIV-specific B-cells were isolated from infected infant plasma by sorting B-cells that bound to a well-characterized HIV envelope trimer. Antibodies produced by HIV-specific B-cells were cloned, purified, and tested in a rapid-fluorometric ADCC assay. In brief, cells were stained with both a membrane and cytosolic dye, coated with HIV envelope monomer, and exposed to antibody in the presence of PBMC effector cells. ADCC activity was calculated by determining the number of cells that lost cytosolic dye as a result of ADCC activity. An ELISA assay was used to assess binding of isolated antibodies to HIV envelope monomer.
Summary of Results Among 11 antibodies that were cloned from 17 trimer-specific B-cells, 1 neutralized HIV with significant potency but limited breadth. However, none of these antibodies mediated ADCC within a range of expected optimal concentrations (0.5–5000 ng/mL). Among the 10 that did not neutralize virus or mediate ADCC, there was also not detectable binding to the HIV envelope monomer.
Conclusions In summary, we utilized an innovative approach to isolate HIV-specific B-cells from infected infant plasma. Despite being isolated by virtue of binding HIV trimer, these B-cells did not produce antibodies that mediated ADCC and most were not capable of neutralizing HIV. These results are valuable in designing future strategies to isolate HIV-specific B-cells that produce ADCC-mediating antibodies.

Neonatal Pulmonary I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

45 NEONATAL LUNG EXPRESSION OF IL–1 ALPHA IN RESPONSE TO SYSTEMIC INFLAMMATION

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10.1136/jim-d-15-00013.45

Purpose of Study Exposure to inflammatory stress is an independent risk factor for developing bronchopulmonary dysplasia. However, the molecular mechanisms linking inflammation to impaired lung development are unknown. Both IL–1 alpha (IL–1a) and IL–1 beta (IL–1b) induce

inflammation by binding the IL–1 receptor. Importantly, IL–1 receptor antagonism attenuates lung injury and abnormal lung development in neonatal animals exposed to inflammatory stress. While many studies have linked IL–1b to BPD development, little is known about inducible IL–1a expression. The objective of our study was to determine whether systemic inflammatory stress induces IL–1a expression in the neonatal lung, and if so, whether this occurred via an NFkB dependent mechanism.

Methods Used Both adult (6–10 wks) and neonatal (P0) WT mice were exposed to endotoxemia (IP LPS, 5 mg/kg, 2–6 hrs). Pulmonary and hepatic IL–1a expression were assessed by RT-qPCR and immunoblot. The role of NFkB in regulating inducible IL–1a expression was assessed using genetic and pharmacologic approaches to inhibit NFkB activity in isolated macrophages.

Summary of Results Endotoxemia induced both IL–1a mRNA (150 fold, $p<0.05$) and protein expression in the neonatal lung, an effect not observed in the neonatal liver or the adult lung. Induction of IL–1a expression was temporally associated with pulmonary NFkB activation, determined by cytosolic degradation of NFkB inhibitors and nuclear translocation of the NFkB subunit p65. In isolated macrophages, pharmacologic (BAY 11–7085) and genetic (IkBa over-expression) inhibition of LPS-induced NFkB activation attenuated IL–1a expression ($p<0.05$). Finally, silencing expression of the NFkB inhibitory proteins IkBa and IkBb significantly increased IL1a expression ($p<0.05$).

Conclusions Together these results suggest that in the neonatal lung, inducible IL–1a expression occurs via and NFkB dependent mechanism. Due to the profoundly pro-inflammatory effect of Il–1a, we speculate that pulmonary Il–1a expression may uniquely contribute to the pathogenesis of BPD. Better characterization of the mechanisms leading to IL–1a induced lung injury may lead to new therapies for BPD.

46 YAP-HIPPO VASCULAR SIGNALING DRIVES LUNG MORPHOGENEIS AND IS DYSREGULATED IN HYPEROXIA-INDUCED NEONATAL LUNG INJURY

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10.1136/jim-d-15-00013.46

Purpose of Study To determine temporal expression of Yap-Hippo signaling pathway in rodent lung morphogenesis and the role in pulmonary endothelial cells (PEC)-specific Yap-Hippo signaling in hyperoxia-induced neonatal lung injury.

Methods Used Mouse lungs from embryonic (E) stages 14.5 through postnatal day 0 (PN0) were assessed to profile YAP-Hippo developmental gene expression. Mouse primary pulmonary endothelial cells (PECs) were exposed to normoxia (21%O2) or hyperoxia (40% or 95% O2) for 24 hr with and without Yap1 silencing (siRNA) or rescue of Yap1 silencing with overexpression of constitutive Yap1 (Yap1 transfection) to evaluate hyperoxia effect on PECs. Expression of Yap-Hippo pathway intermediates, total and phosphoYap1, AMOT, and WWTR1, and angiogenesis indices were evaluated. Mouse lung explants postnatal day (PND)1 subjected to 21%, 40% or 95% O2 for 24 hr, and probed for AMOTL1, AMOTL2, Yap1, AMOT 80, Amot 130, and WWTR1 by qRT-PCR. PND 1 neonatal mice exposed to 21% or 95% O2 for 24 hrs, and assessed for YAP1 activation. Lung sections from human infants dying with BPD were probed for Yap1 activation.

Summary of Results Expression of YAP-Hippo signaling intermediates shows a developmental-dependent increase in Yap-Hippo signaling early in gestation, and decrease with increasing gestation. Hyperoxia-induced activation of YAP1 and its transcriptional co-regulator WWTR1 is altered expression of AMOT, AMOTL1 and AMOTL2, all known regulators of YAP localization and activation. Hyperoxia specifically activated PEC Yap–1, which increased, but defective angiogenesis. Lung section of human infants dying with BPD corroborates PEC-specific Yap1 activation.

Conclusions We conclude that hyperoxia-induced aberrant Yap-Hippo signaling leads to pulmonary dysangiogenesis and blunted alveolarization in BPD, and can be exploited to test novel therapeutic targets against BPD.

47 CORRECTION FOR ALTITUDE SIGNIFICANTLY CHANGES REPORT RATES FOR BRONCHOPULMONARY DYSPLASIA

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10.1136/jim-d-15-00013.47

Purpose of Study Bronchopulmonary dysplasia (BPD) is defined as a need for >21% supplemental O2 at 36 weeks corrected gestational age (CGA) for infants born less than 32 weeks. Recent reports suggest increased BPD risk if cared for at elevated altitudes (Lee *et al*, *Am J Perinatol* 2013; Al-Shehri, *J Trop Paediatr* 2014). Lower O2 saturations observed at high altitudes due to lower O2 partial pressure may contribute to this risk. Our objective was to assess the effect on BPD rates following altitude correction for effective FiO2 in high risk preterm infants.

Methods Used This is a retrospective review of prospective data on neonates <30 weeks GA at University of Utah NICU from 1/2010–8/2015. BPD was defined at 36 weeks CGA based on O2 reduction test with lower O2 saturation goal of 92%. Effective FiO2 was determined at 36 weeks PMA based on weight, cannula flow rate and FiO2 using Benaron and Benitz's equation (Arch Pediatr Adolesc Med, 1994). We performed altitude correction via the ratio of average barometric pressure (BP) in our unit of 640 (BP at 5000 feet) to 760 (BP at sea level), a value of 0.84. Thus, in our unit O2 partial pressure is equivalent to sea level FiO2 of 0.177, while FiO2 of 0.249 is equivalent to room air O2 partial pressure at sea level.

Summary of Results 528 neonates were identified (EGA 27+/–2 weeks, BW 992+/–331g). BPD rate was inversely proportional to EGA (Table). There was a significant decrease in rates of BPD and BPD-or-Death ($p<0.001$) following altitude correction for all gestation groups. Of those diagnosed with BPD, 176/327 (53.8%, $p<0.001$) did not meet diagnostic criteria after adjustment. Relative decrease in BPD rate increased with EGA.

Abstract 47 Table 1

EGA (wks)	23–24	25–26	27–29	All
BPD, n (%)	61 (95)	98 (82)	168 (60)	327 (70)
BPD after correction, n (%)	47 (73)	52 (43)	52 (18)	151 (32)
BPD or death, n (%)	87 (97)	111 (84)	194 (64)	392 (74)
BPD or death after correction, n (%)	73 (81)	65 (49)	78 (26)	216 (41)
Decrease in BPD rate*	23%	47%	69%	54%

*P<0.02.

Conclusions BPD is common in high risk preterm infants. Using the standard definition, high altitude is associated with significantly increased rates of BPD. At our altitude, the rate of BPD was two-fold lower following FiO2 correction for altitude. Further diagnostic criteria to adjust for altitude seems warranted.

48 TARGETED INVESTIGATION OF NOVEL MESENCHYMAL STEM CELL BIOMARKERS OF BRONCHOPULMONARY DYSPLASIA IN PREMATURELY BORN INFANTS

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10.1136/jim-d-15-00013.48

Purpose of Study Bronchopulmonary dysplasia (BPD) is a chronic disease of preterm infants caused by oxygen toxicity, inflammation, and ventilator use leading to arrested alveolar development. Current therapies lack effectiveness and cause undesirable side effects. Our work has shown mesenchymal stem cell conditioned-media to have protective effects in mouse BPD models. Analysis identified Osteopontin (Spp1) and Macrophage colony stimulating factor 1 (Csf1) as key factors to suppress the TGF-B surge in the lungs, leading to protection against BPD. Our pilot study has shown it to be feasible to quantify Spp1, Csf1, and TGF-B in the tracheal aspirate fluid (TAF) of preterm infants and generated standard curves. Our aim is to determine the association between Spp1 and Csf1 and BPD by quantifying these markers in the TAF of preterm infants.
Methods Used Infants under 32 weeks gestational age intubated within 24 hours of life were enrolled into the UCI IRB-approved study. Those with neuromuscular or congenital anomalies or pulmonary hemorrhage were excluded. The 1st TAF sample was obtained at intubation, before surfactant dosing. The 2nd was obtained at extubation or the 4th day if still intubated. Spp1, Csf1, TGF-B, and IgA levels were analyzed using ELISA. IgA was used as control to correct for TAF volume. Infants were followed prospectively for outcomes data including the development of BPD.
Summary of Results 21 infants were enrolled and TAF obtained. Subjects were similar in their maternal and neonatal characteristics. Half of the samples have been analyzed. Processing of the remaining samples and collection of outcomes data is ongoing. Standard curves were used from the pilot study. Approximately half of the subjects have developed BPD and demonstrated low baseline Csf1 levels and rising TGF-B levels post-ventilation. The subjects without BPD had stable Spp1, Csf1, and TGF-B levels.
Conclusions Levels of Spp1, Csf1, and TGF-B are associated with BPD. Further data collection is underway to reach study power. Statistical analysis will follow completion of sample processing. Larger multi-center studies are needed to confirm this association, which will guide targeted therapy against BPD.

49 NEONATAL HEPATIC COX2 EXPRESSION IS MEDIATED VIA AN NFκB-DEPENDENT MECHANISM FOLLOWING INFLAMMATORY STRESS

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10.1136/jim-d-15-00013.49

Purpose of Study Patent Ductus Arteriosus(PDA) occurs commonly in preterm neonates and is associated with numerous severe co-morbidities. Exposure to chorioamnionitis and early-onset sepsis are risk factors for PDA; additionally, prostaglandin byproducts are elevated in the serum of infants with PDA. However, the mechanisms linking inflammatory stress and PDA are unknown. COX2 is an inducible enzyme responsible for prostaglandin production. The cellular source and transcriptional regulation of COX2 following inflammatory stress in neonates are unknown. We hypothesize that the transcription factor NFκB regulates inflammatory-stress induced COX2 expression in neonates.
Methods Used Fetal (E15, E19) wild type mice were exposed to intrauterine LPS (250 μg); neonatal(P0) and adult wild type mice were exposed to IP LPS (5 or 50 μg/g). COX2 expression was assessed by qPCR. The time course of LPS-induced hepatic NFκB activation was determined using Western blot to assess NFκB inhibitory protein degradation and NFκB subunit nuclear translocation. COX2 expression in isolated neonatal and adult hepatic macrophages and adult livers following clodronate-induced macrophage ablation was assessed by qPCR. COX2 expression in cultured macrophages and in neonatal livers following NFκB inhibition was assessed by qPCR. All experiments were performed in triplicate.
Summary of Results Hepatic COX2 expression was induced in fetal, neonatal, and adult mice following LPS exposure. COX2 expression was enriched in isolated neonatal and adult hepatic macrophages and attenuated in adult livers following macrophage ablation by clodronate. Cultured macrophages demonstrated LPS-induced NFκB activation and COX2 expression and attenuated COX2 expression following NFκB inhibition. Neonatal and adult mice demonstrated hepatic LPS-induced NFκB activation. Pharmacologic NFκB inhibition in neonatal mice attenuated hepatic LPS-induced COX2 expression.

Conclusions Following systemic inflammatory stress, COX2 expression is induced in hepatic macrophages via an NFκB-dependent mechanism. We speculate that perinatal inflammatory stress may contribute to PDA through NFκB-dependent COX2 induction and subsequent prostaglandin synthesis. Thus, therapies targeted towards NFκB inhibition may prevent PDA in the setting of inflammatory stress.

50 EFFECT OF ELECTRO-ACUPUNCTURE ON OFFSPRING LUNG DEVELOPMENT FOLLOWING NICOTINE EXPOSURE DURING PREGNANCY AND LACTATION

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10.1136/jim-d-15-00013.50

Purpose of Study Pregnant women who smoke or are exposed to environmental tobacco smoke predispose the offspring to many adverse consequences including altered lung development and function. Despite intense research over decades, still there are no effective therapeutic interventions to block the effect of smoke exposure during pregnancy. Clinical and animal studies have demonstrated that acupuncture can modulate a variety of body's homeostatic responses and disease processes, including the development of respiratory system; however, whether acupuncture has a protective effect on the lung damage caused by perinatal smoke exposure is not known.

Methods Used To determine the effect of electro-acupuncture (EA) on perinatal nicotine exposure on the developing lung, 12 pregnant rats after 3 days ofPla fertilization were randomly divided into four groups: (1) Saline only control; (2) Saline+EA control; (3) Nicotine only; and (4) Nicotine+EA group. Nicotine was administered s.c. in 100 μl once a day and EA was applied to both "Zusanli" (ST 36) points, from embryonic day 6 of gestation to until the offspring were born at term, and then continued up to postnatal day 21, when rats were sacrificed and lungs harvested for further analysis. Using Western analysis, q-RT-PCR, ELISA, and morphometery, markers of lung differentiaiton (PPARγ, surfactant protein (SP)-B and -C) and injury repair [TGF-β activation (Smad3 and ALK5), apoptosis (BcL2/Bax); inflammatory cytokines (IL–6 and IL–1β) were determined. Plasma levels of hypothalamic corticotropin releasing hormone (CRH) were also measured.

Summary of Results Concomitant EA application blocked nicotine exposure-induced changes in lung morphology and markers of lung injury repair (TGF-β activation, increased apoptosis, bronchoalveolar lavage PPARγ, SP-B and -C, and inflammatory cytokine levels, as determined by Western analysis and ELISA). Decrease in plasma CRH level also normalized.

Conclusions Electro-acupuncture stimulates feto-neonatal lung maturation and blocks nicotine-induced lung injury, promting us to conclude that EA is a promising intervention against smoke exposed lung damage to the developing lung [Grant Support NIH (HD51857, HD071731) and the TRDRP (17RT–0170, and 23RT–0018)].

51 TREATMENT WITH AN ANTI-SFLT–1 MONOCLONAL ANTIBODY IMPROVES LUNG STRUCTURE AND PREVENTS PULMONARY HYPERTENSION IN AN EXPERIMENTAL MODEL OF BRONCHOPULMONARY DYSPLASIA DUE TO PREECLAMPSIA IN INFANT RATS

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10.1136/jim-d-15-00013.51

Purpose of Study Bronchopulmonary dysplasia (BPD), the chronic lung disease that follows respiratory and oxygen therapy of preterm infants, is characterized by abnormal lung structure due to impaired alveolar and vascular growth. Antenatal factors, such as preeclampsia (PE), are strongly associated with an increased risk for BPD, which may be due to increased soluble Flt–1 (sFlt–1; an endogenous VEGF inhibitor). Past studies have shown that a rat model of PE caused by intra-amniotic (IA) instillation of sFlt–1 decreases alveolar and vascular growth and causes pulmonary hypertension (PH) in infant rats. We hypothesized that antenatal or postnatal treatment with a specific anti-sFlt–1 monoclonal antibody (MAb) would preserve normal lung growth and prevent PH in experimental PE.

Methods Used To address this hypothesis, we studied the effects of anti-sFLt–1 MAb treatment on lung structure and PH in infant rats after exposure to sFlt–1 or saline (controls) by IA instillation at 20 days gestation (E 20). Anti-sFlt–1 Mab (1.5 or 15 ug/sac) or saline (controls) were administered by IA instillation immediately after sFl-t or saline treatment. Rat pups were delivered by C-section 2 days later (E 22). Animals were killed at 2 weeks of age for studies. Lungs were inflated and fixed with 4% paraformaldehyde for histology. Alveolarization was assessed by radial alveolar counts (RAC). Right ventricular hypertrophy (RVH) was assessed as the ratio of RV to left ventricle plus septum weights.

Summary of Results We found that at 2 weeks of age, sFlt–1 treated rats had reduced RAC by 45% and increased RVH by 50% ($p<0.01$ vs. controls for each value). Concurrent antenatal treatment with low dose anti-sFlt–1 Mab preserved RAC and prevented RVH ($p=NS$ vs. saline controls). In addition, postnatal anti-sFlt–1 Mab (10 mg/kg, daily subcutaneous injections) without antenatal treatment improved RAC and RVH after IA sFlt–1 exposure to control values.

Conclusions These findings suggest that anti-sFLt–1 MAb treatment preserves normal lung structure and prevents PH in a model of BPD. We speculate that anti-sFlt–1Mab therapy may provide a novel strategy for the prevention and treatment of BPD in the setting of PE.

52 LARYNGEAL MASK AIRWAY FOR SURFACTANT ADMINISTRATION IN NEONATES

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10.1136/jim-d-15-00013.52

Purpose of Study Continuous positive airway pressure (CPAP) is now a primary therapy for Respiratory Distress Syndrome. Infants who traditionally would have been intubated and given surfactant via an endotracheal tube are now maintained on CPAP without surfactant, a medication with clear short and long term therapeutic benefit. Currently, endotracheal tube placement is required for surfactant administration. We studied an alternative device, the laryngeal mask airway (LMA), for surfactant administration. We hypothesized that infants who received surfactant via an LMA and returned to CPAP would have a decreased need for intubation and mechanical ventilation as compared to those who were maintained on CPAP and did not receive surfactant.

Methods Used Multi-center, randomized controlled trial. Infants 28 0/7–35 6/7 weeks gestation, ≥1250 grams and ≤36 hours old requiring 0.30–0.40 oxygen on CPAP were randomized to the LMA Group (surfactant delivered through the device then placed back on CPAP) or Control Group (maintained on CPAP with no surfactant administered). Treatment failure necessitating intubation and mechanical ventilation in the first 7 days of life was defined a priori and compared between groups.

Summary of Results Analysis of 103 infants showed that surfactant administration via an LMA significantly decreased the need for intubation and mechanical ventilation as compared to controls (39% vs 64%, OR 0.32 (0.14, 0.76), p=0.01).

Conclusions The LMA can be used successfully to administer surfactant and prevent the need for intubation and mechanical ventilation in this group of infants.

Neonatology General I
Concurrent Session
12:30 PM
Thursday, January 28, 2016

53 THE SPLANCHNIC-CEREBRAL OXYGENATION RATIO DECREASES DURING FEEDINGS IN ANEMIC PRETERM INFANTS

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10.1136/jim-d-15-00013.53

Purpose of Study Anemia is a common problem in very low birth weight (VLBW) premature infants in the neonatal intensive care unit. Due to the potential risks associated with red blood cell transfusions, many anemic VLBW infants are managed without transfusions. The implications of this pathophysiologic status, especially at times of increased metabolic demand (enteral feedings), is not well understood. Near Infrared Spectroscopy (NIRS) allows for continuous non-invasive determination of regional oxygen saturations (rSO_2) in body tissues such as the brain and mesentery, giving insight into the oxygen sufficiency of tissues.

We hypothesize that VLBW infants with a hematocrit (hct) ≤28% will have decreased splanchnic rSO_2 and splanchnic-cerebral oxygenation ratio (SCOR) during enteral feedings.

Methods Used We included VLBW infants (birthweight<1500g) in stable clinical condition with hct ≤28%. Cerebral and splanchnic rSO_2 were continuously measured using NIRS (Invos 5100c Covidien) for 24 hours. Average values were calculated for the 30 minute period before (baseline), and for the duration, of each feeding (6–8 feedings/patient). SCOR was calculated from these values.

Summary of Results Fifty VLBW neonates (27 males) with a median gestation age of 28 weeks (23–32), and a mean birth weight of 1118±284g were included. All infants were on full volume enteral feedings (140±15 ml/kg/day). Mean age at the time of study was 46±12 days of life and mean hct was 26±2%. No patients developed NEC during their hospital stay. Data was analyzed using a linear mixed effects model.

Abstract 53 Table 1 NIRS RESULTS

	Baseline mean±s.d.	Feedingmean±s.d.	p Value
rSO2 - Cerebral	66±7	66±7	0.6
rSO2 - Splanchnic	47±10	45±10	0.057
SCOR	0.72±0.2	0.69±0.2	**0.044***

*p<0.05.

Conclusions Our study demonstrates that VLBW infants with hct ≤28% exhibit a significant decrease in SCOR and a trend to decreased splanchnic rSO_2 during enteral feedings. This is in contrast to a prior study of VLBW infants without anemia (hct >32%) which demonstrated increased SCOR and splanchnic rSO_2 during enteral feedings. We speculate that the decrease in splanchnic oxygenation during times of increased metabolic demand could predispose anemic VLBW infants to develop necrotizing enterocolitis.

54 BLEEDING RISK FACTORS IN NEONATES RECEIVING FISH OIL FOR INTESTINAL FAILURE ASSOCIATED LIVER DISEASE

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10.1136/jim-d-15-00013.54

Purpose of Study Prematurity, intestinal failure associated liver disease (IFALD), and operations (OP) are bleeding risk factors. Intravenous fish oil (FO) is associated with reversal of IFALD. FO is composed of omega-3 fatty acids, which

Abstract 54 Table 1

	Cases	Controls	p-value
	Baseline		
Gestational Age (wks)	32±2	33±2	0.7
Parenteral kcal/kg/d	96±3.5	80±7.7	0.2
DB (mg/dL)	9±2.3	7±1.1	0.7
ALT (IU/L)	116±27	95±19	0.6
Platelets (K)	219±44	161±22	0.2
	At OP		
Age (days)*	99±9	132±17	0.2
DB (mg/dL)	10±2.6	3±1.2	0.1
ALT (IU/L)	169±50	66±13	0.3
Platelets (K)	180±58	207±14	0.3

Mean±SEM. Wilcoxon rank sum used for statistics. *T-test used.

can impair platelet function and increase bleeding risk. This study's objective is to determine risk factors for bleeding in neonates with IFALD who received FO and underwent an OP.

Methods Used This is a case control study. Inclusion criteria: gastrointestinal disorder/intestinal failure, direct bilirubin (DB) > 2 mg/dL, received FO (IND 105,326), and an OP. Cases developed significant bleeding after an OP, while controls did not.

Summary of Results Baseline characteristics and liver function tests were comparable between cases (n=4) and controls (n=5). Compared to controls, cases had a decreased mean (±SEM) DB difference (0.7±0.7 vs. –4±0.6 mg/dL, p=0.048) and DB change (0.08±0.07 vs –0.4±0.1 mg/dL/wk, p=0.048). Cases had co-morbid conditions (chronic thrombocytopenia, uremia) and/or received aspirin or NSAIDs. At the end of the study, only 50% of cases had a DB<2 mg/dL, compared to 100% of controls.

Conclusions Compared to controls, cases had more advanced IFALD, which is associated with decreased Vitamin K and clotting factors. Consideration may be given to delaying an elective OP in neonates with advanced IFALD on FO. Also, medications known to interfere with platelet function and/or the COX pathway should not be used with FO.

55 CLINICAL FACTORS RELATED TO NEONATAL GROWTH IN CONGENITAL DIAPHRAGMATIC HERNIA

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Purpose of Study Children with congenital diaphragmatic hernia (CDH) are at risk for failure to thrive post neonatal discharge, which is associated with worse respiratory and neurodevelopmental outcomes. This study aims to characterize the growth of CDH infants during their initial hospitalization.

Methods Used We performed a retrospective study of 162 newborns with CDH at UCSF (2000–2013), excluding those who died prior to repair or had other congenital anomalies. Weight gain (g/day), head circumference (HC) and length growth (cm/week) were calculated. Bivariate and multivariate analyses were used to identify factors associated with growth parameters. A p-value less than 0.05 was considered significant.

Summary of Results Infants were 57% male with a mean gestational age (GA) of 37.7±2.7 weeks, a mean birth weight of 3.0±0.6 kg, and 85% had left-sided defects. Weight gain was sub-optimal for all infants, regardless of disease severity (Table 1). Growth improved with increasing length of stay (LOS), but stayed below normal (25g/d) newborn rates. At discharge, length growth was at expected (0.5cm/wk) newborn rates but HC growth did not meet expectations (0.5cm/wk). At discharge, infants requiring non-primary surgical repair or prolonged ventilation (>14 days) had significantly higher weight gain, but also had longer hospitalization (Table 1). After adjustment for GA, gender, duration of ventilation, and repair type in a multivariate model, LOS was the most predictive of weight gain at discharge (p<0.001).

Conclusions Growth failure in infants with CDH begins in the neonatal hospitalization, regardless of disease severity. Weight is more affected than HC or length. These findings reinforce the need to attend to neonatal nutritional management, particularly nutritional support at discharge.

Abstract 55 Table 1

	Full Group N=136*	Primary Repair N=57	Non-primary Repair N=79	p-value	Ventilation ≤14 days N=86	Ventilation >14 Days N=49	p-value
Age of Discharge (days)	42 (±29)	24 (±15)	54 (±29)	<0.001	27 (±14)	67 (±29)	<0.001
Weight Gain (grams/day)	10 (±13)	5 (±15)	15 (±10)	<0.001	8 (±15)	14 (±9)	0.01
Length Gain (cm/week)	0.5 (±0.7)	0.4 (±0.9)	0.5 (±0.4)	0.2	0.5 (±0.8)	0.5 (±0.4)	0.8
Head Circumference Gain (cm/week)	0.3 (±0.4)	0.3 (±0.4)	0.3 (±0.4)	0.6	0.3 (±0.3)	0.4 (±0.5)	0.1
Discharged on Full Enteral Feeds	134 (99%)	56 (98%)	78 (99%)	0.7	85 (99%)	48 (98%)	0.6
Discharged on Full Feeds by Mouth	86 (63%)	51 (89%)	35 (44%)	<0.001	68 (79%)	18 (37%)	<0.001
Discharged Home on Supplemental Oxygen	46 (34%)	8 (14%)	38 (48%)	<0.001	16 (19%)	30 (61%)	<0.001

*Infants who survived to discharge home.

56 EFFECTS OF PREMATURITY, BIRTH WEIGHT AND POSTNATAL AGE ON PRETERM INFANTS' HYPERCALCIURIA

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10.1136/jim-d-15-00013.56

Purpose of Study Hypercalciuria or urinary loss of calcium is common in preterm infants. It is the major metabolic disorder in nephrocalcinosis (NC) and is associated with a negative calcium balance. The objective of this study was to evaluate the effects of prematurity, birthweight and postnatal age on hypercalciuria in preterm infants.

Methods Used A prospective observational cohort study from April–September 2015 of 7 infants <32 weeks gestation or <1800g birthweight. Gestational age was determined from maternal last menstrual period or first prenatal ultrasound. All infants starting at 2 weeks of age had weekly spot urine calcium/creatinine ratios collected during their hospital stay until discharge. Data analyses were completed using standard statistical programs. Linear and nonlinear regression analyses were used to evaluate associations of prematurity, birthweight, and postnatal age with urine calcium/creatinine ratios.

Summary of Results The 7 infants' mean gestational age was 28.5±2.6 weeks (mean±SD) with a range of 26 to 32 weeks. The average birthweight was 1043±250g with a range of 790–1550g. Weekly urine calcium/creatinine ratios of the infants ranged from 0.18 to 1.9 mg/mg with a median of 0.68 mg/mg. Normal reported urinary calcium/creatinine ratio is less than 0.86 mg/mg (95th percentile, Sargent 1993). The highest urine calcium loss occurred at mean postnatal age 25.3±19.0 days. Correlations R of gestational age and hypercalciuria were –0.49, and birthweight –0.33 respectively.

Conclusions In preterm infants, hypercalciuria is inversely associated with gestational age and birthweight and occurs on average at 25 days of age. We speculate that prematurity and urinary calcium loss are important risk factors for calcium depletion in these high risk infants.

57 EVALUATING ALTERNATIVE APPROACHES TO THE MANAGEMENT OF INFANTS BORN TO MOTHERS WITH CHORIOAMNIONITIS

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10.1136/jim-d-15-00013.57

Purpose of Study Clinical chorioamnionitis is a risk for the development of early onset neonatal sepsis (EOS). New approaches to the management of the newborn are warranted to eliminate empiric antibiotic treatment in asymptomatic neonates as recommended in previous guidelines from the Centers for Disease Control and the American Academy of Pediatrics. The objective was to evaluate the use of the EOS calculator at our institution where routine antibiotics are not administered to infants with maternal chorioamnionitis.

Methods Used A retrospective data review was conducted from 2009 to 2014 for asymptomatic newborns ≥35 weeks born to mothers with clinical chorioamnionitis. Maternal and newborn demographics, risk factors, and neonatal outcomes were evaluated. The newborn sepsis calculator was used to determine EOS risk stratification.

Summary of Results This study included 209 infants with a mean gestational age of 39±1 weeks. The EOS calculator and clinical exam would have stratified 37% of these infants to clinical observation only, 36% to blood culture only, and 27% to receive empiric antibiotics. Laboratory testing would have been reduced by 38% and antibiotic exposure by 4%. However, 46% of infants whose scores indicated empiric antibiotics were not given antibiotic therapy based on our guidelines and remained well. Three culture positive EOS cases would have also been missed since they remained asymptomatic.

Conclusions Risk of EOS remains extremely low, even in infants born to mothers with chorioamnionitis. The EOS calculator did not appear to aid in the assessment and current management of our population. However, there remains a need to develop new universal approaches to safely reduce laboratory testing and unnecessary exposure of well appearing infants to antibiotic therapy.

Abstract 57 Table 1

EOS Risk Based on Maternal Factors	N (%)	Antibiotics Indicated by EOS Calculator+Exam	Exposed to Antibiotics with Current Hospital Guidelines	Treated for EOS with Current Hospital Guidelines	Culture Positive EOS
Low Risk <0.65/1000	83 (40)	5	23 (27)	16 (19)	3
Medium Risk 0.65–1.54/1000	76 (36)	1	24 (32)	19 (25)	5
High Risk >1.54/1000	50 (24)	50	23 (46)	19 (38)	3

58 LOW FREQUENCY RHYTHMIC WOMB-LIKE SOUNDS MODIFY AUTONOMIC ACTIVITY IN PREMATURE NEONATES

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10.1136/jim-d-15-00013.58

Purpose of Study The autonomic nervous system (ANS) influences cardiovascular homeostasis. Premature infants show immature ANS functioning evidenced by reduced cardiovascular stability. A fetus in-utero is exposed to low frequency rhythmic sounds from maternal heartbeats,

digestion, and breathing. Such stimulation integrates with ANS action through brain stem circuitry, and is lost with premature birth. If reintroduced, the sounds have the potential to alter neuroplasticity and autonomic functioning. We hypothesize low frequency rhythmic womb-like sounds postatally will increase protective heart rate variability, decrease salivary cortisol levels, decrease events related to apnea of prematurity (apnea >5 sec, HR <100 bpm, intermittent hypoxemia<90SpO2), and increase quiet sleep.

Methods Used A pilot study using a single subject design (subjects as their own controls). Vital signs for 20 patients will be collected over 24 hrs, in four 6-hour phases: baseline pre-sound, daytime sound, post-sound, nighttime sound. Cortisol levels will be taken pre and post sound exposure. Behavioral state will be assessed continuously with Q3H Neonatal Pain Agitation and Sedation Scales (NPASS) and Anderson Behavioral State Scales (ABSS).

Summary of Results Ten subjects have been studied to date. Preliminary data shows increased heart rate variability. Poincaré plots during auditory stimulation periods exhibit lower heart rates (RR intervals are longer), and dispersion of RR intervals increases as rates slow in a characteristic healthy pattern. A trend toward decreased rates of apnea and bradycardia also appeared. No difference in NPASS and ABSS scoring was shown during sound stimulation versus control periods.

Conclusions Low frequency rhythmic sounds designed to mimic the in-utero auditory profile affect ANS activity by promoting parasympathetic development, improving breathing, enhancing cardiac variability, and creating a calmer setting for growth and development in an intensive care unit. These outcomes may represent a non-invasive, cost effective intervention to promote ANS development in preterm neonates, leading to decreased morbidity and hospital stays.

59 REGIONALIZATION OF CARE AND OUTCOMES FOR NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA IN CALIFORNIA 2006–2010

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10.1136/jim-d-15-00013.59

Purpose of Study It is recognized that regionalization or stratification of neonatal intensive care units (NICUs) into levels of complexity has improved outcomes for newborns with congenital diaphragmatic hernia (CDH). However, little is known about the effect of regionalization of care on outcomes for these infants in California. The aim of this study is to determine if the types of hospitals that care for this population has changed over time and to determine healthcare based predictors of mortality.

Methods Used We studied data from the California Office of Statewide Health Planning and Development (OSHPD) for 2006–2010. CDH patients were identified using ICD–9-CM codes (756.6); mortality was determined based on OSHPD disposition codes. Using the California Children's Services (CCS) designation, NICUs were categorized as: (1) Community (2) Intermediate (3) Regional and (4) Non-CCS. Bivariate tests were used to compare frequency of care between hospital types. Multivariable (MV) analysis was completed to identify predictors of mortality.

Summary of Results 2,523,368 newborns were identified during 2006–2010. 205 patients with CDH in 2006–2010 were identified at their first admission. The mortality was 16%. Differences in patterns of care based on CCS classification are outlined in the table. Regional NICUs cared most patients (63% of survivors and 94% of non-survivors). On MV analysis, adjusting for race, sex, insurance, gestational age, birth weight, use of extracorporeal membrane oxygenation (ECMO), other co-morbidities and CCS designation, the AOR (95% CI) for mortality for CDH patients cared at a regional NICU compared a non-regional NICU was 5.1 (0.9–28.5). However, it does not reach statistically significant level. The AOR (95% CI) for mortality among CDH patients was 22.0 (5.5–87.2) for use of ECMO and 8.5 (1.8–40.2) if other comorbidities present.

Conclusions Only one hospital was designated as intermediate during 2006–2010. A large percentage of regional NICUs cared for >5 CDH patients. Our study suggest that regionalization of care should be considered when delivering health care to this high-risk population.

60 EFFECTS OF NEONATAL PHOTOTHERAPY ON PRODUCTION OF KERATIN 6A IN HUMAN FETAL SKIN

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Purpose of Study Neonatal phototherapy (PT) is the mainstay treatment for hyperbilirubinemia in newborns. Short-term side effects of PT are well documented. The long-term side effects are not well studied, with most investigations focusing on melanocytic nevi. We sought to see if a relationship exists between PT and precursor lesions associated with squamous cell carcinoma (SCC) by studying expression of intermediate filament proteins keratin (KRT) 6a and 13 in PT-exposed tissues.

Methods Used Epithelial tissue sections (n=14) were obtained from fetal samples between 11–18 weeks gestational age. Baseline samples were stored immediately in TRIzol reagent after collection. Control and experimental samples were incubated in tissue culture medium for 24 hours. The control samples were incubated in darkness, and experimental samples were incubated while exposed to PT. Quantitative PCR was performed using primers for KRT6a and 13, and were run in duplex using β-actin as an internal control.

Summary of Results KRT6a expression increased between baseline and control tissues (p=0.0007) and between baseline and experimental tissues (p=0.0302). There was no difference in KRT6a expression between control vs. experiment (p=0.0691). KRT13 expression decreased between baseline and experimental tissues (p=0.0065) with no difference between baseline and control tissues (p=0.2191).

KRT13 expression decreased from control to experimental tissues ($p<0.0001$). KRT6a expression increased with age in both the control and experimental groups ($p=0.0002$, $p=0.0017$ respectively) with no difference in baseline expression ($p=0.1460$).

Conclusions Our study suggests that 24 hours of PT does not result in significant fetal epithelial damage. Inflammatory response, as expressed by increase in expression of KRT6a, was not significantly different between control and experimental tissues. This showed that there is no relationship, through KRT6a, between PT and precursor lesions for SCC. Further research is required to identify other markers for epithelial damage and to determine the significance of decreased expression of KRT13 in response to PT. Immunohistochemical staining is planned to visualize differences in KRT6a protein expression among the baseline, control, and experimental groups.

Cardiovascular II
Concurrent Session
3:30 PM
Thursday, January 28, 2016

61 PEDIATRIC EKG TEACHING IN UCSF FRESNO PEDIATRIC RESIDENCY

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10.1136/jim-d-15-00013.61

Purpose of Study The purpose of the study is to create a standardized EKG curriculum in the UCSF Fresno Pediatric Residency Program. Its goal is to ensure that residents build competencies in EKG reading as they advance from PGY1 to PGY3.

Methods Used The residents were initially given a baseline EKG exam consisting of 20 multiple choice questions in order to evaluate their general knowledge of pediatric EKG reading. The residents were also asked to rate their perception of their level of skill in interpreting EKGs. The data gathered from the baseline exam based on the most commonly missed questions were analyzed. An online EKG module was then created providing a systemic approach to EKG reading as well as supplemental information on the most commonly missed concepts. The time spent by the pediatric resident on the EKG module was tracked via a software program. A subsequent 20 multiple choice question test was administered during resident half day lectures.

Summary of Results The study showed no significant improvement in the scores as the residents advance from PGY1 to PGY3. After implementation of the online EKG module, residents had a higher mean score and ranked a higher perceived ability to read EKGs. Paired t-test showed a mean score of 10.6 out of 20 in the baseline exam compared to mean score of 11.6 after the EKG module was given ($P<0.0001$). The mean perception of ability to read EKG ranked from 1 to 5. The mean ability to read EKG ranking was 1.95 in the baseline exam compared to 2.50 after the EKG module ($P=0.0008$).

Conclusions Standardized EKG curriculum delivered through an online module in a residency program allows pediatric residents to have building blocks to increase their knowledge in reading EKGs as they advance in their training from PGY1 to PGY3. As a result, the curriculum also builds their confidence and results in increased ranking of perceived ability to read EKGs.

62 VENTRICULAR FIBRILLATION WAVEFORM MEASURES DO NOT DISTINGUISH BETWEEN ISCHEMIC AND NON-ISCHEMIC ETIOLOGY OF CARDIAC ARREST

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10.1136/jim-d-15-00013.62

Purpose of Study One-third of out-of-hospital cardiac arrests (OHCA) present with ventricular fibrillation (VF). Cardiac arrest can be precipitated by ischemic or non-ischemic causes. Treatment during resuscitation can depend in part on ischemia status, so determining etiology of arrest is important.

The VF signal can be evaluated in real-time using quantitative waveform measures (QWM). Animal studies suggest that QWM can distinguish between ischemic and non-ischemic causes of VF OHCA. We sought to evaluate this relationship in humans using a large, well-characterized database of OHCA.

Methods Used We used a convenience sample of resuscitated patients with VF OHCA from King County EMS. Patients were classified as ST elevation myocardial infarction (STEMI) ($n=158$), non-ST elevation myocardial infarction (NSTEMI) ($n=133$), or non-ischemic arrest ($n=167$). ECG recordings were analyzed in MATLAB. We compared 4 QWM: Amplitude Spectrum Area (AMSA), Centroid Frequency (CF), Mean Frequency (MF), and Median Slope (MS). Comparisons were made for Shock 1 and the change in QWM between Shocks 1 and 2. We used ANOVA to compare across the 3 etiologies. A $p<0.01$ was considered statistically significant given multiple comparisons.

Abstract 62 Table 1 First Shock QWM [95% CI]

	Ischemic: STEMI	Ischemic:NSTEMI	Non-Ischemic	ANOVAp value
AMSA	2.21 [2.13, 2.29]	2.24 [2.15, 2.33]	2.29 [2.21, 2.37]	0.38
CF	1.90 [1.88, 1.93]	1.91 [1.88, 1.94]	1.94 [1.91, 1.96]	0.22
MF	1.84 [1.82, 1.86]	1.85 [1.83, 1.87]	1.86 [1.84, 1.88]	0.57
MS	–9.70 [–9.79, –9.62]	–9.67 [–9.76, –9.59]	–9.64 [–9.72, –9.56]	0.53

Abstract 62 Table 2 Percent Diff for Shock 1 and 2 [95% CI]

	Ischemic: STEMI	Ischemic:NSTEMI	Non-Ischemic	ANOVAp-value
AMSA	7.49 [2.93, 12.04]	3.68 [–0.56, 7.91]	5.21 [0.98, 9.44]	0.49
CF	–3.03 [–4.54, –1.52]	–5.33 [–7.52, –3.15]	–3.97 [–5.62, –2.32]	0.21
MF	–1.46 [–3.02, 0.09]	–4.23 [– 5.83, –2.63]	–3.73 [–5.14, –2.32]	0.03
MS	0.76 [0.02, 1.50]	0.41 [–0.39, 1.20]	0.66 [–0.05, 1.36]	0.80

Summary of Results We did not detect a statistical difference across the 3 groups at Shock 1 or in the relative change from Shock 1 to Shock 2.
Conclusions In human VF OHCA, QWM (AMSA, CF, MF, and MS) did not distinguish etiology according to clinical ischemia status. Although promising in experimental settings, QWMs do not appear well suited to identify the etiology of arrest during resuscitation. The study highlights the importance of human data to determine whether experimental results translate to a clinical setting.

63 EFFECTS OF TUMOR NECROSIS FACTOR-α IN AN *IN VITRO* MODEL OF AORTIC VALVE STENOSIS

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Purpose of Study Calcific aortic valve disease is associated with hyperlipidemia, the effects of which appear to occur through chronic inflammation. The clinical severity appears to result from nodular calcification and leaflet stiffening, which restrict valve opening. A better understanding of the mechanisms underlying calcification and stiffening is critical for the development of early diagnosis and medical therapy. We hypothesize that leaflet stiffening is due to a phenomenon resembling wound contracture.
Methods Used We employed an *in vitro* model of aortic valve stenosis to assess the effects of inflammation on valvular cell compaction, stiffness, nodule formation, and collagen orientation. Murine valvular interstitial cells were seeded in 3-D collagen gels and treated with or without tumor necrosis factor-alpha (TNF-α) in osteogenic media.
Summary of Results TNF-α treatment promoted nodule formation and increased the hydrogel stiffness with a compressive modulus of 1316 Pa compared with control (877 Pa). Interestingly, TNF-α did not further increase compaction. Co-treatment with Y27632, a rho-kinase inhibitor, or blebbistatin, a myosin II inhibitor, inhibited nodule formation, compaction, and stiffness induced by TNF-α, suggesting that cell contraction causes the stiffness of the hydrogels. Second-harmonic generation microscopy showed that compaction and stiffness correlated with increased interactions between cells and with cell-induced changes in collagen fibrils. These effects were also disrupted by Y27632 and blebbistatin.
Conclusions Valve cells induce compaction and stiffening in 3-D collagen hydrogels, similar to wound contracture. Compaction and stiffness are related to collagen fibril alignment between cells. TNF-α promotes nodule formation and hydrogel stiffness through a mechanism mediated by rho-kinase and myosin II.

64 THE IMPACT OF CARDIAC TRANSPLANT REJECTION BY TIME POST-TRANSPLANTATION

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10.1136/jim-d-15-00013.64

Purpose of Study Heart transplant rejection can occur anytime post transplantation. Rejection can be in any form, acute cellular rejection (ACR) or antibody mediated rejection (AMR). Both are described as any-treated rejection. It has not been firmly established as to the subsequent 1-year outcome of rejection episodes over time.
Methods Used Between 2003 and 2013, we evaluated 849 heart transplant patients where 134 patients had any-treated rejection episode over time from transplant. Patients were divided into 3 groups: Group A=rejection <1-year, Group B=rejection within 1–5 years, Group C=rejection >5 years. For all groups, endpoints included subsequent 1-year survival, freedom from cardiac allograft vasculopathy (CAV) ≥ 30% by angiography, and Non-Fatal Major Adverse cardiac events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, implantable cardioverter defibrillator/pacemaker implant, stroke).
Summary of Results Later, rejection episodes trended to have worsening 1-year survival compared to Group A. There was significantly less subsequent 1-year freedom from CAV and a trend for worsening freedom from

Abstract 64 Table 1

Endpoints	Group A Rejection <1 Year (n=95)	Group B Rejection1–5 Years (n=27)	Group C Rejection>5 Years (n=12)	P-Value
Subsequent 1-Year Actual Survival	91.20%	76.1%*	81.80%	0.076
Subsequent 1-Year Actual Freedom from CAV	94.30%	82.3%*	73.3%*	0.013
Subsequent 1-Year Actual Freedom from NF-MACE	79.80%	62.1%*	65.60%	0.064

*p<0.05 compared to Group A (Rejection <1 Year).

NF-MACE in those patients in Group B and C compared to Group A.

Conclusions Cardiac rejection later after heart transplantation is associated with worse outcome compared to those patients with rejection <1-year. These later episodes of rejection may be more damaging in that outcome is compromised. Careful vigilance for these later rejection episodes is warranted.

65 IDENTIFYING DISABLED PATIENTS AFTER HEART TRANSPLANTATION: WHAT MAKES SENSE?

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10.1136/jim-d-15-00013.65

Purpose of Study Patients who undergo heart transplantation are considered disabled for up to one year as described by Medicare. Afterwards, patients are evaluated on a case-by-case basis to determine if they are indeed disabled. One of the acceptable means to judge disability is via the cardiopulmonary stress test (CPX). This test cannot be manipulated as patients need to reach anaerobic threshold. We have used the CPX to assess for disability after heart transplantation, we now present our results.

Methods Used Between 2003 and 2013, we assessed 19 heart transplant patients who requested disability based on various symptoms which included fatigue, shortness of breath, dizziness, and chest pain. These patients underwent cardio-pulmonary stress testing to assess their true cardiac reserve.

Summary of Results The mean VO2 max was 14.5 cc/kg/min with 57.9% being less than 15 cc/kg/min, which places these patients in functional class III-IV. All 19 patients had VO2 max less than 20 cc/kg/min (functional class II-IV). The VE/CO2 was 33.7, the percent workload was 43.0, and the work capacity was 50.5. See Table 1.

Conclusions Most heart transplant patients who have symptoms of fatigue and reduced stamina have limited cardiac reserve via CPX testing. This may be due to the denervated heart but nonetheless should qualify these patients for a disabled state.

Abstract 65 Table 1

Endpoints	Number of Patients (N=19)
VO2 Max Mean ±SD	14.5±3.90
VO2 Max Percent Predicted Mean ±SD	50.6±17.71
Anaerobic Threshold Percent Predicted Mean±SD	42.4±11.20
VE Max Predicted Mean±SD	48.6±15.50
VE/VCO2 Measured Mean±SD	33.7±4.80
Work Capacity (Watts) Mean±SD	50.5±24.70
Work Percent Predicted Mean±SD	43.0±21.54
Exercise Duration (min) Mean±SD	7.5±3.04
NYHA functional class II-IV (%)	36.8% (7/19)
NYHA functional class III-IV (%)	63.2% (12/19)

66 MATERNAL HIGH FAT DIET AND DEVELOPMENTAL ORIGINS OF MYOCARDIAL DYSFUNCTION

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10.1136/jim-d-15-00013.66

Purpose of Study Maternal high fat diet (HFD) is an *in utero* insult that increases the risk of adult onset cardiovascular disease in offspring. Subtle changes that occur in the developing heart, prior to the onset of adult disease, are unknown. Echocardiographic strain analysis assesses deformation of the myocardium, and can detect subclinical variations in myocardial mechanics prior to the onset of disease. The purpose of this study was to use strain analysis to detect subclinical changes in myocardial mechanics prior to onset of overt cardiac dysfunction.

Methods Used Adult female rats received HFD or regular diet (RD) for 5 weeks prior to mating, through gestation and weaning. After weaning at day 21, all offspring were given RD. Echocardiograms were performed at postnatal days 21 or 60, followed by harvesting of the heart. Shortening fraction and heart rate were measured from M-mode images. Global average parameters of left ventricle (LV) strain, strain rate, and velocity data were measured from short axis and apical views.

Summary of Results Compared to RD, maternal HFD was associated with an increased heart weight to body weight ratio at day 21 in males (6.0±0.7 vs 8.0±1.1 mg/g, $p<0.01$) and at days 21 (6.2±0.6 vs 8.1±1.2 mg/g, $p<0.01$) and 60 (3.7±0.4 vs 4.0±0.2 mg/g, $p=0.02$) in females. There was no significant difference in LV shortening fraction in either sex at day 21 or 60. Maternal HFD was associated with lower heart rate in both males and females at days 21 and 60. A relative augmentation in myocardial deformation was seen in HFD males in circumferential strain (–23.6±4.3 vs –27.1±2.9%, $p=0.03$) and longitudinal velocity (0.9±0.1 vs 1.2±0.3cm/sec, $p=0.02$) at day 21.

Conclusions Maternal HFD is associated with increased cardiac mass and decreased heart rate in young male and female offspring in the absence of overt dysfunction. Male offspring demonstrated augmented myocardial deformation at day 21 but not at day 60. Further study is needed to determine if the subclinical difference in myocardial mechanics is secondary to compensatory remodeling that predisposes to later dysfunction.

67 CHARACTERIZATION OF HEART TRANSPLANT PATIENTS WITH RAPIDLY PROGRESSIVE CARDIAC ALLOGRAFT VASCULOPATHY

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10.1136/jim-d-15-00013.67

Purpose of Study Cardiac allograft vasculopathy (CAV) is a heterogeneous disease which can be quite indolent and quite rapid in progression. It is not known what is the mechanism for this rapidly progress disease. Therefore, we sought to evaluate these patients whose underlying CAV

Abstract 67 Table 1

Endpoints	Non-Rapid CAV (n=84)	Rapid CAV (n=8)	P-Value
Subsequent 1-Year Actual Survival	94.9%	75.0%*	0.025
Subsequent 1-Year Actual Freedom from NF-MACE	88.0%	87.5%	0.970
Subsequent 1-Year Actual Freedom from de novo DSA	100.0%	100.0%	1.000

*p<0.05 compared Non-Rapid CAV.

progressed within 6 months after the sentinel coronary angiogram.

Methods Used Between 2009 and 2013 we assessed 517 heart transplant patients of which 92 had established CAV. 8/92 patients had rapidly progressive CAV. These patients were assessed for risk factors including sensitization, diabetes, age of the donor, history of CMV, first year rejection episodes. Endpoints included 1-year survival and freedom from Non-Fatal Major Adverse Cardiac Events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, implantable cardioverter defibrillator/pacemaker implant, stroke).

Summary of Results Patients with rapidly progressive CAV had a similar percentage of circulating antibodies compared to those 92 patients with non-rapidly progressive CAV. 1-year survival was significantly less in the rapidly progressive CAV group but NF-MACE was similar between groups. There were no significant differences in demographics.

Conclusions Heart transplant patients who develop rapidly progressive CAV have worse survival and do not appear to have more circulating antibodies. Further investigation into the mechanisms of rapidly progressive CAV be important in reducing its development.

68 SEIZURES POST HEART TRANSPLANTATION: WHAT ARE THE RISK FACTORS?

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10.1136/jim-d-15-00013.68

Purpose of Study Seizure activity after heart transplantation is not uncommon. This may be due to use of calcineurin inhibitors (CNI's) which are known to reduce the threshold for seizure activity. Patients who have had previous stroke prior to transplant may be at risk but this is not known. The risk factors for the development of seizures after transplant have not been firmly established.

Methods Used Between 2010 and 2013 we assessed 343 heart transplant patients and found 10 patients (2.9%) who developed seizures within the first month after heart transplantation. All patients received tacrolimus-based immunosuppression and some received anti-thymocyte globulin (ATG) induction. Risk factors for stroke included: previous seizure disorder, history of stroke, history of MCS device, % female, underlying diagnosis of coronary artery disease (CAD), and ATG induction. Risk factors and characterizations of these patients were then pursued.

Abstract 68 Table 1

	Seizure within 1-month Post-OHT (n=10)
History of Pre-OHT Stroke (%)	20.0% (2/10)
History of Pre-OHT Seizure (%)	0.0% (0/10)
History of MCS Device (%)	20.0% (2/10)
Female %	10.0% (1/10)
Underlying Diagnosis for CAD (%)	20.0% (2/10)
ATG Induction (%)	40.0% (4/10)

Summary of Results The 10 heart transplant patients that developed seizures had increased risk of pre-transplant stroke which most likely was a nidus for seizure activity. There was no difference in the seizure group for history of pre-transplant seizures, history of MCS device, % female, underlying diagnosis for CAD, or being given ATG compared to historical controls. Seizures were treated with the use of Keppra, Versed, Dilantin.

Conclusions Seizures after heart transplantation are not uncommon and are seen in 2.9% of heart transplant patients. History of previous stroke prior to transplant appears to be a risk factor for seizures post-transplant.

Community Health I
Concurrent Session
3:30 PM
Thursday, January 28, 2016

69 EFFECTS OF BODY MASS INDEX, SELF PERCEPTION AND CULTURE ON SELF ESTEEM IN CHILDREN

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10.1136/jim-d-15-00013.69

Purpose of Study In the US obesity has more than doubled in children in the past 30 years. This study attempts to explore factors involved in the perception of self-esteem as a measure of weight loss motivation in children.

Methods Used 213 children, ages 9–15 yr, at risk for unhealthy weight (≥BMI 85th percentile) came from San Bernardino County schools or clinics to join Operation Fit, a week long day camp for lifestyle education. Child body mass indices were measured and surveys were given testing their knowledge on nutrition and healthy living, their perception of their own health, body self-esteem and demographics (language was used to measure culture). A statistical regression analysis was run to assess the effects of BMI, self-perception and culture on self-esteem by comparing data gathered to 4 questions from the self-esteem survey: "Kids my own age like my looks (KMOA)," "I like what I look like in pictures (ILWIL)," "I'm pretty happy about the way I look (IPHL)," and "I really like what I weigh (ILWIW)".

Abstract 69 Table 1 Kids my own age like my looks

Variable	P-value	OR	95% CI
Age	0.44	0.93	(0.77–1.12)
Gender:	Ref	1.00	Ref
Male	0.04*	2.00	(1.00–4.00)
Female			
Race:	Ref	1.00	Ref
Non-Hispanic	0.94	0.96	(0.37–2.46)
Hispanic			
Language:	Ref	1.00	Ref
English	0.04*	2.16	(1.02–4.58)
Spanish			
BMI:	Ref	1.00	Ref
Normal Weight	0.52	0.75	(0.32–1.76)
Overweight/Obese			
Healthy Perception:	Ref	1.00	Ref
Unhealthy	0.35	0.71	(0.34–1.45)
Healthy			

*Significant at p<0.05.

Summary of Results For question KMOA there was a statistical significance for language and gender. For females, the odds that their peers did not like of their looks was increased by a factor of 2. The same could be said for Spanish speakers exclusively. For questions ILWIL, IPHL and ILWIW no significance was found for any of the variables.

Conclusions Self-esteem was affected negatively for Spanish speaking children and females with regards to the question "kids my own age like my looks." This may indicate that a cultural and gender difference exists when it comes to how Spanish speakers or female children view how others think about them. This data could guide development of motivational tools for changes in healthy lifestyle in Spanish speakers and female children.

70 IMPLEMENTING TEAM-BASED HEALTH PROMOTION PROGRAMS FOR YOUTH IN OREGON CORRECTIONAL FACILITIES

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10.1136/jim-d-15-00013.70

Purpose of Study Delinquent youth in closed-custody correctional facilities in Oregon are provided evidence-based programs to prevent future criminal behavior but lack education on healthy lifestyle choices. ATLAS (male) and ATHENA (females) are evidence-based, peer-led, coach facilitated scripted health promotion programs for high school athletes. The purpose of this study was to assess outcomes of implementing ATLAS and ATHENA in youth correctional facilities.

Methods Used Designated youth in Oregon correctional facilities were formed into six teams (two female, two younger male, two older male) with counselors acting as "coaches". ATLAS and ATHENA were implemented one-hour per week for 8 to 10 weeks. Healthy lifestyle knowledge, attitude and behavior were evaluated before and after the program. Global ratings and qualitative feedback were received after the program.

Summary of Results Six youth per team began the program (female age 17.2, 16–18; male age 18.1, 16–21; male age 21.8, 20–24). The programs were feasible and acceptable with limited counselor training. Attrition was high due to transfers, disciplinary actions, and loss of interest, with 7 of 12 completing ATHENA, and 17 of 24 completing ATLAS.

Significant gains in knowing the basics of good nutrition and how to strength train were found universally. Following ATHENA, participants had significantly lower intent to use body shaping drugs to control weight, with favorable trends in reduced social pressure to control weight. Following ATLAS, there was significantly less intent to use anabolic steroids/supplements and less belief in magazine ads. Global ratings were uniformly strongly positive for ATHENA and for ATLAS among younger participants. Older ATLAS participants were neutral about the program, and did not feel their teammates were interested and helped each other learn.

Conclusions Evidence-based peer-led, scripted programs produced favorable changes in adolescents' knowledge, attitudes and behaviors. Programs were modified to better align with the setting with plans to assess the revised curriculum in late 2015. Why outcomes in older males differed requires further study.

71 A SURVEY ON COLLEGE STUDENTS SEEKING HEALTHCARE FROM A UNIVERSITY STUDENT HEALTH CENTER: USE AND INTERESTS IN COMPLEMENTARY AND ALTERNATIVE MEDICINE

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10.1136/jim-d-15-00013.71

Purpose of Study The increase in complementary and alternative medicine (CAM) use within the past decade raises concerns for proper use and education on its safety and efficacy. CAM use is high among college students; however, CAM preferences among college students actively seeking healthcare has not been studied. Our goal is to evaluate CAM use among this unique population.

Methods Used A cross-sectional print survey was distributed to college student patients at the University of California Irvine's Student Health Center (SHC) to assess previous CAM use and preferences for future CAM use and education, from January to February 2013. The 403 respondents included undergraduate and graduate students seeking medical healthcare from the SHC. The respondents generally represented the academic and racial composition of students at the university. Means and proportions were used to describe study demographic characteristics.

Summary of Results 67.0% of respondents had used CAM for medical purposes within the last year. 27.0% overall would use CAM for their current health condition, and 51.9% would consider CAM for their current health condition if they were more knowledgeable. Patients with chronic pain and stomach problems were most willing to

use CAM for their current conditions (70.0% and 50.0%, respectively). Many respondents stated that they were willing to use CAM for stress (65.3%) and maintenance of health (54.1%). Respondents were most willing to learn about dietary/nutrition (46.7%), massage (45.4%), and vitamin/mineral supplements (38.0%). Most indicated that they would read a brochure about CAM if available at the SHC (77.2%), would read about CAM if available on the SHC website (68.7%), and would like their physicians at the SHC to advise them about CAM (71.2%).

Conclusions The results support that CAM use is prevalent among college student patients. Most students requested more knowledge to assist in their decisions regarding CAM use. They were interested in learning about CAM through potential educational resources that can be easily implemented. Thus, student health centers can serve as convenient sources for CAM education considering that large proportions of college students use these sites for medical healthcare.

72 ADDRESSING BEHAVIORAL HEALTH IN SENIOR CITIZENS THROUGH A PILOT LAUGHTER THERAPY CLUB IN PALMER, ALASKA

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10.1136/jim-d-15-00013.72

Purpose of Study To improve behavioral health in senior citizens through participation in a laughter therapy group. The Matanuska-Susitna Borough is home to almost 90,000 people, 9% of whom are age 65 and older. With only two mental health providers accepting Medicare in the region, and most primary care practices having reached their Medicare capacity, mental health services are limited for local seniors. A community need exists for developing affordable and accessible ways to address mental health issues like depression and anxiety in the senior population.

Methods Used Through community conversations and clinical observations, it became clear that many seniors are burdened with mental health ailments. After conducting a literature review focused on behavioral health interventions for seniors, the findings were presented to the deputy director of Mat-Su Senior Services. Their desire to find low cost interventions that would not carry the stigma of being therapeutic in nature informed the development of a pilot laughter therapy session, a low cost and low resource behavioral health intervention that has been shown to improve symptoms of depression, short-term memory function, and quality of sleep in seniors.

Summary of Results Following discussions with Mat-Su Senior Services, focus was narrowed to a single intervention that could be incorporated into the regular daytime programming of the Palmer Senior Citizens Center. An outline of the laughter therapy session, called laughter club, was submitted to the deputy director and then circulated between other administrators. The outline was approved and a tentative date was scheduled to pilot the session. A sign-up sheet was created and a lunch announcement was made at the senior center about the pilot program, which included a demonstration that was received with many laughs.

Conclusions In a community where mental health resources are limited, laughter therapy is a viable way to support seniors who may be struggling with behavioral health problems. The challenge of recruiting individuals to participate in the laughter club remains. The next step for the community is to hold its first laughter club meeting, and based on the results, determine whether or not to continue with weekly or monthly sessions.

73 IMPROVING CONCUSSION EDUCATION, DIAGNOSIS, AND MANAGEMENT IN COULEE DAM, WA THROUGH THE DEVELOPMENT OF A PARTNERED CONCUSSION PROTOCOL

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10.1136/jim-d-15-00013.73

Purpose of Study This project aims to increase the efficacy of concussion education, diagnosis, and management in high school sports in Coulee Dam, WA.

Methods Used To address this need, several meetings and an information session were held to gather input from parents, the school nurse, athletic director, school principal, and head football coach, as well as input from various medical professionals from CMC and other physicians - including a sports medicine fellow - in nearby Spokane, WA. A review of the concussion protocol literature was also conducted.

Summary of Results A concussion protocol was developed for all sports at LRHS that included education of coaches, athletes, and parents to the signs and symptoms of concussion; preseason and post-concussion neurocognitive testing for athletes; the use of sideline concussion testing during practices and competitions; communication between LRHS, CMC, and parents; procedures for returning concussed athletes to the classroom; and a graduated return-to-play protocol. The concussion protocol was approved by both LRHS and CMC at the end of the 2014–2015 school year to begin implementation at the beginning of the 2015–2016 school year.

Conclusions This project was successful in that a protocol was developed with both input and support from LRHS and CMC, as well as medical professionals from the surrounding area. One of the main challenges with its implementation will be gathering the support of parents for the preseason cognitive testing. Another hurdle may be improving athletes' perceptions of self-reporting and reporting their teammates for concussion symptoms. After the protocol's implementation this coming school year, we hope to implement similar protocols in the nearby rural communities of Wilbur, WA and Coulee City, WA.

74 EFFECTS OF FOOD AS POSITIVE REINFORCEMENT AND CHILD'S BODY MASS INDEX

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10.1136/jim-d-15-00013.74

Purpose of Study San Bernardino County (SBC), California has among the highest rates of childhood obesity in the country, leading to adult obesity, hypertension, and

Abstract 74 Table 1

Variable	P-Value	OR	95% CI
Age	0.97	1.00	(0.79–1.262)
Gender	Ref	1.00	Ref
Male	0.84	0.92	(0.41–2.05)
Female			
Race	0.01*	0.134	(0.02–0.64)
Hispanic	Ref	1.00	Ref
Non-Hispanic			
Sweets	0.34	0.60	(0.21–1.71)
Agree	Ref	1.00	Ref
Disagree			
Favorite Food	0.02*	3.40	(1.20–9.64)
Agree	Ref	1.00	Ref
Disagree			

*Significant at p<0.05.

Abstract 75 Table 1

Variable	P-value	OR	95% CI
Age	0.69	1.04	(0.83–1.31)
Gender	Ref	1.00	Ref
Male	0.81	0.91	(0.42–1.98)
Female			
Race	Ref	1.00	Ref
Non-Hispanic	0.01*	0.14	(0.03–0.67)
Hispanic			
Language	Ref	1.00	Ref
English	0.61	1.23	(0.55–2.72)
Spanish			
Children eat enough	Ref	Ref	Ref
Disagree	0.27	1.82	(0.62–5.39)
Neutral	0.02*	2.80	(1.13–6.89)
Agree			

*Significant at p<0.05.

diabetes. Factors may include families using food and sweets as ways of positive reinforcement. This study investigates the effects of parents offering food as positive reinforcement to their child's BMI.

Methods Used Operation Fit (OF) provided 198 children (9–15 y/o) with healthy lifestyle education during a week-long day camp. School nurses/MD's referred unhealthy weight children to OF. "I offer sweets to my child as a reward for good behavior" and "I offer my child his/her favorite foods as a reward for good behavior" were two statements parents rated. These were recorded with their child's gender, age, and race and were compared with camper BMI, which were divided into healthy weight (<85%) and unhealthy weight (≥85%).

Summary of Results Logistic analysis showed that the odds of being an unhealthy weight increased by 0.134 units for Hispanics than for Non-Hispanics. For parents who reward children with their favorite food, the odds of being overweight increased by a factor of 3.40. There was no significance in gender, language, or parents who reward their children with sweets in relation to a child being a healthy or unhealthy weight.

Conclusions These results show that rewarding children with their favorite foods as positive reinforcement may be harmful to their health with BMI elevation. The increased odds may continue into their adult years with subsequent hypertension and diabetes secondary to obesity. Effort needs to be placed on educating parents on the importance of applying healthier methods of positive reinforcement.

75 PARENTAL GUIDANCE OF MEAL PORTIONS AND CHILDHOOD OBESITY

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10.1136/jim-d-15-00013.75

Purpose of Study In 2013, 1/3 of students in San Bernardino County had unhealthy weights. Lifetime disease risks are increased in overweight individuals. Finding factors contributing to obesity rates is a crucial component of creating better health education initiatives that can directly address relevant issues. This study's goal was to determine if parental idea of appropriate meal portions for children was a contributing factor to childhood obesity.

Methods Used Children aged 9–15 participated in a 5-day day camp "Operation Fit". Campers were referred based on their risk for unhealthy weight. The BMIs of 198 campers were taken. Parents were surveyed for responses to the statement, "I have to be especially careful to make sure my child eats enough".

Summary of Results Logistical analysis was run to find if there was any connection between a child being of unhealthy weight (BMI > 85%) and a parent's response to the question. The table below shows results, indicating that the odds of a child being overweight increased by a factor of 2.8 if the parents reported the need to make sure that their child ate enough as opposed to parents who stated no need to enforce a minimal amount of eating.

Conclusions These results show that parental role in guiding meal sizes for children could play a factor in determining a child's weight. The increased odds of a child being overweight with parents who reported needing to enforce their idea of enough food indicates that teaching parents child- appropriate meal sizes could be beneficial for reducing childhood obesity.

76 EXAMINING BARRIERS TO EARLY IDENTIFICATION OF ASD IN IMMIGRANT PEDIATRIC PRIMARY CARE PATIENTS

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10.1136/jim-d-15-00013.76

Purpose of Study Immigrant-non-immigrant disparities in autism spectrum disorder (ASD) and developmental disability (DD) diagnosis may be modified by primary care pediatrician (PCP) practices and beliefs. The objectives of this study were to: better understand the challenges that parents of immigrant children with ASD/DD experience in receiving a diagnosis and treatment; to assess ASD and

developmental screening practices, attitudes toward ASD identification in immigrant children in Colorado; and to identify barriers to ASD identification for immigrant children, in a sample of Colorado primary care providers.

Methods Used A mixed methods approach was taken to provide in-depth discussion and context of parents' experience, while also providing the opportunity the describe parents' access to services. Focus groups were convened with consenting immigrant participants to better understand parent/patient barriers to care. Participants also completed a survey to gather demographic information and assess parent's knowledge of and access to autism/developmental disability support services. We assessed rates of general developmental and ASD screening, perceptions of parent ASD knowledge in Immigrant and non-immigrant families, and perceptions of barriers to early ASD identification for immigrants.

Summary of Results Parents reported limited knowledge about ASD and related services. Qualitative data indicate parents encountered community physicians who did not take concerns about their child's development seriously. Parents also reported: cultural barriers, a confusing service system that was difficult to navigate. 76% of PCPs offered some form of developmental screening, and most PCPs thought that immigrant parents were less knowledgeable about ASDs than non-immigrant parents.

Conclusions Multiple factors in the primary care setting may contribute to delayed ASD identification for immigrant children. Promoting language-appropriate screening, disseminating culturally appropriate ASD materials to immigrant families, improving the specialist workforce, and providing PCP support in screening and referral of immigrant children may be important ways to reduce racial and ethnic differences in care. Developing a health navigation model with trained parents/community health workers may be a novel way to provide parents support in navigating the system.

77 A MULTIFACETED SUICIDE PREVENTION CAMPAIGN FOR RURAL MONTANA

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10.1136/jim-d-15-00013.77

Purpose of Study In 2013, Montana had the highest suicide rate in the US, with 23.9 deaths per 100,000 people, compared to 13 per 100,000 nationally. Beaverhead is the largest county in Montana, consisting of small ranching communities. It has a population of 9,300 and consistently ranks in the top 10 for highest suicide rates in the state. This campaign aimed to increase knowledge and awareness of suicide prevention in Dillon, Montana using targeted interventions for several different audiences.

Methods Used A recent suicide in Dillon was upsetting to first responders and shocked the community. After exploring the local mental health crisis resources, there seemed to be a need for community awareness on suicide prevention. The Beaverhead County Mental Health Local Action Committee (BCMHLAC) agreed, and many project partners were found in this subgroup. A literature review revealed that the most effective evidence-based suicide interventions are 1) restricting access to lethal means and 2) increased screening and treatment for depression. In Montana, over 63% of completed suicides are with a firearm, and 91% use a handgun. Because depression is the primary disease associated with completed suicides, and because up to 45% of suicide patients visit their primary care provider within a month of their death, outreach included local providers.

Summary of Results To address lethal means restriction, a pilot trigger lock program was implemented in partnership with the Montana Suicide Prevention Officer. The public was informed about the free locks through an article published in the Dillon Tribune. Additionally, locks were available to ER staff as a resource for families of suicidal patients seen in the ED. A separate campaign promoting the national suicide hotline was launched in Dillon bars, using posters featuring local photography. Lastly, an information packet was given to all primary care providers and their staff. The packet highlighted suicide statistics for Montana, and was an appeal to increase depression screening in the clinics. Screening forms and a patient information poster for exam rooms were also included.

Conclusions Many great partnerships were formed, and if the trigger lock pilot program is successful, it can be expanded. Continued work with the BCMHLAC will strive to increase access to mental health and suicide crisis resources in Dillon, Montana.

78 LESSONS LEARNED FROM ADOLESCENT PEER EDUCATORS WORKING TO EFFECT CHANGE IN ADOLESCENT HEALTH BEHAVIORS

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10.1136/jim-d-15-00013.78

Purpose of Study Although adolescents are at risk for engaging in behaviors with lifelong negative health consequences, adolescents are also relatively healthy individuals who often do not seek preventive health care. The use of a peer-peer education program has been shown to be a successful model for improving health behaviors in adolescents, thus such a program was initiated at a large urban high school in Fresno, CA. Members (grades 9–12) of the Fresno High School Women's Alliance, an elective program designed to develop personal behavior and academic skills to enable students to achieve success in the classroom and beyond have partnered with the UCSF-Fresno Pediatric Residency Program to develop a peer education program at Fresno High School.

Methods Used Pediatric residents meet weekly with these students to develop presentations of interest to high school students, working with the high school students to design and implement community health research projects.

Summary of Results Topics presented thus far have included Teen Pregnancy, Sugar in Drinks (Obesity Prevention), Improving Body Self-Image, Exercise can be Fun, and Bullying.

Conclusions In the development of these lunchtime presentations, the peer educators have learned how to better engage their counterparts to try to improve their overall health. These lessons have included the following: 1) work together as a group to deliver a common, simple message, 2) topic needs to be of personal interest and relevant to the students, 3) it helps to be innovative to get their fellow students attention (e.g. the "Game of Life" chalked on the blacktop to address Teenage Pregnancy), 4) provide education that lets fellow students make their own informed decisions rather than simply telling them what to do, 5) keep surveys short, with true/false, yes/no, multiple choice responses, with the surveys de-identified, 6) do presentations at lunchtime to have a wider audience, 7) offer incentives for audience participation (such as Jamba Juice cards), and 8) get the school leadership involved (e.g. principal danced with students in "Exercise can be fun").

Global Health
Concurrent Session
3:30 PM
Thursday, January 28, 2016

79 NEEDS ASSESSMENT OF PRE-HOSPITAL CARE IN NICARAGUA: ADMINISTRATORS' PERSPECTIVES

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10.1136/jim-d-15-00013.79

Purpose of Study Describe barriers to high quality pre-hospital care in Nicaragua from a pre-hospital administrator's perspective. Identify areas for potential collaboration of Project Semilla, UNAN and Nicaraguan pre-hospital agencies (Red Cross, government firefighters and volunteer firefighters) to improve conditions.

Methods Used Prospective, anonymous, voluntary survey questionnaire using Teamscope smartphone app. Convenience sample of pre-hospital care administrators from Red Cross, government firefighters and volunteer firefighter agencies. Classification, minimum education requirement, number of ambulances, protocols of care, response area and maximum time to response. Descriptive Statistics were used for demographics. Outcomes were compared by city and agency using c2 or Fisher's Exact tests.

Summary of Results Quantitative results. 17 pre-hospital service administrators were interviewed in Managua, Leon, Granada, Masaya and Chinandega. They report an average of 247 calls/day (range 0–3000) of which 15% required an ambulance, 34% could not be answered and 0.8% were transferred to another service. 35% of agencies do not have a treatment protocol. Of those services that have a written protocol, none were able to produce a copy on the day of the interview. The average maximum response time ranged from 10 minutes in Managua to 73 minutes in Leon. 71% of administrators require basic first aid training of their workers, 23% require advanced first aid and 6% report no minimum level of training.

Qualitative Responses Regarding Barriers. Our duty is to provide basic care, but there are limitations in terms of our resources," "We have a shortage of supplies… including an ambulance," "We sometimes work with our own bare hands".

Conclusions There is no standardization of pre-hospital care; many agencies do not have a treatment protocol. Minimum education and training is not equal among all agencies. Lack of equipment is a major barrier to the provision of high quality care pre-hospital care.

80 UNDERSTANDING THE CHALLENGES FOR TREATMENT OF HYPERTENSION IN RURAL VIETNAM

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10.1136/jim-d-15-00013.80

Purpose of Study Vietnam's health care system, like that of many developing countries, is in the midst of an enormous transition from dealing primarily with communicable diseases to treating chronic noncommunicable diseases (NCDs). Of these NCDs, heart disease and stroke together place a greater burden on morbidity and mortality than all other diseases combined. Untreated hypertension is one of the principal risk factors for cardiovascular disease. There is a relative dearth of information concerning rural Vietnamese people with hypertension and the unique barriers they face when trying to access care. The goal of this study is to identify these critical barriers.

Methods Used To learn more about these barriers we conducted 8 focus groups of 89 hypertensive participants in rural areas outside of Can Tho, Vietnam. The participants were questioned on their knowledge and beliefs regarding hypertension and health in general, and were also asked about their attitudes towards accessing care and modifying their lifestyles to combat hypertension. Three rural Vietnamese physicians were also interviewed on the barriers their patients face.

Summary of Results A lack of knowledge about hypertension combined with pessimistic attitudes towards lifestyle modifications, as well as financial stressors, were found to be persistent themes among the participants. Many participants felt unduly burdened by recent changes to the country's health insurance laws. Women in particular appeared less knowledgeable about their condition, perhaps due to social isolation resulting from demanding home lives. Many participants who worked as day laborers reported difficulty modifying habits related to stress and smoking, as well as acknowledging neglect of their health overall.

Conclusions The study participants revealed many unique barriers that prevented them from accessing care for their hypertension. A more complete understanding of barriers to accessing care and patient's perspectives on these barriers can help direct future health promotion efforts in Vietnam.

81 ASSESSMENT OF CLEAN WATER FACILITY USAGE AFTER EDUCATIONAL INTERVENTION AND WATER INFRASTRUCTURE IMPROVEMENTS IN A REMOTE HIMALAYAN SCHOOL

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10.1136/jim-d-15-00013.81

Purpose of Study To assess the effect of infrastructure development and increased education on usage of clean water facilities by students at a remote Himalayan School.

Methods Used A combination of Global Positioning System (GPS) tracking and video monitoring was used to asses water facility usage. Our study tracked 142 students over 13 days. Students were randomly selected and divided into cohorts: grades 3–5 (n=66), grades 6–8 (n=44), and grades 9–10 (n=32). Frequency of water facility usage, and usage with respect to toilet and dining area visits was assessed.

The GPS data was corroborated by video to assess rates of handwashing per water facility visit. Hidden cameras and introducing the GPS trackers as heart rate monitors were employed as methods to capture routine behaviour. Data was analyzed and compared to 2014 results.

Summary of Results In 2015, students visited a water facility 3.2 times per day on average, a 39% increase from 2014. Overall, handwashing after toileting increased from 10% to 18% and before dining increased from 12% to 35%. Grades 3–5 remained at 10% after toileting, and increased handwashing before dining from 11% to 32%. Grades 6–8 increased handwashing after toileting from 17% to 30%, and before dining from 20% to 38%. Grades 9–10 increased handwashing after toileting from 0% to 19%, and before dining from 4% to 39%.

Assessment of water facility usage showed that the new strategically located water facility installed in 2015 was the most frequently used of all water facilities at 37% of visits.

Conclusions The addition of a strategically-located water facility and increased health education has resulted in an overall increase in water facility usage, and in handwashing after toileting and before dining. Future planning of water and sanitation infrastructure can take into account the necessary location placement and integration with health education. Despite significant improvements overall, the youngest students in grades 3–5 did not improve handwashing after toileting, suggesting that educational modules targeted to this age group could improve healthy clean water practices.

82 DEMOGRAPHICS OF POST-BURN CONTRACTURE PATIENTS TREATED IN CAMBODIA

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Purpose of Study Post-burn contractures are prevalent in the developing world. The goal of this study is to determine the demographic characteristics of burn contracture patients treated in Phnom Penh, Cambodia to elucidate how these injuries occur and how they may be prevented in the future.

Methods Used Patients for this study were identified using the Children's Surgical Centre (CSC) online database. Search parameters included patients who had a surgical procedure performed at CSC from January 1, 2014 - June 30, 2015. Operations searched in the database included: burn contracture release (z plasty), acid burn procedure, flap, revision of flap, graft, revision of scar and skin graft.

Patients were excluded if their contractures were congenital or if a burn mechanism did not cause their injury. Patients registered in the database under multiple operation types were only counted once. Of the 216 patients identified, 82 were deemed eligible for this study. Patient records were used to determine the gender, province, age of incidence and the mechanism of burn.

Summary of Results Of the 82 patients identified 51% were female (n=42) and 49% were male (n=40). Patients presented from 18 out of the 25 provinces in Cambodia. The most represented provinces were Kampong Cham (18%, n=15) and Kampong Speu (13%, n=11). The age of incidence was most common during the first decade of life (83%). Where 29% of injuries occurred when the patient was <1 year of age (n=24) and 54% of injuries occurred between the age of 1–10 years (n=44).

The most prevalent mechanisms of injury included fire (39%, n=32) and hot water (20%, n=16). The most prevalent mechanism for patients burned when they were <1 year old was hot water (42%, n=10). Whereas, patients burned between the ages of 1–10 years old were primarily injured by fire (59%, n=26).

Conclusions Of the patients treated at CSC the majority were burned before they were 10 years old by hot water or fire. Open cooking fires are the traditional way to prepare food in the provinces. While patient charts lacked specificity in many cases, these results suggest that lack of supervision around open fires and boiling water may be a main contributor to these types of injuries.

83 MULTILINGUAL INTIMATE PARTNER VIOLENCE SCREENING AND RESOURCE CARD

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10.1136/jim-d-15-00013.83

Purpose of Study This project aims to provide a multilingual intimate partner violence (IPV) screening tool and a list of local, multilingual IPV counseling and shelter services for the API community of Seattle.

Methods Used A literature review found a few key points. First, studies have shown that IPV programs such as hotlines and shelters are effective in reducing survivors' fear, increasing self-efficacy, coping skills and helping survivors feel more supported. Second, screening can improve quality of life for IPV survivors. Third, subjective screening questions like, "Do you feel safe at home?" are not sensitive, and survivors prefer self-administered or written

methods rather than face to face questioning. The STaT screening tool was chosen for its 3 objective questions and up to 94.9% sensitivity. The card format was discussed with community partner API Chaya. The project was proposed to a behavioral health specialist, community health advocates, the Health Education Supervisor and Health Advocacy Manager at the International Community Health Services (ICHS) clinic in Seattle's International District.

Summary of Results A two-part card was created with the STaT screening tool on the top card and a list of three multilingual, local IPV resources on the bottom card. The top can be torn off and disposed of after use, which, with the business card size, makes it discreet and less likely to be found by an abuser. The card will be translated to API languages and distributed at the ICHS clinic and by ICHS community health advocates when they host health fairs, dance classes, visit with community members etc… A document about how to use the card was also given to the clinic.

Conclusions Collaboration between a community health clinic and a local IPV resource organization along with evidence based implementation strengthens the impact of this project. It provides IPV survivors with a screening tool that can be self-administered, and with acces to local, multilingual counseling and shelter services. The card will now be translated by the clinic, distributed in the International District of Seattle, and may soon be used by other ICHS clinics in different neighborhoods. This card is mainly targeted towards women because unfortunately there is a lack of research about and resources for IPV survivors who are men.

84 TEACHING GOOD COMPLEMENTARY FEEDING PRACTICES TO LOW-LITERACY HEALTH PROMOTORS IN PERU

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10.1136/jim-d-15-00013.84

Purpose of Study According to government data, 56.3% of children 3–36 months in the Cusco region are anemic, 18.2% of children under 5 are chronically malnourished, and 40.3% are at high risk for growth stunting. The aim of this intervention was to reduce stunting and anemia by improving child nutrition between 6–24 months. Our goal was to teach community health workers about the safe introduction of solid foods to complement breastmilk, so these women could teach their communities through small group presentations and targeted house visits.

Methods Used With the help of the educational non-profit Ayni Wasi, 13 health promotors elected by their communities were trained to understand and teach 4 objectives of complementary feeding: continuation of breastmilk until 2 years, the introduction of solid foods at 6 months, the importance of food diversity, and the safe preparation and storage of food. Based on WHO guidelines, we developed an interactive curriculum for low-literacy promotors including a powerpoint with picture-based explanations, a hands-on activity creating dishes using pictures of the foods from local markets, a cooking demonstration on making healthy purees, and a printed teaching aid to be used when teaching their communities.

Summary of Results Nine promotors from 9 different communities received the training. All were able to recount the 4 objectives after the training. All could identify the different food groups and explain their importance for infants' development. Pre- and post-tests with 6 true or false questions were given, with modest but non-significant improvements in the scores. In the weeks following the training, 3 promotors held presentations to reach a total of 30 community members and all 3 correctly recounted the 4 objectives during their presentations. 93% of community members trained were able to recount the 4 objectives. A formal evaluation with 10 picture-based questions will be conducted in September.

Conclusions The training increased awareness on optimal nutrition for infants 6–24 months. Promotors understand the importance of food diversity, can adequately explain how to choose foods for infants, and will lead cooking demonstrations in their communities. After the evaluation, a summary of knowledge gaps will be identified and those points will be re-taught throughout the year by Ayni Wasi.

85 FACILITY ASSESSMENT FOR MATERNAL AND NEONATAL HEALTH INTERVENTIONS IN RURAL NEPAL

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10.1136/jim-d-15-00013.85

Purpose of Study Despite Nepal's efforts to improve maternal and child health, certain rural areas still struggle to provide optimal care. As pregnancy, delivery, and the post-partum period are vital times during which ideal care is necessary, mothers and newborns are at increased risk if such care is not available. The intent of this study was to survey facilities in one remote region of Nepal to assess current antepartum, intrapartum, and postpartum care and determine future capacity for health care delivery.

Methods Used From February to August of 2015, we surveyed 16 rural health facilities in the Solu Khumbu district of Nepal. For each facility we completed a validated health facility assessment survey, which measures the availability of basic infrastructure, supplies, and trained staff to provide maternal and neonatal care services. Focus group discussions in each facility were also conducted to elicit local perceptions. Reporting of findings is descriptive.

Summary of Results 16/16 facilities surveyed offered antenatal care; 9/16 provided routine delivery and postpartum care. With regards to infrastructure and supplies, 13/16 facilities had electricity, 12/16 had running water, 11/16 had delivery beds, and 4/16 facilities offered emergency transportation. 3/16 facilities had functional delivery sets per government standards, 3/16 had supplies for vacuum deliveries, 1/16 had forceps, and 1/16 offered C-section. 9/16 facilities had neonatal resuscitation equipment, but only 1/16 reported knowing how to use it. When discussing trained staff, 14/16 facilities reported housing trained nurse midwives, 8/16 had staff trained in the management of birth asphyxia, but only 2/16 felt that their training was

adequate. In focus group discussions, 75% of responding providers reported that their facilitiy's greatest need was increased training and equipment for delivery care.
Conclusions Many health facilities in the Solu Khumbu district lack the capacity to provide basic and emergent antepartum, intrapartum, and postpartum care. Future investments in training and basic supplies for deliveries could significantly improve maternal and child health care in these communities.

86 COMMUNITY PERCEPTIONS AND KNOWLEDGE OF MENTAL ILLNESS IN RURAL KENYA

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Purpose of Study Despite medical advances in psychiatry and the development of effective treatments for psychiatric conditions, many individuals living in rural Kenya fail to seek help for mental health issues. Individuals residing in these areas face numerous barriers that prevent them from accessing mental health services, including community stigma towards mental illness. The aim of this study was to investigate community knowledge, beliefs and practices surrounding mental illness in order to develop community-based interventions to address the gaps in mental health care within the region.
Methods Used This study used focus group discussions and key informant interviews to assess community knowledge and attitudes on mental health. Five focus groups were conducted within the Kisumu region. Three focus groups were conducted with women, one with Community Health Workers (CHWs), and one with men. Facilitators asked general questions about mental health and questions related to case-based vignettes that described different mental illnesses. Key informant interviews were conducted with a psychologist, a school headmaster and a faith healer.
Summary of Results We found that community members had received little education about mental illness, health care treatments or providing support for those suffering from a mental illness. Participants addressed significant barriers to accessing mental health care, including long distances to access tertiary hospitals, a scarcity of qualified professionals, and financial constraints. Furthermore, while participants generally approached mental illness from a physiological standpoint, many had cultural interpretations about the etiology of mental illness, and often associated mental disorders with black magic or demon possession.
Conclusions We identified numerous barriers to mental health care and a variety of perspectives on mental illness in the Kisumu region. Lack of education about mental health topics contributed to significant stigma associated with mental illness, which has been exacerbated by the association of mental illness with the supernatural. In the future, this data will be used in order to develop mental health education workshops for CHWs to deliver to members of the community.

87 IMPROVING THE HEALTH OF WOMEN & CHILDREN IN MIGRANT COMMUNITIES

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10.1136/jim-d-15-00013.87

Purpose of Study Migrant communities face many challenges that put them at increased risk for poor health, including extreme poverty, chronic food insecurity, and a lack of a medical home. The purpose of this study is to identify the acute and chronic health-related problems of the migrant communities within Sinor Taluka, Gujarat, India.
Methods Used Measurements were taken over a one-month period in March 2015 from migrant communities within Sinor Taluka, Gujarat, India. All family members were included in the demographic measurements, which included members of family within the household, name, age, length of time spent within Sinor Taluka, daily household income, access to healthcare and barriers to healthcare access, and place of origin. Anthropometric measurements of infants, children, and women in childbearing age were taken. The immunization status of infants and children was assessed, and a pediatric trained provider performed a clinical exam according to IMCI guidelines. Any signs of acute disease were reported, including acute respiratory illness, fever, and diarrhea within the last 2 weeks, as well as clinical signs of anemia. History of birth complications and infant mortality was also assessed in women in childbearing age.
Summary of Results In total, data from 86 children and 26 women in childbearing age were obtained from 21 families. Fifteen families report minimal or no access to healthcare. The unimmunized rate was 81% among migrant families. Of the 86 children measured, the mean z-score for weight for age was –3SD (60.5% of the total population studied). In the less-than–5 year old population (26/86), 40% were severely acutely malnourished (–3SD for weight/height); mean z-score for weight-for-length and weight-for-age of the less-than-five year olds was –3SD. Of the 26 women measured, the average age was 28.8 years old, average weight of 48 kg, average height 151.4 cm, and mean BMI 20.2. Of the 26 women measured, 26% were severely acutely malnourished with a BMI <18.5.
Conclusions The quality of health among women and children in the migrant communities is well below the reported average among rural families. Severe acute malnutrition in particular is a major concern.

88 A COMMUNITY-DRIVEN PILOT PROGRAM TO INCREASE BASIC PEDIATRIC HEALTH KNOWLEDGE AMONGST CHILD CARETAKERS IN KARAGITA, KENYA

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10.1136/jim-d-15-00013.88

Purpose of Study Poor child health outcomes are prevalent in Karagita, a slum in rural Kenya. Common pathologies include pneumonia, diarrhea/dehydration, and

malnutrition. To address this, local community health volunteers (CHVs) proposed to educate parents and teachers on prevention and recognition of these diseases. CHVs also proposed a quality standard by which different babycare centers (BCCs), early childhood development centers (ECDs), and primary schools could be compared. Recent literature highlights the efficacy of such health initiatives driven by community leaders.

Methods Used Utilizing Kenyan and international guidelines, a curriculum covering pediatric hygiene, nutrition, early signs of illness, and child development was designed targeting Karagita parents and teachers. CHVs facilitated workshops for volunteer participants, assessing participant knowledge before and after the workshop. As an incentive, participants were given certificates of completion. A BCC/ECD/primary school audit form was designed, and CHVs graded selected schools. Grades were made public and tracked to note any improvements over time. Non-local involvement in this initiative was phased-out gradually by training CHVs on workshop and audit facilitation as well as distributing bound workshop materials to all trained CHVs.

Summary of Results Four workshops were held with assistance from three CHVs, with 58 total participants. Thirty-three participants (self-identified: 11 teachers and 23 parents) completed the entire four-hour workshop. The average score increased 13.3% between pre- and post-workshop assessments. Nine schools were audited twice over eight days, with one school showing improvement. Ten CHVs were trained on how to facilitate future workshops/audits and received bound workshop materials.

Conclusions Workshop participants demonstrated increased pediatric health knowledge. CHV workshop facilitators and participants commented on the novel space created to discuss child health. Field reports indicate that BBCs/ECDs/primary schools responded positively to the audits, and wanted more time to "improve their grade." Future plans include carrying out workshops and audits for three more months before re-evaluation. Overall, this pilot project yields some positive outcomes and is strongly endorsed by the community.

Hematology and Oncology I
Concurrent Session
3:30 PM
Thursday, January 28, 2016

89 REGION OF INTEREST IDENTIFICATION AND DIAGNOSTIC ACCURACY IN BREAST PATHOLOGY

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Purpose of Study Errors in breast cancer detection are the leading cause of malpractice lawsuits in the United States. These errors have serious implications for patients and the medical field. Research into improvements in detection methods and technologies is crucial.

Breast biopsy interpretation requires identifying relevant histopathological features and accurately relating them to diagnostic categories. The precise relationship between feature identification and diagnostic decision-making is still unknown. In this study, participant pathologists identified the primary diagnostically significant region of interest (ROI) on digital breast pathology slides as they made their diagnoses. We compared those ROIs to those marked by a consensus panel of 3 expert breast pathologists, hypothesizing that greater overlap between participant and consensus panel ROIs is associated with higher diagnostic agreement.

Methods Used 3 experienced breast pathologists marked diagnostic ROIs and established consensus diagnoses for 180 digital breast pathlology slides. 44 participant pathologists independently marked ROIs on and diagnosed subsets of the same digital images using the same computer interface. Pathologists' ROIs and diagnoses were compared to those of the consensus. Correlations between diagnostic agreement and percent ROI overlap were calculated while examining possible confounding and effect modification.

Summary of Results 44 pathologists participated, each interpreting between 54 and 60 cases for a total of N=1,972 assessments. A significant, positive correlation between percent ROI overlap and diagnostic agreement was found. At 100% ROI overlap, odds of diagnostic agreement were over 7 times greater than without overlap. Case characteristics associated with higher overlap included increased breast density and higher severity diagnoses. Odds of diagnostic agreement remained significant after adjusting for case characteristics.

Conclusions When pathologists focus on the same diagnostic ROI, they are more likely to place the lesion in the same diagnostic category. These findings suggest that tools that highlight potential regions of interest like computer-aided detection could improve pathologists' diagnostic accuracy when interpreting breast pathology cases.

90 A NOVEL PEPTIDE-CONJUGATE THAT ACCUMULATES IN SARCOMA FLANK TUMORS AND PREVENTS TUMOR CELL GROWTH IN VITRO

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10.1136/jim-d-15-00013.90

Purpose of Study Antibody-drug conjugates (ADCs) have been FDA approved for the targeted delivery of chemotherapy to tumors. However, ADCs are limited by their poor penetration into solid tumors and inability to cross the blood-brain-barrier. It has been demonstrated that certain peptide-dye conjugates such as chlorotoxin-Cy5.5 are not limited in these ways. However, chlorotoxin-Cy5.5 accumulates in mouse liver - a potential liability if used as a peptide-drug conjugate. We sought to identify a novel peptide that is capable of delivering chemotherapy specifically to tumor cells *in vitro* and *in vivo*.

Methods Used We studied the biodistribution of a number of small peptides, particularly their accumulation in tumors compared to other healthy tissues. We utilized nude mice bearing human sarcoma flank xenografts (RH28 and A673

cell lines). Mice were injected intravenously with peptide-dye conjugate. Accumulation was quantified in ten tissues using IVIS imaging (n=3–5). Radiolabeled peptide was also used to track tissue distribution. Finally, we generated peptide-drug conjugates with MMAE (monomethyl auristatin E), a potent anti-mitotic drug, to evaluate the ability to inhibit the growth of cancer cells *in vitro*.

Summary of Results We identified a novel peptide conjugate, LCMI-II, which accumulates in sarcoma flank tumors 12-fold greater than liver. Additionally, we showed that tumor accumulation occurred for 14C-methylated LCMI-II peptide, which was maintained up to 24 hours following injection. Intracellular accumulation of LCMI-II was verified by microscopy, and was prevented by EIPA, an inhibitor of macropinocytosis. Additionally, we found that the peptide-drug conjugate, LCMI-II-MMAE potently inhibited the growth of a number of human tumor cell lines *in vitro*.

Conclusions LCMI-II accumulates and persists in mouse sarcoma xenografts. *In vitro* data suggests macropinocytosis is involved in this accumulation. LCMI-II-MMAE conjugates are able to potently inhibit the growth of a number of tumor cell lines *in vitro*. Peptide-drug conjugates such as this one may be a way to increase the therapeutic index of cytotoxic chemotherapy.

91 DEPYROGENATED CHITOSAN AND IL–12 CURE SUPERFICIAL BLADDER CANCER IN A MURINE MODEL

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10.1136/jim-d-15-00013.91

Purpose of Study Chitosan and Interleukin 12 (IL–12) were shown to be highly effective against superficial bladder cancer by a laboratory at the National Cancer Institute (NCI) in 2008 (Zaharoff *et al*.). Their results were so impressive that the NCI had begun preparing for a clinical trial to test the therapy in human patients. However, the trial got stopped due to concerns regarding the sterility and pyrogenicity of the commercially available chitosan the NCI was using. This therapy was stalled until our partner, Scion, obtained an NCI grant to demonstrate that our chitosan is sterile, depyrogenated, and still functional after nitrogen plasma decontamination.

Methods Used Superficial bladder tumors containing a light-emitting gene were successfully implanted in 37 mice. Of these 37 mice, 12 were treated with saline, 14 were treated with plasma- decontaminated chitosan and IL–12, and 11 were treated with non-plasma treated chitosan and IL–12. The mice were given a series of five Chitosan and IL 12 treatments over the course of 8 weeks. After their treatment course we re-challenged the "cured" mice by implanting more bladder cancer cells to test the recurrence.

Summary of Results The attached images show a representative animal from each treatment group. We found that all 100% of the saline treated mice died within 8 weeks to tumor cell injection, whereas 100% of the chitosan+IL–12 treated were still alive 8 weeks after tumor cell injection. Additionally, 93% (13 of 14) of the plasma-treated chitosan+IL–12 mice were tumor negative at 8 weeks post-tumor cell injection and 91% (10 of 11) of the non-plasma treated mice were tumor negative at 8 weeks.

Conclusions Our results mimic those found at the NCI in which CS+IL–12 dramatically prolongs the lives of the tumor-bearing mice and cures at least 90% of them. Our results indicate that chitosan decontaminated with non-thermal nitrogen plasma both sterilizes and depyrogenates chitosan while maintaining its functional efficacy. One of the major problems with the current superficial bladder cancer therapy (BCG) is the 30–50% 5 year recurrence risk. We noticed that treating mice with Chitosan and IL–12 prevents the re-implantation of tumor cells in 85% of the mice. We would like to expand our study in order to test the effectiveness of Chitosan and IL–12 environments such as pancreatic, colon, and breast cancers.

92 DISPARITIES IN THE PRESENTATION AND TREATMENT OF NON-SMALL CELL LUNG CANCER: A STUDY COMPARING A COUNTY FACILITY WITH A SPECIALIZED CANCER CENTER

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10.1136/jim-d-15-00013.92

Purpose of Study In the treatment of cancer, survival outcomes are often dependent on access to care. This study aims to elucidate the differences in medical care between patients presenting to Los Angeles County Hospital (LAC+USC), a county hospital dedicated to the underserved, and to those presenting to the University of Southern California Norris Comprehensive Cancer Center (Norris), a private, specialized cancer hospital.

Methods Used Patients treated for non-small cell lung cancer between 2000 and 2014 at both LAC+USC and Norris were retrospectively studied. The list of patients for each institution was obtained through the tumor registry. In total, 820 charts were reviewed from LAC+USC and 548 charts from Norris, of which 455 and 267 charts, respectively, met inclusion criteria and were used in this study.

Summary of Results The median age of patients at LAC+USC was 59 while the median age of patients at Norris was 68. At the time of presentation to LAC+USC, only 7% of patients had stage I disease while 74% had stage IV disease. In comparison, at Norris, 23% of patients had stage I disease and 46% had stage IV. The average time to presentation from the onset of symptoms was 56.4 and 45.0 days at LAC+USC and Norris, respectively ($p=0.114$). The average time from initial symptoms to tissue diagnosis was 105 days at LAC+USC and 113 days at Norris ($p=0.495$). The average time from diagnosis to initial therapy was 68.8 days at LAC+USC compared to 42.6 days at Norris ($p<0.0001$). The average time from diagnosis to death in patients with stages I-III disease was shorter at 369.7 days at LAC+USC compared to 708.5 days at Norris ($p=0.0009$). Similarly, patients with stage IV disease survived on average 247.7 days at LAC+USC and 467.3 days at Norris ($p<0.0001$) after diagnosis. Survival was worse for male patients (HR 1.571) and those who received treatment at the county facility (HR 1.265).

Conclusions Patients who presented to the county hospital were not only younger, but also presented with more

advanced stage disease than those at the cancer center. This is likely a strong contributor to the significantly shorter time between diagnosis and death in the county population in patients with both early and late stage disease.

93 CLOSING THE GAP: ONLINE ONCOLOGY RESOURCES FOR MEDICAL STUDENTS

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10.1136/jim-d-15-00013.93

Purpose of Study The majority of practicing physicians will encounter cancer patients yet, many physicians lack training in cancer prevention and detection techniques due to deficits in education during medical school. There is need to develop new teaching resources to support oncology education. This project aims to develop online learning modules to enhance oncology education for medical students.

Methods Used Online learning resource development began in 2008. The curriculum design framework of Kern and Tyler was used, and included a general literature review, targeted needs assessment and curriculum deliberation with an expert interdisciplinary team. Website development began in 2009 with a team of medical students and oncologists. Kirkpatrick's evaluation framework has been used to modify the online materials.

Summary of Results During the curricular design phase, a general and targeted needs assessment confirmed deficit in oncology undergraduate education. A targeted needs assessment of 186, 3rd and 4th year medical students, noted 41% of students had not interacted with cancer patients during clerkship years and 62% felt their oncology education was poor or fair relative to other subjects. 80% of students felt case-based online modules would benefit their clinical education. Analysis of the local curriculum revealed exposure to oncology was sporadic and discipline specific. The needs assessment provided critical information for the curriculum design work.

Website development began with scripting of tumor specific modules. By 2014, 14 online modules, 11 virtual patients, and a self-assessment mobile application were implemented with cyclic evaluation and revision. In 2015, 7 virtual whiteboard videos were produced, and PDF modules were introduced.

Evaluation data demonstrated improved oncology knowledge, clinical preparation and educational flexibility in graduating learners.

Conclusions This project contributed to the systematic development of an online oncology curriculum. Evaluation data demonstrated positive impact on undergraduate medical education and can be integrated with other initiatives. The next steps involve evaluation of the whiteboard videos and professional editing. Integration of these resources into the medical school curriculum will generate more evaluation data for resource improvement.

94 INVESTIGATING THE RELATIONSHIP OF BILE ACIDS AS TUMOR SUPPRESSING AGENTS IN COLORECTAL ADENOCARCINOMA

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10.1136/jim-d-15-00013.94

Purpose of Study Colorectal cancer is the 3rd most common and 2nd leading cause of death from cancer in the United States. A high-fat diet increases colon cancer risk since it causes a rise in secondary bile acids such as the tumor promoter deoxycholic acid (DCA). In fact, DCA activates pathways important in cancer progression such as the mitogen-activated protein kinase (MAPK) pathway. In addition, DCA accelerates a negative selective pressure thru apoptosis, creating a growth advantage in cancer cells. Furthermore, research shows that this induction of apoptosis and mitogenic signaling is regulated via calcium. In contrast, the bile acid ursodeoxycholic acid (UDCA) is a chemopreventive agent that inhibits the signaling activities of DCA. However, the mechanism by which UDCA causes suppression is not understood. We will examine if UDCA blocks DCA-induced intracellular calcium as well as investigate if UDCA suppresses the calcium related signaling molecule calcium/calmodulin-dependent protein kinase II (CAMK II).

Methods Used Human colorectal adenocarcinoma cells cultured for 24 hours then serum starved overnight and pretreated with UDCA. Cells then treated with or without the calcium inhibitor BAPTA/AM followed by treatment with DCA or ionomycin. Cell lysates harvested and western blot performed to examine for phosphorylated CAMK II or ERK 1/2. Apoptosis determined using the annexin V/PI assay. Flow cytometry performed using the BD FACSCanto II.

Summary of Results UDCA does not block DCA-induced calcium influx but does suppress CAMK II phosphorylation.

Conclusions UDCA may block mitogenic signaling as well as inhibit apoptosis by impeding calcium related signaling by DCA. Thus, these studies have elucidated one possible mechanism of UDCA's chemopreventive actions. Consequently, future directions include screening patients with high levels of DCA and examining them for overactivation of CAMK II as a better way of identifying those patients who would respond well to UDCA chemoprevention.

95 HEMOGLOBINOPATHIES, DIABETES, AND AMERICAN INDIANS AND ALASKA NATIVES

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Purpose of Study American Indian and Alaska Natives constitute about 1% of the general public or about 2.9

million people in the United States. Within this subpopulation, rates of type 2 diabetes are estimated at 16.1% with another 30% estimated to have pre-diabetes. This translates to roughly 1.3 million people that have, or are at risk for, diabetes. Previous research has demonstrated abnormal hemoglobin may result in hemoglobin A1C readings that are not indicative of true disease state, resulting in missed diagnoses. The goal of this study was to determine the percentage of American Indian and Alaska Natives born in Nevada with hemoglobinopathies. The results will increase awareness of interactions between hemoglobin and diabetes in older asymptomatic carrier individuals born before universal screening.

Methods Used Nevada Newborn Blood Spot Screening results from 2005–2012 were compared with data from the Nevada Division of Public and Behavioral Health to calculate rates of hemoglobinopathies in American Indian and Alaska Natives born in Nevada during this timeframe.

Summary of Results American Indian and Alaska Natives accounted for 12 of 2069 (0.5%) of all hemoglobinopathies in Nevada newborns between 2005 and 2012. Seven tested positive as a thalassemia carrier, four as a sickle cell carrier, and one was a carrier of hemoglobin C. Three thousand four hundred and eighty-two American Indian children were born during these years, of which 0.34% had a hemoglobinopathy.

Conclusions The rate of 1 hemoglobinopathy per 290 American Indian and Alaska Native births was more common than the 1 in 503 births for whites. If the Nevada rates were constant across the United States, over 4,500 American Indians could be receiving improper diabetes care. If red blood cell turnover is more rapid, then A1C results will overestimate average blood glucose levels over the previous 90 days and could lead to treatment causing hypoglycemia. Conversely, some hemoglobinopathies will result in underestimation of average blood glucose levels. While hemoglobinopathy rates are low, physicians confounded by older American Indian patients whose clinical symptoms do not match A1C results might consider hemoglobin typing to help improve outcomes.

96 INDICATIONS FOR POST-MASTECTOMY RADIATION (PMRT) FOLLOWING NEOADJUVANT CHEMOTHERAPY (NAC) IN YPN0 AND YPN1–3 AXILLARY NODE POSITIVE WOMEN

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10.1136/jim-d-15-00013.96

Purpose of Study Downstaging with NAC may obscure indications for PMRT. The degree of downstaging, if any, which results in local-regional recurrence rates low enough to omit PMRT remains controversial and is being explored in randomized trials. We examined the rate of local-regional recurrence (LRR) in women receiving contemporary neoadjuvant chemotherapy (NAC) who underwent mastectomy without PMRT in order to identify a subgroup that could benefit from radiation.

Methods Used From 2004–2013 83 women with stage I-IIIA breast cancer received neoadjuvant chemotherapy and underwent mastectomy with sentinel node biopsy or axillary dissection. All Her2+ patients received trastuzumab. All hormone receptor (HR) positive women received adjuvant endocrine therapy. 60% were clinical N0 and 40% were N1. Median age was 46 years. Receptor status was HR+ Her2–42%, HR+Her2+ 27%, triple negative (TN) 23% and HR-Her2+ 8%. 70% had BRCA testing and 28% were BRCA+. Factors analyzed for association with LRR included receptor status, histologic grade, LVI, BRCA status, clinical N status, and treatment response. Median follow-up was 3.4 yrs. LRR is reported as cumulative incidence.

Summary of Results Following NAC, LRR was in 3% pCR, 11% ypN0, 15% ypN1–3+. There was 7 LRR with no distant disease (5 chest wall, 1 axillary, 1 supraclavicular node). The 5 yr. CI of LRR was 10%. The presence of LVI in node+ pts. resulted in a 66% LRR rate compared to 0% for ypN0. LRR for grade 3 tumors was 0% pCR, 11% ypN0 and 100% ypN1–3+. LRR rates by receptor status were 6% ER+Her2-, 22% HR+Her2+, 0% TN, and 0% ER-Her2+. Despite trastuzumab and adjuvant endocrine therapy, LRR occurred in 15% of the ypN0 and 22% of the ypN1–3+ HR+Her2+ women. In contrast, there were no LRR in the HR+Her2- ypN1–3+ patients.

Conclusions This study is unique in that all Her2+ patients received trastuzumab and LRR was analyzed by response to treatment, clinicopathologic factors and receptor status. Grade 3 and LVI were predictive for recurrence in node positive women. HR+Her2+ pts appeared to have less benefit in terms of decreased LRR with downstaging compared to the other receptor subgroups despite contemporary systemic therapy. PMRT should be considered in these women.

97 RETROSPECTIVE STUDY OF METASTATIC MELANOMA AND RENAL CELL CARCINOMA TO THE BRAIN WITH MULTIVARIATE ANALYSIS OF PROGNOSTIC PRE-TREATMENT CLINICAL FACTORS

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10.1136/jim-d-15-00013.97

Purpose of Study Patients with brain metastasis from renal cell carcinoma (RCC) or melanoma have very poor prognoses of three months and less than one month if left untreated, respectively. These tumors are considered to have histologies resistant to radiation therapy. Stereotactic radiosurgery (SRS) is an effective treatment modality for these tumors. This study analyzes prognostic factors for overall survival (OS) times in a case series of RCC and melanoma patients with metastasis to the brain treated with SRS.

Methods Used 122 patients with a diagnosis of brain metastases and primary cancer of either renal cell carcinoma or melanoma were grouped by age at brain metastasis diagnosis, whether or not they received WBRT, whether or

not they underwent resection, KPS value, number of brain metastases, and primary tumor histology. Survival rates were determined and compared for all groups. Univariate and multivariate analyses were performed to determine if these factors were significant for OS.

Summary of Results Median survival times for melanoma patients and RCC patients were 8.20±3.06 months and 12.70±2.63 months respectively. On univariate analysis, patients with >5 metastases had a significantly shorter median survival time (6.60±2.45 months) than the reference group (1 metastasis, 10.70±13.40 months, p=0.024). Patients with KPS=≤60 experienced significantly shorter survival than the reference group (KPS=90–100), with median survival times of 5.80±2.46 months (p=<0.001) and 45.20±43.52 months, respectively. Results were significant in multivariate analysis, with KPS=70–80 also being a significant factor for shorter survival when compared to the reference group (p=<0.001).

Conclusions SRS is a safe and effective treatment for intracranial RCC and melanoma. We found a survival rate of 12.7 months and 8.2 months for RCC and melanoma, respectively. The 2 and 5 year survival rates were 26% and 8%, respectively. Treatments ought to be personalized for each patient. Our study determined number of brain metastases (>5, p=0.024) and KPS (p=0.001) to be statistically significant factors in OS prognosis.

98 TEXT MESSAGING BASED INTERVENTION FOR IMPROVING RECEIPT OF SURVIVORSHIP CARE FOR ADOLESCENT AND YOUNG ADULTS (AYAS): A QUALITATIVE STUDY

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10.1136/jim-d-15-00013.98

Purpose of Study To explore the acceptability and feasibility of two-way Short Message Service (SMS) text messaging intervention for improving AYA receipt of survivorship care.

Methods Used AYA survivorship research team partnered with computer-science research team investigating mobile health technologies to explore the usability, acceptability, and feasibility of a text-messaging intervention in AYA survivors. Qualitative data collection and constant comparative analytic approach exploring in-depth themes was conducted to tailor the text messaging system and assess its usability in subsequent versions. 4 AYAs participated in a focus group; 23 AYAs completed key informant interviews.

Summary of Results Focus group identified the acceptability and modifications for SMS v.1.0 with the following themes: text messaging is age appropriate; can simplify multiple recommendations for survivorship care; can personalize survivorship care recommendations; can link AYAs with each other and to community resources. AYA key informants described SMS system v.2.0 and v.3.0 with the following themes: text messaging encouraged active health monitoring; increased utilization of survivorship resources; empowered AYA survivors. AYA identified future directions for the text messaging system with the following themes: supplementing standard survivorship care plans; forming AYA survivor social networks; partnering actively with healthcare team.

Conclusions Text message-based intervention offers an age-appropriate, personalizable and flexible means of improving receipt of survivorship care to AYA survivors. For cancer survivors, a text message-based intervention can improve the receipt of and simplify survivorship care.

Neonatal Pulmonary II
Concurrent Session
3:30 PM
Thursday, January 28, 2016

99 SEX-SPECIFIC PERINATAL NICOTINE EXPOSURE-INDUCED AIRWAY PHENOTYPE IN MEDIATED BY DIFFERENTIAL PKC ISOFORM EXPRESSION IN MALES AND FEMALES

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10.1136/jim-d-15-00013.99

Purpose of Study We have previously determined that perinatal nicotine exposure results in airway hyperresponsiveness differentially in males. However, the underlying mechanisms remains unknown. Since PKC activation is known to determine airway smooth muscle (ASM) cell differentiation, and since nicotine-mediated Wnt activation is mediated via PKC activation, we hypothesize that sex-specific PKC isoform expression and activation in ASM cells determine nicotine's differential sex-specific airway hyperresponsiveness.

Methods Used Time-mated, first-time pregnant, Sprague Dawley rat dams received either diluent or nicotine [1 mg/kg, s.c.] in 100 μl volumes daily from embryonic day 6 to postnatal day (PND) 21, when airway contractility (α-smooth muscle actin, fibronectin, & collagens I and III) and PKC isoform protein levels were determined using Western analysis and immunofluorescence. ASM cells were cultured from male and female tracheas separately and treated with nicotine (10^{-9}M) for 24h. PKC activation, DNA methylation, and using co-immunoprecipitation, physical interaction between DNMT1 and PKC were determined.

Summary of Results PKC activation was observed only in male tracheas exposed to nicotine. Cultured ASM cells from PND21 rats, treated with nicotine showed significant increases in myogenic markers such as α-SMA and fibronectin, and Wnt activation in males only. There was greater abundance of PKC isoforms δ and θ in ASM cells of males that further increased with nicotine stimulation. Nicotine-mediated PKC activation was associated with DNMT1 phosphorylation; pretreatment with pan-PKC inhibitor blocked DNMT1 phosphorylation, indicating that the nicotine-mediated DNMT1 activation and its downstream effects on ASM cell differentition and function might be determined by differential PKC isoform activation in males.

Conclusions Our data provide novel mechanistic insights for the male gender specificity of nicotine-induced airway

hyperresponsiveness. Nicotine-mediated DNMT1 activation is regulated by PKC and there is physical interaction between DNMT1 and PKC that mediates PKC's downstream effects. We speculate that PKC modulators might prevent perinatal nicotine-exposure-induced lung phenotype, specifically in males (Grants:NIH HD51857, HD71731; TRDRP 23RT-0018).

100 INTRAUTERINE GROWTH RESTRICTION INCREASES ESTRODIAL LEVELS IN RAT LUNG

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10.1136/jim-d-15-00013.100

Purpose of Study Intrauterine growth restriction (IUGR) increases the risk of neonatal lung disease and impairs lung development, often in a sex-specific manner. Lung development depends upon the transcription factor PPARγ. PPARγ expression and signaling is repressed by estrogen receptor alpha (ERα) binding to response elements on the PPARγ gene. We previously demonstrated, in the rat, that IUGR decreases PPARγmRNA and protein levels, as well as downstream targets of PPARγ in newborn rat lungs. We also demonstrated alterations in circulating estradiol. However, the effects of IUGR on lung ERα expression and lung estradiol levels remain unknown. We hypothesize that IUGR increases ERα expression and lung estradiol levels in newborn rat lung.
Methods Used IUGR was induced by bilateral uterine artery ligation at day 19.5 of gestation in Sprague Dawley rats. Lungs of IUGR male and female newborn rat pups were compared to sex-matched controls. ERα mRNA and protein levels were measured in lung homogenate using real-time RT PCR and western blotting respectively. Lung estradiol levels were measured by ELISA.
Summary of Results IUGR did not affect lung levels of ERα mRNA or protein in male or female lungs. IUGR significantly increased estradiol levels in male (163±39%) and female (166±58%) lungs, compared to sex-matched controls. ERα mRNA levels, ERα protein abundance, and lung estradiol were not different between male and female control rat lungs.
Conclusions IUGR increases lung estradiol levels, but not ERα expression in newborn rat lung. We speculate that increased lung estradiol levels may increase ERα signaling in the lung, resulting in repression of PPARγ expression. We are currently examining ERα binding to the PPARγ gene in rat lung using chromatin immunoprecipitation.

101 ANALYSIS OF NOTCH PATHWAY COMPONENTS IN LUNG INNATE IMMUNITY CELLS IN PRETERM INFANTS

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10.1136/jim-d-15-00013.101

Purpose of Study Bronchopulmonary dysplasia is a common morbidity in preterm infants. The underlying molecular mechanisms remain poorly understood. Dysregulation of innate immunity genes may contribute to pathogenesis of BPD. The Notch pathway functions in many processes including lung development and T-cell differentiation. It consists of transmembrane receptors Notch1 through Notch4 and ligands Delta-like (Dll) and Jagged (Jag). These interactions lead to altered gene expression. The role of Notch in innate immunity of preterm infants has not been described. Here, we examined expression of Notch pathway components in innate immunity cells from lungs of mechanically ventilated preterm neonates.
Methods Used Samples of tracheal aspirate fluid (TAF) were obtained according to IRB protocol during routine suctioning of intubated neonates of various gestational ages (GA). When possible, additional samples were obtained at different time points from same patients. Total cells in TAFs were used for RNA isolation. PCR using primers for Notch pathway components Notch1, Notch2, Notch3, Jag1, Jag2, DLL1 and DLL2 was used to analyze their expression.
Summary of Results At time of abstract submission, preliminary analysis of multiple samples from 8 preterm infants was completed. Nearly all samples revealed robust expression of two Notch receptors, Notch1 and Notch2. Other Notch pathway components including Notch3, Jag1, Dll1 and Dll2 were expressed dynamically in various samples. No expression of Jag2 was found. Preliminary gene array analysis of FACS-isolated lung macrophages revealed a 44 fold increase in Notch2 between a 24 week GA infant and a 30 week GA infant on day 3 of life. Both Notch1 and Notch3 decreased in the 30 week preterm infant.
Conclusions Notch is a major signalling pathway, both during development and in disease processes. While some information regarding expression & function of Notch in adults exist, little information is available in preterm lung inflammatory cells. We show that most Notch components are expressed in cells from the lungs of human preemies. Their pattern of expression suggest they may be critical in regulating the inflammatory response in the lungs of neonates born prematurely.
Supported By: NHLBI and the Hastings Foundation.

102 INSULIN-LIKE GROWTH FACTOR–1 DOWNSTREAM SIGNALING IS DISRUPTED IN THE LUNG BY PREMATURE BIRTH AND PROLONGED MECHANICAL VENTILATION OF PREMATURE LAMBS

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10.1136/jim-d-15-00013.102

Purpose of Study Insulin-like growth factor–1 (IGF–1) mRNA expression is increased in lungs of premature human infants and premature lambs with evolving neonatal chronic lung disease. A consequence of increased IGF–1 expression is increased cell proliferation, particularly among mesenchymal cells in distal airspace walls. We recently reported that daily treatment with an IGF–1 receptor antagonist (*antag*) during invasive mechanical

ventilation (IMV) leads to thinner, less cellular distal airspace walls and better gas exchange compared to IMV alone. Conversely, daily treatment with an IGF–1 receptor agonist (*agon*) during non-invasive ventilation (NIV) via the nose leads to thicker, more cellular distal airspace walls and worse gas exchange compared to NIV alone. We asked whether either IGF–1 receptor intervention correspondingly affects cell proliferation molecules downstream along the IGF–1 signaling cascade.

Methods Used Lung tissue was used from four premature lamb groups: (1) IMV alone (bad lung outcomes), (2) NIV alone (good lung outcomes), (3) IMV plus IGF–1R *antag* (better lung outcomes than IMV alone), and (4) NIV plus IGF–1R *agon* (worse lung outcomes than NIV alone). We used quantitative real-time RT-PCR to quantify c-Myc and TGF-β mRNA level, and immunoblot to quantify PCNA protein abundance.

Summary of Results Normalized mRNA level ($2^{-\Delta CT}$) for c-Myc and TGF-β was not different between respective groups at the end of 3d of respiratory support (data not shown). Normalized abundance of PCNA protein was significantly lower in the IMV plus IGF–1R *antag* group (1.1 ±0.2; mean±SD; $p<0.05$) compared to the IMV alone group (1.8±0.2). Conversely, PCNA abundance was significantly higher in the NIV plus IGF–1R *agon* group (1.5 ±0.2; mean±SD; $p<0.05$) compared to the IMV alone group (1.0±0.1).

Conclusions Our results provide mechanistic support that increased molecular signaling downstream of IGF–1 in the lung is causally involved in poor lung outcomes in premature lambs that are supported by invasive MV. HL110002, HL062875, HL07744.

103 A 3-DIMENSIONAL HUMAN MODEL OF BRONCHOPULMONARY DYSPLASIA DEMONSTRATES NOTCH MEDIATED PATHOPHYSIOLOGY

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10.1136/jim-d-15-00013.103

Purpose of Study Bronchopulmonary dysplasia (BPD) is a leading cause of morbidity in premature infants. While there are experimental animal models that approximate BPD with environmental exposures, there is currently no comparative human model of BPD. The overall goal is to create a disease model of BPD in order to investigate the cellular pathways involved in the disease pathophysiology.

Methods Used 21-week gestation human fetal lung fibroblasts (FLF) were cultured on 2D plates or on alginate beads to form 3D organoid structures. The organoids were exposed to a hypoxia-hyperoxia model of BPD. Comparisons in gene expression patterns and histology were made using quantitative real-time PCR (qPCR), immunofluorescence, and H&E staining.

Summary of Results In the 3D model, FLFs exposed to hypoxia and hyperoxia demonstrated fibroblast proliferation by brightfield microscopy and increased α-SMA expression by immunostaining. qPCR analysis showed expression profiles of 10 targets consistent with known expression patterns in BPD, including α-SMA, TGFβ, collagen, PDE5, and elastin. These findings were specific to the FLFs in the 3D model in hypoxia-hyperoxic conditions; they were not seen in normoxic controls, in 2D models, or in 3D constructs made from neonatal skin fibroblasts. Exposure to hypoxia-hyperoxia caused increased expression of Notch–2, Notch–3, and other downstream effectors in the Notch pathway. Treatment of FLF organoids with a gamma-secretase inhibitor of Notch prior to exposure to hypoxia-hyperoxia prevented the development of the BPD phenotype. Examination of autopsy specimens from infants who died from BPD showed evidence of Notch expression by pulmonary fibroblasts.

Conclusions The fibroblast proliferation and gene expression pattern seen in the 3D model are similar to the histopathology of the fibrotic component of BPD in human infants. Increased expression of Notch was found in our model as well as in autopsy specimens from infants who died from BPD and inhibition of Notch obviated the development of the BPD phenotype, suggesting that the pathophysiology of BPD may result from a Notch-mediated mechanism in response to hypoxia-hyperoxia. With further validation of the model we hope to broaden our understanding of BPD and use this model to identify novel therapies.

104 NASAL HIGH-FREQUENCY OSCILLATION PROVIDES ACCEPTABLE RESPIRATORY SUPPORT FOR PREMATURE LAMBS

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Purpose of Study Nasal continuous positive airway pressure (NCPAP) is a popular method of non-invasive respiratory support in neonates. NCPAP has been shown to improve lung volume and tidal volume, and to decrease work of breathing in neonates following extubation.

Abstract 104 Table 1

Mode	M:F	Gestationalage atdelivery (d)	DeliveryWt (Kg)	PaO_2 (mmHg)	F_{1O2}	$PaCO2^{(mmHg)}$	$PIP_2^{\Theta)(cmH}$	pH
NHFO	4:0	129±1	2.6±0.4					
DOL6				97±37	0.32±0.06	57±10	22±1	7.41±0.05
NPFV[b]	3:2	132±1	4.7±0.3					
DOL6				75±12	0.30±0.04	52±4	18±3	7.33±0.06

[a]PIP=peak inspiratory pressure at the ventilators; [b] From Null D, Pediatr Res 2014.

Recently published retrospective data by another group showed that the Dräger Babylog VN500 could be non-invasively applied in the high-frequency (HF) mode to support premature infants with early BPD (Mukerji A *et al*, *Am J Perinatol* 2015). We tested whether this ventilator and mode will support chronically ventilated premature lambs.
Methods Used Five premature lambs were supported by nasal high-frequency oscillation (NHFO; Dräger Babylog VN500 ventilator in the HF mode). Comparison was to historical premature lambs supported by nasal pulsatile Flow Ventilation® (NPFV; Percussionaire VDR4 ventilator). Ventilation support was for 3d. PEEP was 7–8 cmH_2O for both groups.
Summary of Results Acceptable arterial blood gases and pH were sustained by both ventilation modes (Table 1).
Conclusions These results demonstrate successful non-invasive respiratory support using two high frequency ventilator devices and approaches. HL110002.

105 CHRONIC AND ACUTE HYPOXIA MARKEDLY ALTER CA2+ SIGNALING IN ADULT AND FETAL PULMONARY ARTERIAL MYOCYTES

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Purpose of Study Ca2+ signaling is well regarded as being vital to hypoxic induced pulmonary arterial (PA) vasoconstriction and chronic high altitude living can exacerbate this process. We performed this study to better understand the Ca2+ signals and to test the hypothesis that chronic hypoxia will increase Ca2+ wave activity due to acute hypoxia in pulmonary arterial myocytes (PAM) of both fetal and adult sheep.
Methods Used We exposed pregnant and non-pregnant ewes to 3800m for >110 days to inducechronic hypoxia. We then performed confocal imaging of PAM in Fluo-4 loaded intact arteries. Images were recorded in an atmospheric chamber at ~37°C adjusted to either normoxic conditions, at ~300m, or acute hypoxic conditions, simulated by exposing PAs to ~4% O2 for 30 min. Ca2+ signal characteristics in regions of interest (ROIs) were examined with automated analysis procedures.
Summary of Results Chronic hypoxia increased Ca2+ wave size in adults, rate of cytosolic Ca2+ removal in fetuses, and ROI recruitment in adults, albeit most ROIs occur in the same cell. Acute hypoxia decreased Ca2+ wave size in chronically hypoxic adults and decreased ROI recruitment in normoxic but not chronically hypoxic adults. It also reduced Ca2+ wave size in normoxic fetuses and obliterated Ca2+ signaling in chronically hypoxic fetuses. Maturation increased Ca2+ wave size as well as recruited more ROIs across the artery wall.
Conclusions The results gathered indicate that chronic hypoxia modifies the influence of acutehypoxia on Ca2+ signaling in fetal and adult PAM in marked ways that may be important to pulmonary vascular dysfunction in those who live and are born at high altitude. (NIH and NSF supported).

106 DECREASE IN INTUBATION RATES AFTER EARLY POSITIVE PRESSURE VENTILATION USING A MODIFIED NASAL CANNULA DURING NEONATAL RESUSCITATION OF LARGER PRETERM AND TERM INFANTS

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10.1136/jim-d-15-00013.106

Purpose of Study We evaluated the safety and efficacy of modified nasal cannula (NC) for providing positive pressure ventilation (PPV) and/or CPAP in larger preterm as well as term infants in comparison to PPV provided by a face mask prior to the introduction of NC at our institution. PPV was delivered via T-piece connected to either NC or face mask.
Methods Used Data on all infants with birth weight of ≥1500 g requiring PPV and/or CPAP in the delivery room (DR) was prospectively collected in our neonatal intensive care unit database from 01/2009 to 09/2014. Institutional review board approval was obtained for reviewing the data. Data obtained for infants who received PPV via face mask prior to introduction of NC was compared with data from infants who received PPV and/or CPAP with NC. The primary outcome was need for endotracheal intubation. Other outcomes included need for chest compressions in the DR, air leaks on first radiograph, intubation rates at 24 hours of age, and death. Data was analyzed using IBM SPSS software version 22.
Summary of Results Out of 763 newborns who received PPV and/or CPAP in the DR, 376 were resuscitated using face mask compared with 387 who received NC. Mean birth weights and gestational ages were 2898 g and 36.6 weeks for the face mask group, and 2770 g and 36.2 weeks for the NC group. Intubation rates decreased significantly from 30.3% to 18.3% ($P<0.001$) after use of NC in the DR. At 24 hours of age, 16.2% of infants remained intubated in the face mask group vs. 8.3% of infants in the NC group ($P=0.001$). Eight infants in the face mask group received chest compressions compared to 5 infants in the NC group. Air leak rates were similar in both groups (4.3% and 3.9% in face mask and NC group, respectively). Four infants in the face mask group expired compared to 1 infant in the NC group.
Conclusions Resuscitation using NC in the DR decreased intubation rates in larger preterm and term infants. Fewer infants remained intubated at 24 hours with the introduction of NC in the DR. Prospective studies comparing NC vs. face mask use for infants requiring PPV in the DR are needed.

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Concurrent Session
3:30 PM
Thursday, January 28, 2016

107 LIMB PROPRIOCEPTIVE STIMULATION DECREASES INTERMITTENT HYPOXIA AND BRADYCARDIA IN PREMATURE NEONATES

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10.1136/jim-d-15-00013.107

Purpose of Study Apnea of Prematurity (AOP) is common, affecting the majority of infants born <34 weeks gestational age (GA). Apnea is accompanied by intermittent hypoxia (IH), which contributes to multiple pathologies, including retinopathy of prematurity (ROP), sympathetic ganglia injury, impaired pancreatic islet cell and bone development, and neurodevelopmental disabilities. Standard of care for AOP/IH includes prone positioning, positive pressure ventilation, and caffeine therapy, none of which is optimal. The objective is to support breathing in premature infants by using a simple, non-invasive vibratory device placed over limb proprioceptor fibers, an intervention using the principle that limb movements facilitate breathing.

Methods Used Premature infants (23–34 wks GA) with clinical evidence of AOP/IH were enrolled 1 week after birth. Caffeine therapy was not a reason for exclusion. Small vibration devices were placed on one hand and one foot and activated in a 6 hour ON/OFF sequence for a total of 24 hours. Heart rate, respiratory rate, oxygen saturation (SpO2), and breathing pauses were continuously collected.

Summary of Results 1. Fewer breathing pauses occurred during vibration periods, relative to baseline, Figure 1A.

2. Significantly fewer SpO_2 declines occurred with vibration ($p<0.05$), relative to control periods. Figure 1B.

3. Significantly fewer bradycardic events occurred during vibration periods, relative to no vibration periods ($p<0.05$), Figure 1C.

Conclusions Proprioceptive stimulation, simulating limb movement, reduces breathing pauses and IH episodes, and, lowers the number of bradycardic events that accompany aberrant breathing episodes. This low-cost non-invasive intervention may lower rates of ROP and improve neurodevelopmental outcomes.

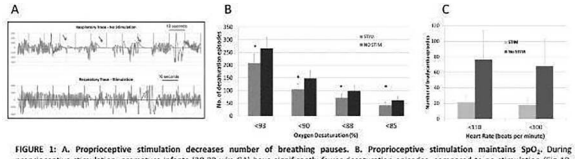

FIGURE 1: A. Proprioceptive stimulation decreases number of breathing pauses. B. Proprioceptive stimulation maintains SpO_2. During proprioceptive stimulation, premature infants (28-32 wks GA) have significantly fewer desaturation episodes, compared to no stimulation (Fig 1B, $p<0.05$, Student t-test, n=15). C. Fewer bradycardic events during proprioceptive stimulation. Bradycardia episodes were significantly reduced during the stimulation period compared to no stimulation periods ($p<0.05$, Student t-test, n=10).

Abstract 107 Figure 1

108 *IN VIVO* INDUCTION OF HEME OXYGENASE-1 BY ASPIRIN

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10.1136/jim-d-15-00013.108

Purpose of Study Heme oxygenase (HO), the rate-limiting step in the heme catabolism, has antioxidant, anti-inflammatory, and cytoprotective properties. These pleiotropic effects may play a key role in the maintenance of a healthy pregnancy and placental development. Studies have shown that inhibition or deficiencies of HO-1 may result in pregnancy disorders (e.g. intrauterine growth restriction, pre-eclampsia, or recurrent miscarriages). Consequently, the ability to pharmacologically upregulate HO-1 expression could be used to prevent pregnancy complications. Because aspirin can increase HO-1 expression *in vitro*, we examined if aspirin can induce HO-1 expression *in vivo* using a mouse model.

Methods Used At t=0, baseline HO-1 promoter activity in adult female HO-1-*luc* mice (6–8 wks old) with a transgene containing the full-length HO-1 promoter driving expression of the reporter gene luciferase (*luc*) was assessed by *in vivo* bioluminescence imaging. Mice were given aspirin IP (170 μmol/kg/d or 0.75 mg/d) for 2 wks. Mice were imaged weekly and then sacrificed. Blood was immediately collected for plasma liver enzyme levels to assess liver toxicity. HO activity and HO-1 protein levels in the liver and spleen were measured. Data were expressed as fold change from age-matched control levels. Differences were deemed significant at $p<0.05$.

Summary of Results Daily aspirin treatment resulted in a 2.3-fold increase in HO-1 promoter activity in the liver after 2 wks. No increase was seen in the spleen. 1- and 2-wks post-treatment, HO activity significantly increased in the liver and spleen (1.2- and 1.4-; 1.3- and 1.3-fold, respectively) (see Table 1). In addition, HO-1 protein increased only in the spleen (1.2 and 1.4-fold) at 1- and 2-wks post-treatment, respectively. Liver enzymes were not elevated.

Conclusions In summary, daily treatment with aspirin is safe and can induce HO-1 expression *in vivo* in the liver and spleen. We conclude that aspirin may have potential use for the treatment of pregnancy complications due to an under-expression of HO-1.

Abstract 108 Table 1 Fold Change in HO Activity Over Controls. (*p<0.05 vs Controls)

	Control	Aspirin×1 Wk	Aspirin×2 Wk
Liver	1.0±0.0 (n=6)	1.2±0.1* (n=6)	1.4±0.2* (n=4)
Spleen	1.0±0.2 (n=6)	1.3±0.1* (n=6)	1.3±0.1* (n=4)

109 LIMITING FEEDING DECREASES ALVEOLAR FORMATION IN THE LUNG OF PREMATURE LAMBS SUPPORTED BY NON-INVASIVE VENTILATION

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Purpose of Study Prolonged invasive mechanical ventilation (IMV) disrupts alveolar formation. Inadequate nutrition related to postnatal feeding intolerance may contribute to that outcome. Postnatal sedation is necessary during IMV to reduce discomfort and distress related to the endotracheal tube. Sedation also may disrupt alveolar formation. Isolating the contribution of inadequate postnatal nutrition from that of postnatal sedation on alveolar formation in chronically ventilated premature neonates is difficult. Our premature lamb model provides opportunity to separate the contributions, using non-invasive ventilation (NIV) because preterm lambs that are supported by NIV for 3d or 21d feed and grow appropriately, require minimal sedation and have appropriate alveolar formation and gas exchange. Our goal was to quantify the impact of restricted nutrition (RN) versus excess sedation (ES) on alveolar formation.

Methods Used Three groups of chronically ventilated premature lambs were supported by NIV (n=4/group) for 21d. Group 1 (RN) was limited to the amount of ewe's colostrum/milk (e.g., last wk of life, 78±15 mL/Kg/d of life) tolerated by premature lambs supported by MV for 21d. Group 2 (ES) was given the amount of sedation (6±4 mg/Kg/d) necessary for premature lambs supported by IMV for 21d. Group 3 (control NIV) tolerated enteral feeding and grew, with low amount of sedation (<1 mg/Kg/d). We quantified alveolar formation.

Summary of Results At 21d, the RN group received less milk daily (24±3%; mean±SD; $p<0.05$) than the control group (last wk of life, 242±29 mL/Kg/d). The RN group had significantly lower radial alveolar count (3.9±0.1), secondary septal volume density (0.03±0.01), and thicker distal airspace walls (4.0±0.2) than the control NIV group (5.9±0.3; 0.06±0.01; 3.1±0.3, respectively) and ES group (5.0±0.6; 0.05±0.01; 3.0±0.4, respectively). No differences in lung morphometry were detected between the control NIV and ES groups.

Conclusions RN, but not ES, impairs alveolar formation in premature lambs. A mechanism for impairment may be less apoptosis of mesenchymal cells in the walls of the distal airspaces in the RN group, based on related analyses. HL110002, HL062875.

110 SURGERY DURING PHASE II RETINOPATHY OF PREMATURITY (ROP) LEADS TO MORE LASER INTERVENTION

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Purpose of Study ROP is a proliferative neovascular disorder in preterm infants. ROP occurs in two phases: phase I - vaso-obliteration and phase II - oxygen sensitive neovascularization starting at approximately 32 weeks post menstrual age (PMA). Risk factors for ROP include gestational age, birthweight, and severity of illness. It is unknown if surgery and anesthesia are associated with increased rate of intervention for ROP. We hypothesized that infants at risk for ROP have a higher incidence of laser treatment if they had surgical exposure.

Methods Used We performed a retrospective chart review of infants born during from January 2013 to December 2014 with gestational age ≤27 weeks and birthweight ≤800g. Infants had serial ophthalmologic ROP exams and at least one surgical procedure. Infants were excluded if the surgery occurred after retinal maturation or laser intervention. Demographic data was collected and intra-operative anesthesia records were reviewed. Infants were also assigned a score based on their pre-operative respiratory support, with a higher score relating to more invasive support and higher Fi02.

Summary of Results Seventy-six infants met gestational age and weight criteria. Forty-nine infants had a surgical procedure of which 11 infants (22%) progressed to require laser intervention. Only 1 infant who did not have a surgical procedure (5%) had laser intervention (p 0.01). There was no difference in gestational age, birthweight, duration of surgery or respiratory score between infants receiving laser treatment and infants who had spontaneous regression. All infants had an average SpO2>97% during surgery. Infants who progressed to require laser treatment for ROP had their surgical procedures at a younger age [median 31.5w (IR 29.5–39.4w)] compared to those whose ROP regressed [median 38.1w (IR 31.3–41.4w) [p 0.01].

Conclusions In this cohort of high risk infants we found early operative exposure further increases the need for laser treatment for severe ROP. Patients who underwent surgery at ~32 weeks PMA, a time thought to correlate with transition to phase II ROP with increased oxygen sensitive growth factors, were more likely to require laser intervention. We speculate that vascular growth factors may be further up-regulated in high risk preterm infants undergoing an operative procedure during phase II neovascularization.

111 CORRELATION OF MRI BRAIN FINDINGS WITH SEVERITY OF NEURAL TUBE DEFECT IN PATIENTS WITH SPINA BIFIDA

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10.1136/jim-d-15-00013.111

Purpose of Study To analyze the spectrum of intracranial MRI findings in infants with spina bifida and determine if there is any correlation between the size and type of spinal defect and the severity of intracranial findings associated with the Chiari type II malformation.

Methods Used Brain and spine MRIs of 35 patients between birth and 18 months (mean age=91 days) with spina bifida were analyzed. Spinal defects were characterized and measured, including the defect height and dimensions of the meningocele neck and sac, if present. Midline sagittal images were used to measure the diameter of the

foramen magnum, cerebellar tonsillar herniation (if any), cerebellar height and width, and cross-sectional area of the posterior fossa. The presence of tectal beaking, medullary kinking, and abnormalities of the corpus callosum were determined qualitatively. When possible, measurements were normalized for age by dividing by average measurements taken from MRIs of normal patients of similar age (n=71).

Summary of Results Of 35 patients, 18 had their meningocele surgically resected at the time of the MRI study. Most patients (n=29) had at least two of five quantitative intracranial measurements (mean=3) that differed significantly from age-adjusted averages, and 20 had at least two of three qualitative abnormalities (mean=1.7). Most defects (n=32) were in the lumbosacral region, however patients with cervical or thoracic defects showed fewer intracranial abnormalities. There was a small but significant correlation (Spearman Rank=0.36, P<0.05) between spinal defect height and amount of tonsillar herniation. Much less severe intracranial abnormalities were noted in patients with lipomyelomeningocele compared to those with myelomeningocele or resection.

Conclusions Newborn patients with spina bifida tend to present with multiple abnormal brain findings. The most severe variations occur with open defects. Those with closed defects (lipomyelomeningocele) and with thoracic or cervical defects appear less likely to develop associated brain malformations. Given the known association of Chiari II malformation with open spinal dysraphism, the correlation between spinal defect height and tonsillar herniation (a hallmark of Chiari malformation) and the seeming influence of defect level on the severity of associated findings merit further exploration.

112 LOWER BONE MINERALIZATION IN PRETERM INFANTS WITH NEPHROCALCINOSIS

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Purpose of Study Nephrocalcinosis (NC) is the calcification of renal tissue, and is found in 7% to 64% of preterm infants with gestational age (GA) <32 weeks or <1500g. NC is caused by increased calcium in the urine leading to precipitation of calcium oxalate and/or calcium phosphate crystals which adhere to the renal tubular epithelium. NC has been associated with bone mineral deficiency. However, the relationship between urinary calcium loss and the effect on bone mineral density in preterm infants remains unknown. Bone mineralization in preterm infants has been assessed by dual energy X-ray absorptiometry (DXA, bone mass and density) and speed of sound quantitative ultrasound (SOS, bone elasticity and strength) with 99% accuracy (Chan 1992, Nemet 2001). The objective of this study is to evaluate bone mineralization in preterm infants with NC.

Methods Used This is a prospective observational cohort study including infants with GA ≤32 weeks or birth weight ≤1800g. Infants are evaluated for the presence of NC by renal ultrasound (US) and only those diagnosed with NC were included in the analysis. Bone mineral density is then assessed using total body DXA scan (Hologic) and tibial bone US (Omnisense 8000) at the time of discharge.

Summary of Results 7 infants have completed the study with 5 showing evidence of NC on renal US. The 5 NC infants' GA ranged from 26–28 weeks. Average birth weight was 940±127g. Corrected GA at the time of the imaging studies ranged from 36–39 weeks. DXA scan demonstrated a total body mineral content (BMC) of 25.6 ±7.1g and bone mineral density (BMD) of 0.11±0.02 g/cm^2. A published study demonstrated an average BMC of 31.8±6.1g and an average BMD of 0.13±0.02 g/cm^2 in preterm infants at 40 weeks corrected post conceptual age (Quintal 2014). Average SOS using tibial bone US was 2731.8±123 m/s with a percentile of 2.4±4 and a Z score of –2.72±1.08, p <0.05. Normal term newborn range of SOS is 2899–3314 m/s (Nemet 2001).

Conclusions Our preliminary data on a small sample population demonstrated decreased bone mineralization in preterm infants with NC by both DXA scan and tibial bone US. We speculate that the hypercalciuria in preterm infants with NC originates from the infant's bones resulting in diminished bone mass and quality.

113 PREOPERATIVE AEEG ABNORMALITIES IN TERM NEONATES WITH COMPLEX CONGENITAL HEART DISEASE

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10.1136/jim-d-15-00013.113

Purpose of Study Our objective was to describe preoperative aEEG abnormalities in term neonates with complex congenital heart disease (CHD).

Methods Used All neonates > 37 weeks admitted to Loma Linda University Children's Hospital neuroNICU from April 2014-August 2015 with an aEEG performed at<5 days of age were included. aEEG was performed for 24 hours with review by a pediatric neurologist blinded to clinical data. Abnormal aEEG was defined by a predominant background: discontinuous normal voltage, burst suppression, abnormal sleep-wake cycle in the absence of sedating medications or seizures. Variables included demographics, CHD lesion and category, blood gas labs and mortality. Demographics were summarized using mean, median or frequency as appropriate.

Summary of Results A total of 43 neonates had a mean gestational age of 38.8±1.0 weeks and mean birth weight 3192±590 g, 24/43 (56%) were male and 23/43 (53%) were prenatally diagnosed. Only a few neonates 4/43 (9%) were microcephalic. Complex CHD included single and two ventricle lesions. The majority of neonates 21/43 (49%) had two ventricles without arch obstruction or single ventricle with arch obstruction 12/43 (28%), a smaller percentage had single ventricle without arch obstruction 6/43 (14%) or two ventricles with arch obstruction 4/43 (9%). Most patients were hemodynamically stable with a median pH 7.32 (7.11–7.43) and lactate

2.6 (1.1–17) with an in-hospital mortality of 5/43 (12%). The majority of aEEGs 39/43 (91%) were performed at ≤ 72 hours of age. A total of 14/43 (32%) had abnormal findings with the majority described as abnormal sleep-wake cycle 11/14 (78%). A single patient was found to have electrographic seizures.

Conclusions While the majority of neonates in a mixed group of complex CHD lesions had normal preoperative aEEGs, one-third had abnormal aEEGs with abnormal sleep-wake cycle being the most common finding. Abnormal sleep-wake cycles on aEEG may provide screening for delayed brain maturation that is known to increase the risk for white matter injury in neonates with complex CHD.

114 CUMULATIVE INTRAVENOUS MACRONUTRIENT DOSE AND PARENTERAL NUTRITION ASSOCIATED CHOLESTASIS IN PRETERM NEONATES AND NEONATES WITH GASTROINTESTINAL DISORDERS

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10.1136/jim-d-15-00013.114

Purpose of Study Parenteral nutrition (PN) associated cholestasis (PNAC) can progress to liver failure. While the etiology of PNAC is multi-factorial, it has been associated with PN macronutrient doses. This study's objective is to determine if glucose, amino acid (AA), and lipid dose is associated with PNAC in two high-risk populations.

Methods Used This is a retrospective case-control study. Inclusion criteria: gestational age (GA) ≤ 29 weeks or gastrointestinal diagnosis (GD) and survival > 14 d. Cases (subjects with PNAC, direct bilirubin ≥ 2mg/dL) were matched to controls (CON) by birth year and GA or GD. Daily macronutrient intake was compared between cases and controls using autoregressive regression models, and cumulative intake at 28 days was compared using Student's t-test. Risk factors for PNAC were determined using odds ratios.

Summary of Results For the preterm cohort (13=cases, 26=CON), when compared to CON, cases had a longer mean (±SD) PN duration (56±23 vs. 28±12 d, p<0.01) and a higher glucose (p=0.03), lipid (p<0.01), and total caloric intake (p<0.01) over time. However, only cumulative AA dose was higher in cases vs. CON. The OR for PNAC when PN days exceeded 35 was 5.3 (p=0.02). For GD neonates (14=cases, 14=CON), when compared to CON, cases had a delay in enteral nutrition initiation (25 ±13 vs. 14±7 d, p=0.02) and a higher cumulative lipid dose and PN calories. The OR for PNAC when IL dose and PN intake exceeded 28 g/kg/d and 1094 kcal/kg/d at 2 weeks, respectively, was 6.3 (p=0.03 for both).

Conclusions In this study, lipid dose and total caloric intake was associated with PNAC in preterm and GD infants.

Abstract 114 Table

	Preterm Cohort		GD Cohort	
	Cases	Controls	Cases	Controls
Cumulative AA (g/kg/d)	85±17*	70±24*	78±21	62±28
Cumulative GDR (mg/kg/min)	258±69	212±77	285±74	229±99
Cumulative IL (g/kg/d)	60±16	49±21	58±20*	32±17*
Cumulative PN (kcal/kg/d)	2199 ±519	1812 ±656	2286 ±565*	1693 ±668*
Maximum Direct Bilirubin (mg/dL)	8±6*	1±0*	5±3*	1±1*
Days of age at PNAC	37±19	–	22±12	–

Mean±SD. Amino acid (AA), glucose delivery rate (GDR), lipid (IL), parenteral nutrition (PN), *p<0.05.

115 MORTALITY AND MORBIDITIES ASSOCIATED WITH PERSISTENT PATENT DUCTUS ARTERIOSUS IN EXTREMELY LOW BIRTH WEIGHT INFANTS

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10.1136/jim-d-15-00013.115

Purpose of Study Spontaneous closure of the patent ductus arteriosus (PDA) has been reported in 30% of ELBW infants. Persistence of the PDA is associated with higher mortality and morbidity, specifically bronchopulmonary dysplasia (BPD), intraventricular hemorrhage (IVH), and necrotizing enterocolitis (NEC).The objective of this study is to examine the morbidity and mortality in ELBW infants with and without a persistent PDA.

Methods Used Retrospective review of electronic medical records of all ELBW infants admitted to the NICU from 2002 to 2013 at LAC+USC Medical Center.Serial echocardiograms were performed on all infants within the first 48 hours of life. Infants who had spontaneous closure or trivial PDA were classified as Group 1 and those infants with persistent PDA (HsPDA requiring medical or surgical treatment) were classified as Group 2.

Abstract 115 Table 1

	Group 1: Spontaneous Closure N=64	Group 2: Medical or Surgical Intervention N=101	P Value
Birthweight (grams)	722±169	709±163	NS
Gestational Age (weeks)	26±2	25±2	0.004
Surfactant	83%	94%	0.021
Spontaneous Bowel Perforation	11%	15%	NS
BPD	42%	38%	NS
Grade 3–4 IVH	1.5%	12%	0.017
Stage 3 ROP and higher	20%	28%	NS
Vasopressor Resistant Hypotension	42%	68%	0.0001
Death	12.5%	19%	NS

Summary of Results The study included 165 patients, 64 (39%) infants in Group 1 and 101 (61%) infants in Group 2.The use of surfactant, rate of Grade 3–4 IVH and pressor resistant hypotension were statistically significantly different between Groups 1 and 2.There was no difference in mortality, rate of bowel perforation, BPD and Stage 3 or higher retinopathy of prematurity (ROP) between the two groups.

Conclusions In spite of lower gestational age, ELBW infant with PDA who were aggressively treated with medical and surgical intervention had comparable rate of BPD, ROP, bowel perforation and mortality with those who had spontaneous closure of PDA.The incidence of pressor resistant hypotension and Grade 3–4 IVH was higher in ELBW infants with persistent PDA.

116 ANTENATAL FACTORS ASSOCIATED WITH COMBINED CEREBELLAR AND INTRAVENTRICULAR HEMORRHAGE IN PRETERM NEONATES

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Purpose of Study The diagnosis of cerebellar hemorrhages (CBH) in preterm neonates has been increasing and its association with intraventricular hemorrhage (IVH) is poorly defined. The purpose of this study is to investigate the incidence of isolated CBH, combined IVH and CBH, and identify antenatal factors associated with both hemorrhages in preterm neonates.

Methods Used This is a retrospective cohort study on all babies ≤1250 grams born between 2009 and 2013 at LAC +USC Medical Center who developed CBH and or IVH, diagnosed by cranial ultrasound (CUS) and MRI. Maternal and neonatal demographics, clinical data and imaging reports were abstracted from electronic and paper medical records. Imaging was reviewed for grading of CBH.

Summary of Results There were 248 infants born during this study period. A total of 49 (19.7%) infants were found to have CBH; 35 (71%) had concomitant IVH and 14 (29%) had isolated CBH. There was no statistically significant difference in BW, mode of delivery, use of antenatal steroids and maternal chorioamnionitis between the two groups. Infants with CBH alone were more mature, born to mothers with preeclampsia and were more often small for gestational age (SGA) (Table 1). There was a higher rate of combined CBH and IVH compared to isolated CBH alone (Table 2).

Abstract 116 Table 1 Maternal and Neonatal Demographics

	CBH N=14	IVH and CBH N=35	P value
BW (gm)	669±267	673±177	NS
GA (wk)	26.3±2	25±2	0.028
SGA	77%	20%	<0.0001
Antenatal Steroids	77%	94%	0.003
Cesarean Section	92%	74%	NS
Chorioamnionitis	23%	26%	NS
Preeclampsia	69%	21%	0.02

Abstract 116 Table 2 Incidence of IVH and CBH

	All CBH N=49	Mild CBH N=29	Mod-Sev CBH N=20
No IVH	14/49 (29%)	8/29 (28%)	6/20 (30%)
Grade I or II	30/49 (61%)	18/29 (62%)	12/20 (60%)
Grade III or IV	5/49 (10%)	3/29 (10%)	2/20 (10%)

Conclusions Majority of CBH in our study had concomitant IVH. Presence of maternal PIH, higher GA and SGA infants may be protective for the occurrence of combined IVH and CBH, but, not isolated CBH. Further studies are needed to verify this association.

Neuroscience I
Concurrent Session
3:30 PM
Thursday, January 28, 2016

117 5-HT$_6$ RECEPTORS IN THE INDIRECT BUT NOT DIRECT STRIATAL PATHWAY REGULATE COCAINE REINFORCEMENT

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10.1136/jim-d-15-00013.117

Purpose of Study Addiction is a widespread psychiatric condition that has a large impact on society and healthcare. The nucleus accumbens (NAc) of the ventral striatum is crucial to addiction. Serotonin (5-HT) neurons strongly innervate the NAc, and 5-HT$_6$ receptors are notably abundant in striatum, particularly neurons of the direct and indirect pathways which are the two main outputs from the NAc. The specific mechanisms underlying drug seeking within these pathways is not well understood, but the relative activity in these pathways likely plays a role in the progression of addiction. We hypothesized that 5-HT$_6$ receptors function in a pathway specific manner to influence cocaine self-administration by regulating the reinforcing properties of the drug.

Methods Used We injected viral vectors into the NAc of rats that selectively increased 5-HT$_6$ receptor or GFP expression in direct or indirect pathway neurons. The rats (n=7–12) then self-administered cocaine under fixed and progressive ratio operant reinforcement sessions. The number of cocaine infusions per session was taken as a measurement of reinforcement by and motivation for cocaine. We then analyzed the pattern of cocaine taking and local differences in brain concentration of cocaine. We used a conditioned place preference (CPP) test to analyze changes in sensitivity to the rewarding properties of cocaine.

Summary of Results Rats with increased 5-HT$_6$ receptor expression in direct pathway neurons showed no

differences when compared to GFP controls. Rats with increased receptor expression in indirect pathway neurons self-administered significantly less cocaine than control rats during fixed ratio sessions at medium (p=0.019) and low doses (p=0.028), but not progressive ratio sessions (p=0.66). These rats also demonstrated longer times to initial cocaine infusion (p=0.007), titrated around lower brain concentrations of cocaine (p=0.038) and spent more time in the cocaine-paired chamber during CPP testing (p=0.038).

Conclusions 5-HT_6 receptors in indirect but not direct pathway neurons increase the sensitivity to the rewarding properties of cocaine, particularly at low doses, while leaving motivation for the drug unaffected. Thus 5-HT_6 receptors are a potential target for the treatment of drug addiction.

118 MICROGLIA ACTIVATION AND PROLIFERATION IN ISCHEMIC PRECONDITIONING

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10.1136/jim-d-15-00013.118

Purpose of Study Ischemic Preconditioning (IPC) is a neuroprotective phenomenon in which a brief ischemic exposure increases resistance to a subsequent prolonged period of ischemia. Microglia (MG), the resident macrophages of the brain, are the primary mediators of neuroinflammation and thought to be implicated in IPC. Neuroinflammation plays a critical role in CNS injury including stroke. Information on the mechanistic function of MG in stroke is limited, and the role of MG in IPC is unknown. Previous research in the Weinstein Laboratory has demonstrated that IPC induces an increase in the number of MG and macrophages within the ipsilateral cortex at the 72-hour post-IPC time point. We are interested in determining if the IPC-induced increase in MG is due to MG proliferation.

Methods Used Four C57BL/6 mice 12 weeks of age were subjected to a unilateral middle cerebral artery (MCA) occlusion surgery for 15 minutes. 72-hours post-surgery, the mice were euthanized and fixed transcardially via perfusion with 4% paraformaldehyde solution. Coronal sections of the brain within the bounds of the MCA region were taken for immunofluorescent staining. Tissue was incubated with anti-Iba1 (MG cell marker) and anti-Ki67 (proliferation marker) antibodies conjugated to fluorochromes. Sections were imaged via fluorescent microscopy (63X water immersion objective) and quantified via optical dissector stereological assay.

Summary of Results We found a marked increase in Iba1 + cells, Ki67+ cells, and double-labeled cells in ipsilateral preconditioned cortex compared to contralateral cortex. 63% of Ki67+ cells in ipsilateral cortex were also Iba1+ whereas <1% of Ki67+ cells in contralateral cortex were also Iba1+. Furthermore, 41% of Iba1+ cells in IPC cortex are also Ki67+ whereas <1% of Iba1+ cells in contralateral cortex were also Ki67+.

Conclusions The results of these experiments provide evidence of an actively proliferating population of MG in IPC cortex and also help to categorize the population of proliferating cells and myeloid cells in IPC and contralateral cortex. This study answers a fundamental yet important question about the response of MG to an IPC stimulus and will serve as a starting point for future investigations into the functional mechanism of innate immune cell activation in IPC and stroke.

119 OPTOGENETIC STUDIES OF RESPIRATORY RHYTHM GENERATION IN TRANSGENIC MICE

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10.1136/jim-d-15-00013.119

Purpose of Study The brainstem pre-Bötzinger complex (pre-BötC) has long been identified as a core circuitry for respiratory rhythm generation in mammals. It is generally assumed that the pre-BötC excitatory (glutamatergic) neurons are the substrate for inspiratory rhythm generation but this has been difficult to demonstrate experimentally without techniques for cell population-specific manipulation of excitatory neuron activity. Our studies were conducted in an effort to determine the population-specific role of pre-BötC glutamatergic neurons in respiratory rhythm generation.

Methods Used We applied optogenetic approaches to determine the population-specific role of pre-BötC glutamatergic neurons in respiratory rhythm generation in neonatal mouse brainstem slices *in vitro* and in adult mouse perfused brainstem-spinal cord preparations *in situ*. We established triple-transgenic mouse models for population-specific photoinhibition of pre-BötC glutamatergic neurons by crossing Cre-driver mouse lines for glutamatergic neurons (based on the vesicular glutamate transporter 2, VGluT2 promoter) with Cre-dependent optogenetic strains (Archaerhodopsin-3, Arch for inhibition of targeted neurons).

Summary of Results Results demonstrated that strong bilateral optical inhibition of pre-BötC glutamatergic neuron populations (continuous orange laser, 593 nm, 10 mW) caused rapid and reversible cessation of inspiratory rhythm in both *in vitro* and *in situ* preparations, indicating that pre-BötC glutamatergic neurons are essential for rhythm generation. Step-wise inhibition of the pre-BötC glutamatergic neuron population caused slowing of the respiratory rhythm as a function of the applied laser light power (2–10 mW).

Conclusions The laser power-dependent optical inhibition of pre-BötC glutamatergic neurons suggests that respiratory rhythm generation is due to a voltage-dependent mechanism. Using optogenetics, we have now verified for the first time that this voltage-dependent behavior is a key feature of the respiratory rhythm generating glutamatergic neurons in the pre-BötC.

120 C-JUN N-TERMINAL KINASE SIGNALING IN CHRONIC EPILEPSY

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10.1136/jim-d-15-00013.120

Purpose of Study Approximately 1% of the people in the world suffer from epilepsy and 30% of patients are not helped by medication. Therefore, there remains a great need to discover novel targets for antiepileptic drug development. One such potential target is c-Jun N-terminal kinase (JNK), an enzymatic pathway that catalyzes phosphorylation of a number of protein targets. JNK is a well-known mediator of neuronal death after a number of different insults to the brain, such as hypoxia. Antagonists of JNK have been shown to exert a potent anticonvulsant effect when tested in a commonly-used animal model of epilepsy (pilocarpine induction). However, it is unknown whether JNK signaling is excessively activated in chronic epilepsy. Therefore, we sought to measure activation of JNK isoforms in an animal model of chronic epilepsy.

Methods Used Chronic epilepsy was induced in 6 week-old male Sprague Dawley rats by injection of pilocarpine (380 mg/kg), which led to a period of convulsive seizures known as status epilepticus (SE). SE was allowed to continue for one hour, and then was terminated with sedative drugs. Animals typically recovered and then developed spontaneous convulsive seizures. JNK activity was assayed in hippocampal tissue from epileptic animals sacrificed 6 weeks post-SE and compared to age-matched controls. The tissue was homogenized and subjected to gel electrophoresis, and total JNK (tJNK) and phosphorylated form (pJNK) levels quantified using Western blotting techniques, and infrared imaging with a LiCor system. Each sample was also tested for a housekeeping protein to ensure accurate protein loading.

Summary of Results The results shown a significant increase ($n=10$; $p<0.05$) in the ratio of pJNK/tJNK for all isoforms of JNK (1.12 ± 0.05 for JNK2 and 1.18 ± 0.07 for JNK 1&3) when chronically epileptic animals were compared to age-matched naive specimens.

Conclusions JNK signaling was demonstrated to be elevated when measured in chronically epileptic animals, which suggests that activation of JNK may play a role in the maintenance of seizure activity, supporting its potential as a novel target for antiepileptic drug development.

121 VALIDATION OF THE USE OF A BEHAVIORAL PAIN ASSESSMENT TOOL WITH BRAIN-INJURED ICU PATIENTS

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Purpose of Study Patients with neurological injury exhibit pain-related behaviors different from those with other forms of critical illness. Therefore, behavioral pain scales validated for critically ill patients unable to self-report may inaccurately assess this population. A behavioral pain assessment tool (BPAT) was created based on these unique behaviors. The primary aim of this study was to validate the use of the BPAT for neurologically injured critically ill adults. This was achieved by assessing discriminant validation (comparing BPAT scores between nociceptive and non-nociceptive procedures), criterion validation (comparing BPAT scores with participant self-reports of pain), and inter-rater reliability.

Methods Used Critically ill brain-injured adults were simultaneously assessed with the BPAT before and during non-nociceptive (gentle touch) and nociceptive (turning) procedures by a similarly trained research assistant and nurse. When possible, self-reports of the presence (yes/no) and intensity of pain (0–10) were obtained and used as a comparative gold standard.

Summary of Results Fifty-six patients underwent observations. Median BPAT scores increased from 0 to 3 ($z=-7.3$, $p<0.01$) between non-nociceptive and nociceptive stimuli. Mann-Whitney U tests showed higher BPAT scores ($U=22.0$, $p<0.01$) for participants reporting pain during turning than those reporting no pain. Analyses using bivariate Spearman correlation coefficients showed strong positive correlation between BPAT scores and participants' self-reports of pain ($r=0.69$, $p=0.01$). Intraclass Correlation Coefficients (ICC=0.66–0.89, $p<0.01$) indicated moderate to high inter-rater agreement.

Conclusions Findings support discriminant validation, criterion validation, and inter-rater reliability. The BPAT appears to be a valid tool for detecting pain in non-communicative, neurologically injured patients in critical care settings.

122 ASSOCIATIONS BETWEEN SOMATOSENSORY EVOKED POTENTIALS AND CLINICAL DIAGNOSES IN MULTIPLE SCLEROSIS

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Purpose of Study Patients with Multiple Sclerosis (MS) can have the relapsing-remitting (RRMS), secondary-progressive (SPMS), primary-progressive (PPMS), or progressive-relapsing forms of MS. These MS types are often difficult to distinguish and are thought to involve different pathologies. Somatosensory Evoked Potentials (SEPs) can detect slowed conduction caused by demyelination in the nervous system. This may be helpful in understanding the physiologies of the different MS types. Our goal is to determine if there are associations between SEPs and the different clinical diagnoses of MS.

Methods Used Medical chart reviews were done on 110 patients with MS who had SEPs between 1997 and 2010 at the University of Washington MS Clinic. We recorded the MS subtype of each patient as designated by his or her provider. SEPs were performed bilaterally on median and tibial nerves during the study period. We obtained central conduction times (CC) and scalp amplitudes (SA) for each patient, collecting actual data values when available as well

as the clinician's interpretation of results as normal or abnormal. Abnormal CC refers to prolonged CC. Median and tibial nerve findings were analyzed separately. Associations between clinical diagnoses and SEPs were assessed using numerical and visual descriptive analysis and Fisher's Exact Tests to test association between the outcome (normal/abnormal) and MS types.

Summary of Results Tibial nerve SEPs showed some significant associations. When comparing CC, 62.5% of RRMS patients and 86.4% of the SPMS patients had abnormal CC while only 40% of the PPMS patients had abnormal CC ($p=0.011$). When analyzing the possible combinations of normal or abnormal CC and SA, 50% of PPMS patients had normal CC and abnormal SAs while 47.8% RRMS and 70% SPMS patients had abnormal CC with abnormal SAs ($p=0.092$). When comparing the values for CC and SA, RRMS and SPMS patients had more prolonged CC than did the PPMS patients.

Conclusions We found that there are associations between tibial SEPs and MS diagnoses, most notably the differences in central conduction between PPMS and SPMS. This shows that physiological differences may exist between these forms of MS, indicating possible differences in pathologies. Tibial SEPs thus might be useful in distinguishing between MS types and should be studied further for this purpose.

123 NEURAL RESPONSES DURING REFLEXIVE BLINKING ARE ABNORMAL IN BLEPHAROSPASM

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Purpose of Study Investigate the neural mechanisms of reflexive blinking in blepharospasm (BSP) patients compared to healthy controls (HC) using fMRI.

Methods Used 10 BSP patients (7F, 61.7±9.2) and 9 healthy controls (6F, 60.4±5.6) underwent an 8-minute fMRI scan during which air puffs were delivered to each participant's left eye in a pseudo-randomized fashion (40 per scan). Blink elicitation was confirmed using both simultaneous camera visualization and EMG monitoring. Data were analyzed using an event-related design, and groups were compared using a two-sample t test. Pearson correlation coefficients were used to test for relationships between clinical severity and changes in brain activity as measured by BOLD signal. Significance was defined as $p<0.05$, FWE corrected, for the group contrast and $p<0.05$ for the correlations.

Summary of Results BSP patients showed increased brain activity in their left premotor and inferior parietal cortex, and decreased activity within their left insula and right supramarginal gyrus and superior temporal lobe. Increasing activity in the left premotor cortex and right supramarginal gyrus were correlated with their Burke-Fahn-Marsden score ($r=0.74$, $p=0.01$; $r=0.70$, $p=0.002$) and Blepharospasm Disability Index ($r=0.63$, $p=0.05$; $r=0.63$, $p=0.05$).

Conclusions Preliminary results show that BSP is associated with abnormal brain responses during reflexive blinking. Activity in the supramarginal gyrus is decreased compared to controls, but increased with symptom severity suggesting overactivity in this region during reflexive blinking might serve as an early marker of disease. Enhanced response of the premotor cortex during reflexive blinking may stem from diminished inhibition within the sensorimotor network, and raises the possibility that inhibitory transcranial magnetic stimulation of the premotor cortex could potentially have therapeutic benefit in BSP. Further analysis of the brainstem will be conducted to test for abnormal function of the trigeminal system.

124 PROTEOLIPID PROTEIN LABELING OF EXTRACELLULAR VESICLES

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Purpose of Study Extracellular vesicles (EV's) are currently an intense area of focus for biomarker research involving various diseases like cancer and Parkinson's disease. EV's are small (100–1000 μm), protein and RNA containing vesicles that are released from cells into their surrounding media. Further understanding the composition of EV's advances the possibility of finding a biomarker for disease. This study characterizes the EV's that are released from oligodendrocytes by determining if proteolipid protein (PLP) can be labeled and identified on the EV's external surface using immunofluorescent labeling and nanoparticle tracking analysis (NTA). Oligodendrocytes are the targets for autoimmune response in MS, and examining an oligodendrocyte-specific protein like PLP is important for finding a biomarker for this disease.

Methods Used PLP wt and null mouse oligodendrocyte precursor cell (OPC) cultures were grown and matured for 0–48 hours before the culture media was removed for analysis. EV's were isolated from the media via differential ultracentrifugation. Primary PLP antibodies specific to the extracellular PLP domain were added to the PLP wt and null EV samples in a 1000 antibodies to 1 EV ratio. The samples were then diluted with DPBS 1× to 1mL and incubated overnight before being washed. R-Phycoerythrin conjugated secondary antibodies were then added and incubated for 1 hour before being washed. To determine the orientation of PLP in the EV membrane, a primary PLP antibody specific to the intracellular portion of the protein was used on additional wt and null samples. The Malvern Nanosight NS300 was used to determine the concentration and mean/mode sizes of the EV population for the PLP wt and null samples using a 532 nm laser for the fluorescent capture.

Summary of Results From two trials, the percentage of wt EV's labeled was 9% with the PLP external label and 1.4% with the PLP internal label. For the null EV's, these values were 0.74% and 1.96% respectively.

Conclusions The percentage of labeled EV's suggests that there is specific labeling of PLP with the PLP external antibody but not the internal antibody. This indicates that PLP in the EV's are oriented in the same manner as they are in the OPCs. In future trials, OPC cultures will mature for 5–7 days to amplify the PLP content.

125 EFFECTS OF HYDROGEN PEROXIDE AND PHENYLBUTYRATE ON MITOCHONDRIAL MEMBRANE POTENTIAL IN DOPAMINE NEURON

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Purpose of Study While phenylbutyrate has been shown to rescue neurons from oxidative stress by up-regulating the neuroprotective gene DJ-1, the exact mechanism of this protection is uncertain (Zhou *et al.*, 2011). Our recent metabolomics study indicated that phenylbutyrate may be acting to prevent damage to mitochondria, specifically protecting the inner mitochondrial membrane potential.

Methods Used In the present study, N27 dopaminergic neurons were incubated for 48 hr with phenylbutyrate 150 uM to which was added hydrogen peroxide 50 uM for an additional 24 hr. In order to measure the inner mitochondrial membrane potential and cell viability, cells were either stained using MitoTracker Red (CMXRos), a fluorescent mitochondrial stain, plus Hoechst, a fluorescent nucleic acid stain or JC-1, a separate fluorescent mitochondrial stain that shifts fluorescence when accumulated within mitochondria. To measure the inner mitochondrial membrane potential, the MitoTracker Red fluorescence was corrected using the Hoechst fluorescence measurements or the fluorescence shift of the JC-1 dye was analyzed.

Summary of Results In this study we found that cells exposed to H_2O_2 had decreased cell viability and hyperpolarized inner mitochondrial membrane potentials 24 hours after the initial exposure to H_2O_2. By contrast, cells that were pretreated with phenylbutyrate before being exposed to H_2O_2 maintained cell viability and inner mitochondrial membrane potential.

Conclusions We conclude that phenylbutyrate may protect dopamine neurons from hydrogen peroxide toxicity by reducing oxidative damage to mitochondria.

126 UNIQUE HYPEROXIA TOLERANT RATS ARE LESS ANXIOUS AND HAVE LARGER HIPPOCAMPI

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Purpose of Study Anxiety related to various factors and most notably the Post-Traumatic Stress Disorder (PTSD) is a significant medical problem that worsens during aging. For unknown reasons, only certain individuals develop anxiety and PTSD after trauma. Reduced hippocampal volume has been implicated as a possible contributor to anxiety and PTSD susceptibility but this relationship is unclear. By repeatedly breeding a single rat that unexpectedly survived breathing pure oxygen (hyperoxia), we serendipitously created a unique strain of Sprague-Dawley rats that survive indefinitely breathing hyperoxia ("tolerant rats") while control rats all die in ~66 hours. Because tolerant rats also develop less lung inflammation and oxidative stress after hyperoxia exposure, they provide an opportunity to learn about anxiety and hippocampal volume.

Methods Used Young (~3–5 months) and old (~12–15 months) control and tolerant rats were tested using behavioral tests including contextual fear conditioning, zero maze testing, and open field testing. Brain volumes were measured with MRI.

Summary of Results Young and old tolerant rats had less anxiety as evidenced by lower freezing times in contextual fear conditioning testing (e.g. freezing time/30s on 3rd day, $p<0.002$), longer times in open quadrants during zero maze open quadrant testing, longer distances moved in open field testing, and longer times spent in the center zone in open field testing compared to control rats. Young hyperoxia tolerant rats also had larger ($p=0.054$) hippocampal volumes (7.3+/–0.67% total brain volume) than young control rats (5.9+/–0.25% total brain volume).

Conclusions We created a novel rat strain tolerant rats that survive indefinitely in hyperoxia and also resist anxiety and have increased hippocampal volumes compared to control rats. The reduced inflammation and oxidative stress responses of tolerant rats may contribute to the increased hippocampal volumes and reduced anxiety of tolerant rats compared to control rats. Tolerant rats are a new model for investigating anxiety and PTSD.

Pulmonary and Critical Care I
Concurrent Session
3:30 PM
Thursday, January 28, 2016

127 CHANGES IN FRAILTY ARE ASSOCIATED WITH DISABILITY AFTER LUNG TRANSPLANT

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10.1136/jim-d-15-00013.127

Purpose of Study Lung transplant (LT) aims to improve survival and relieve disability. Little is known about what may predict disability in LT. Frailty is a construct from geriatrics also applicable to morbidity and mortality in solid organ transplant, including LT. Thus, we tested whether change in frailty predicts change in disability in LT.

Methods Used In this prospective cohort study,subjects who underwent LT between January 2012- June 2015 completed a survey and physical assessment that included measures of frailty before and 6 months after LT. Patient-reported disability was quantified using the Lung Transplant-Valued Life Activities (LT-VLA) scale (range 0–3; 0=none; 1=some; 2=a great deal; 3=unable to perform activities; established Minimally Clinically Important Difference [MCID] in mean LT-VLA=0.3]). Frailty was assessed by the Fried Frailty Phenotype (FFP, range 0–5, higher score denotes increased frailty) as well as the Short Performance Physical Battery (SPPB, range 0–12, lower score consistent with increased frailty). We tested the association between frailty and LT-VLA using sequential linear regression. In Model 1, we controlled for age, gender, and

respiratory diagnosis for LT. In Model 2, we also controlled for change in 6 minute walk distance (6MWD) and FEV1% predicted.

Summary of Results In 166 subjects, the mean age was 55 years and 54% were male. In Model 1, each 1-point improvement in SPPB was associated with an improvement of 0.11 in VLA (0.11; 95% CI=0.06, 0.17). Each 1-point improvement in FFP was associated with an improvement of 0.26 in LT-VLA (–0.26, 95% CI=–0.39, –0.13) 6 months post-transplant. In Model 2, each 1-point improvement in SPPB was associated with an adjusted improvement of 0.07 in LT-VLA (0.07; 95% CI=0.01, 0.13). Each 1-point improvement in FFP was associated with an adjusted improvement of 0.21 in LT-VLA (–0.21, 95% CI=–0.35, –0.08) 6 months post-transplant.

Conclusions Change in frailty is associated with a change in disability in LT patients independent of allograft function and other factors. Interventions to improve disability in LT should take frailty into account.

128 THE IMPACT OF LUNG TRANSPLANTATION ON QUALITY-ADJUSTED LIFE YEARS

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10.1136/jim-d-15-00013.128

Purpose of Study Lung transplantation (LT) aims to improve both the *quantity* and health-related *quality* of life (HRQL) for patients with advanced lung disease. Estimates of both survival and HRQL after LT are key to informed decision making. Thus, we aimed to assess the impact of LT on HRQL and quality-adjusted life years (QALYs).

Methods Used Breathe Again is an ongoing prospective longitudinal cohort study at UCSF, focused on impact of LT on HRQL. HRQL was quantified with the EuroQol 5D (EQ5D) utility instrument. The EQ5D responses can range from –0.11 to 1.0; higher scores denote better HRQL; a score<0 reflects a perceived health state worse than death. The EQ5D minimally clinically important difference (MCID) is 0.06. EQ5D was assessed prior to LT and at 3, 6, and 12 months after. Changes in EQ5D were analyzed using linear mixed models. Pre-LT QALYs were estimated using baseline EQ5D and post-LT QALYs were estimated by a time-weighted average of each subject's EQ5D from 3 months to 1 year post-LT for patients with EQ5D at every time point (Equation 1). Post-LT QALYs were compared to pre-LT QALYs to assess LT benefit.

Summary of Results Among 166 subjects who underwent LT between January 2010 and June 2015, mean pre-LT EQ5D was 0.62 (SD=0.23). Over the post-LT follow-up period, mean EQ5D averaged around 0.83 (SD 0.15–0.17). Overall, the improvement in EQ5D was 3 times the MCID and translated to an average gain of 0.2 QALYs per subject; however, 17% of subjects did not have an improvement. In 111 subjects with EQ5D at every time point, the total pre-LT QALYs were 69.2 and were 92.7 after LT - resulting in a net benefit of 2.3 QALYs per 10 subjects within the first year after LT.

Equation 1

$$QALY = \tfrac{1}{4}(EQ5D3mo) + \tfrac{1}{4}\left(\frac{EQ5D3mo+EQ5D6mo}{2}\right) + \tfrac{1}{2}\left(\frac{EQ5D6mo+EQ5D12mo}{2}\right)$$

Abstract 128 Figure 1

Conclusions LT affords patients with advanced lung disease an early and sustained improvement in HRQL. The majority of patients derive a QALY benefit from LT, but nearly one in 5 did not.

129 LUNG TRANSPLANTATION IMPROVES HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH ADVANCED LUNG DISEASE

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10.1136/jim-d-15-00013.129

Purpose of Study The overhaul of the policy for lung allocation in the U.S. in 2005 resulted in older and sicker patients undergoing lung transplantation (LT). The impact of LT on health-related quality of life (HQRL) has not been evaluated since this overhaul, limiting informed decision-making. We aimed to examine the impact of LT on HQRL in a contemporary population.

Methods Used Subjects at UCSF were administered a structured survey prior to and at 3, 6, and 12 months post-lung transplant. Generic HQRL was assessed using the Medical Outcomes Study Short Form 12 Physical Component Score (SF12PCS) (Range 0–100 with higher scores denoting better HQRL; standard deviation (SD) ±10; minimally clinically important difference [MCID] =4). Respiratory-specific HQRL was assessed with the Airway Questionnaire 20-revised (AQ20) (Range 0–20 with lower scores denoting better HQRL; MCID=½ SD=1.74). Data was analyzed using a linear mixed effects model and adjusted for pre-LT age, gender, diagnosis, and lung allocation score. To address survivorship bias, we assigned subjects who died (n=5) the worst possible score for time points following death.

Summary of Results In 149 LT recipients, the impact of LT on SF12PCS demonstrated an increase by 16 points at 3 months (4× MCID; 16.1; 95% CI=14.0–18.3) and an additional 5 point gain (5× MCID) at 6 (21.4; 95% CI=19.2, 23.5) and 12 months (20.1; 95% CI=17.9, 22.3). Generic HQRL increased up to 6 months post-LT then stabilized. Mean AQ20 decreased by 9 points in the direction of improvement (5× MCID; –8.8; 95% CI=–9.6, –8.0) within 3 months and stabilized at 6 (–9.1; 95% CI=–9.8, –8.3) and 12 months (–8.6; 95% CI=–9.4, –7.8). Airway-specific HQRL increased up to 3 months post-LT then stabilized.

Conclusions In a contemporary population of patients, LT had a large and sustained impact on generic and respiratory-specific HRQL. Also, improvements occurred at different time points after LT, suggesting the importance of extra-pulmonary vs. respiratory factors occurring at a different pace on overall well-being.

130 INVESTIGATING THE IMPACT OF LIVING ENVIRONMENT ON PAP ADHERENCE

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10.1136/jim-d-15-00013.130

Purpose of Study The gold standard for Sleep Apnea therapy is Positive Airway Pressure (PAP), but poor patient adherence can undermine its effectiveness. Studies have shown disparities in PAP adherence associated with socioeconomic status (SES) and neighborhood of residence, but these relationships were not well understood. The goal of this project was to investigate home environmental factors as potential barriers to PAP adherence that might explain these disparities.

Methods Used Adult sleep apnea patients at the Harborview Sleep Clinic who had been prescribed PAP were recruited at clinic visits to complete a short survey. The survey addressed living environment stability, bedroom partners, safety, comfort, and educational attainment. Medical records were abstracted for demographic data (including age, race/ethnicity, insurance status, and ZIP code), sleep apnea severity, comorbidities, and PAP use. Analysis was performed using multivariate linear and logistic regression.

Summary of Results The patients sampled (n=119) were diverse socioeconomically, with 41% non-White and 34% uninsured/Medicaid. After adjusting for race/ethnicity, insurance, neighborhood of residence, PAP satisfaction, comorbidities, and sleep apnea severity, we found that patients who changed where they slept at least once per month (18%, n=21) used their PAPs an average of 83 fewer minutes per night (p=0.037) and were 3.6× less likely (p=0.035) to meet CMS insurance adherence requirements. Living environment stability did not significantly differ by insurance status, race/ethnicity, or education. No other home environmental factors surveyed were found to be associated with PAP adherence. Of the SES markers, only education was significantly associated with PAP usage. In adjusted analyses, those with some college education or more (76%, n=89) used their PAPs an average of 89 more minutes per night (p=0.02).

Conclusions Stability of living environment may impact PAP adherence and sleep apnea treatment outcomes. This novel finding has potential implications for physician-patient dialogue, PAP device design, and advocacy for housing access. However, additional prospective investigation is needed to confirm this finding and inform the design of interventions to mitigate the effects of unstable living environment.

131 MUSCLE ATROPHY AND CLINICAL OUTCOMES IN CRITICALLY ILL PATIENTS

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10.1136/jim-d-15-00013.131

Purpose of Study Survivors of critical illness experience muscle weakness and physical impairment. Skeletal muscle atrophy, which reflects muscle loss, may be a surrogate for these outcomes. We aim to show that muscle fiber cross-sectional area (MFCSA) is associated with electrophysiologic (EP) and functional abnormalities in patients with acute respiratory distress syndrome (ARDS).

Methods Used This is a secondary analysis of a subgroup of patients (n=27) enrolled in a prospective cohort study of neuromuscular function in adult patients who met ARDS criteria for at least 3 days. EP assessments of neuromyopathy and percutaneous deltoid muscle biopsies were completed between days 10–14 after ARDS onset. Digital photomicrographs of H&E-stained biopsy slides were taken at 10× magnification and MFCSA was calculated for 100 fibers per subject by hand tracing fibers with imageJ software. Neuromyopathy was defined as compound muscle action potential amplitude in extensor digitorum brevis ≤ 1 mV with fibular nerve stimulation. Strength testing for ICU-acquired weakness (ICUAW) and assessment of ambulation were performed before hospital discharge. We performed descriptive statistics, unadjusted comparisons, and a single multivariable linear regression model.

Abstract 131 Table 1 MFCSA in μm^2 (mean±SD) in Study Patients

	Yes	No	p-value (Student's t-test)
Neuromyopathy	3456±878	4521±1144	<0.01
ICUAW	3217±948	4378±1088	0.02
Unable to walk at hospitaldischarge	3364±922	4235±1081	0.02

Summary of Results Subject mean age was 50, 74% were male, 19% required vasopressors during hospitalization, 58% had neuromyopathy (out of 26 measured), 25% had ICUAW (out of 20 measured), and 37% were unable to walk at hospital discharge. Mean MFCSA was 3913 ±1094 μm^2. As shown in the table, patients with neuromyopathy, ICUAW, and inability to walk at hospital discharge had significantly smaller MFCSA than those without these abnormalities. In multivariable linear regression analysis, lower MFCSA was associated with neuromyopathy independent of gender and use of vasopressors.

Conclusions In patients with ARDS, smaller MFCSA is associated with EP and functional abnormalities. Therapies to prevent muscle atrophy may decrease physical impairment after ARDS.

132 EFFECTS OF ULTRASOUND TRAINING DURING YEAR–2 OF MEDICAL SCHOOL ON YEAR–3 MEDICAL STUDENTS

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10.1136/jim-d-15-00013.132

Purpose of Study Medical students face many barriers to practicing point-of-care ultrasound (POCUS) during their Year–3 clerkships. We hypothesized that hands on

ultrasound training during Year–2 of medical school is an important factor in the preparation for using POCUS during Year–3.

Methods Used At our institution, ultrasound training is formally integrated into Year–1 medical school curriculum, but not Year–2 curriculum. The Ultrasound Interest Group (USIG) offers optional hands-on POCUS training events to medical students from Year–1 to Year–4. Each year USIG also hosts an Ultrafest, a hands-on POCUS symposium. During Year–3 orientation week, Year–3 volunteers took the 22-point Ultrasound-Objective Structured Clinical Examination (US-OSCE) that they previously took on completion of Year–1. It tested image acquisition and interpretation of the following systems: ocular, neck, pulmonary, cardiovascular, and abdomen. Following the US-OSCE, participants completed a survey utilizing a 5-point Likert scale to assess participants' comfort level with ultrasound.

Summary of Results Of 68 participants, 78% (53/68) did not attend any POCUS training events during Year–2 and 22% (15/68) did attend at least one training event. Comparing participants who did not attend versus participants who did, the mean US-OSCE score was 65.1% +/–20.0% versus 93.0% +/–10.2% ($p<0.01$). The mean completion time was 559 +/–81 seconds versus 422 +/–118 seconds ($p<0.01$). The survey showed 34.0% versus 93.3% ($p<0.01$) reported they were comfortable or very comfortable with the function of the ultrasound machine. 34.0% versus 93.3% ($p<0.01$) reported they were comfortable or very comfortable with basic ultrasound technique. 32.1% versus 80.0% ($p<0.01$) reported they were comfortable or very comfortable with basic ultrasound use and interpretation. 15.1% versus 73.3% ($p<0.01$) reported they were comfortable or very comfortable with ultrasound use on patients.

Conclusions This study supports the value of a longitudinal ultrasound curriculum. Attending POCUS training events during Year–2 is beneficial for students' retention of ultrasound knowledge they learned in their Year–1 of medical school. Continued Year–2 POCUS training increases Year–3 medical students' overall comfort level with ultrasound and increases preparedness for using POCUS in Year–3 clerkships.

133 EFFECTIVENESS OF ANIMATED SIMULATION FOR TEACHING ULTRASOUND TO MEDICAL STUDENTS

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10.1136/jim-d-15-00013.133

Purpose of Study Although the benefits of simulation training for resident physicians have been well established, its role in medical school ultrasound education is unclear. The goal of this study was to evaluate the effectiveness of teaching the Rapid Ultrasound for Shock and Hypotension (RUSH) protocol to medical students using combined didactics and animated simulation.

Methods Used Enrolled subjects were medical students who voluntarily participated in the RUSH Simulation Module in an ultrasound symposium. This study is a self-controlled prospective observational cohort study, in which subjects' confidence in utilizing ultrasound for diagnosing shock was assessed before and after the training (comparisons analyzed with the Mann-Whitney U test). Student satisfaction and perceived training effectiveness were also evaluated. The module included a didactic session taught by an ultrasonography certified physician, followed by an animated simulation case facilitated by medical students trained in RUSH. Sono-Sim Live simulators were used to demonstrate ultrasound findings consistent with the scenario. Manikin vital signs and physical findings were adjusted in real time based upon participants treatment decisions.

Summary of Results Of the participants, 25 completed both preliminary and post-surveys. Responses represent students from 6 different institutions consisting of both MD and DO programs, 88% and 12% respectively. Students were 'very satisfied' (median 9/10), and 56% 'strongly agree' that combining didactics and simulation was effective for teaching RUSH. In the preliminary survey, participants were 'not at all confident' in using ultrasound to diagnose shock, but the post-survey showed they had become 'confident' following the course ($p<0.05$). 95.8% of participants agreed or strongly agreed that this course enhanced their knowledge of pathophysiology.

Conclusions As evidenced by subjects' satisfaction, improved confidence, and overall impression of the course's effectiveness, we conclude that integrating a combined didactic and animated simulation style lectures into medical student ultrasound curriculum can be effective. Further studies are required in order to quantify the value of supplementing didactics with simulation when compared to didactics alone.

134 EFFECTS OF STUDENT-PERFORMED POINT-OF-CARE ULTRASOUND ON PHYSICIAN DIAGNOSIS AND MANAGEMENT IN THE EMERGENCY DEPARTMENT

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10.1136/jim-d-15-00013.134

Purpose of Study Despite the increasing integration of ultrasound training into medical education, there is an inadequate body of research demonstrating the benefits and practicality of medical student-performed point-of-care ultrasound (SP-POCUS). The primary purpose of this study is to evaluate the effects that SP-POCUS can have on physician diagnosis and management of patients in the emergency department (ED) with a secondary purpose of evaluating SP-POCUS diagnostic accuracy.

Methods Used SP-POCUS examinations were performed in the ED by five medical students who completed year-one of a medical school curriculum that integrated ultrasound training. Scan types included aorta, biliary, cardiac, IVC, eFAST, renal, lung, obstetrical, ocular, and soft tissue. Scans were evaluated by an emergency physician who then completed a survey to record any changes in diagnosis and management. If additional imaging studies were ordered, results were compared to assess accuracy.

Summary of Results A total of 641 scans were performed on the 482 patients enrolled in this study. For 12.4% of scans, SP-POCUS discovered a new diagnosis. For 17.3% of scans, SP-POCUS resulted in a change in management. SP-POCUS diagnosis agreed with 82.7% of the 301 additional imaging studies performed. Due to SP-POCUS, physicians avoided ordering an additional imaging study for 53.0% of the scans performed.
Conclusions This study showed that SP-POCUS is fairly accurate and can have a significant impact on physician diagnosis and management of patients in the emergency department.

135 MEDICAL STUDENT-PERFORMED POINT-OF-CARE ULTRASOUND: THE EFFECT ON PATIENT SATISFACTION IN THE EMERGENCY DEPARTMENT

D Lo, L Villarreal, AJ Sumnicht, S Gondra-Sanabria, D Udrea, R Chyan, V Dinh. *Loma Linda University School of Medicine, Cherry Valley, CA*

10.1136/jim-d-15-00013.135

Purpose of Study Although medical school ultrasound curricula guidelines have not yet been standardized, some programs have used student-performed point-of-care ultrasound (SP-POCUS) for educational purposes in the Emergency Department (ED) and elective rotations. This study set out to measure the effects that SP-POCUS might have on patient satisfaction in the ED.
Methods Used Patients at a Level I trauma ED in an academic institution were divided into two populations: a physician-indicated population in which SP-POCUS was potentially helpful to the diagnostic workup and an educational population in which SP-POCUS was mainly for student learning. Indicated patients were randomized into control (completed survey prior to SP-POCUS) and experimental (completed survey after SP-POCUS) groups. Educational patients were matched to controls (not receiving any SP-POCUS) based on length-of-stay and chief complaint. All patients completed a 5-question satisfaction survey based on a 5-point Likert scale. Experimental groups received an additional 5-question survey specific to SP-POCUS.
Summary of Results A total of 481 patients (200 Indicated and 281 Educational) were enrolled. Average patient satisfaction for Indicated SP-POCUS was 4.54 for the experimental group and 4.47 for the control group ($p=0.48$). Average patient satisfaction was 4.50 for patients receiving.

Educational SP-POCUS and 4.43 for matched controls ($p=0.43$). Patients reported feeling comfortable during Indicated SP-POCUS (4.51; confidence interval [CI] 4.36–4.67) and Educational SP-POCUS (4.61; confidence interval [CI] 4.50–4.72), and would recommend an ultrasound be performed on a patient with a similar chief complaint (Indicated: 4.38; confidence interval [CI] 4.21–4.56; Educational: 4.52; confidence interval [CI] 4.39–4.64).
Conclusions There were no significant positive or negative effects of SP-POCUS on patient satisfaction. Patients remained comfortable during exam and recommended that SP-POCUS be performed on a patient with a similar chief complaint. These results suggest that SP-POCUS may be used as a tool for clinical ultrasound education while maintaining quality patient-centered care.

136 CONCURRENT BIRT-HOGG-DUBÉ SYNDROME AND SARCOIDOSIS

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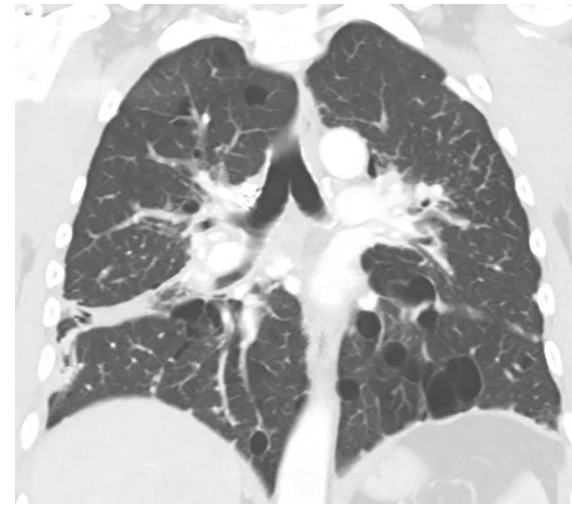
10.1136/jim-d-15-00013.136

Case Report While sarcoidosis is notorious for myriad manifestations including cystic lung changes, we present a case with both Birt-Hogg-Dubé syndrome (BHD) and pulmonary sarcoidosis. BHD is a rare, autosomal dominant genetic disorder from mutations in the *FLCN* gene, which encodes the tumor suppressor folliculin. The syndrome is characterized by clinical manifestations of skin fibrofolliculomas, renal cancer, and lung cysts. Although BHD is characterized by numerous thin-walled, irregular cysts, lung function is typically normal.

We report a 57 year-old man who previously presented with a pneumothorax and was subsequently diagnosed with cystic sarcoidosis after surgical lung biopsy revealed non-caseating granulomas in mediastinal lymph nodes and lung parenchyma. He was treated with prednisone, but developed worsening dyspnea prior to presentation to our clinic. Of note, he has two siblings with cryptogenic cystic lung disease.

Physical exam showed multiple small nodules on his face and fine rales at the bases of his lungs. Pulmonary function tests demonstrated severe restriction and a severe decrease in diffusion capacity. CT scan showed thin-walled, irregularly shaped cysts predominantly in the lower lobes, peribronchial thickening, and adenopathy. Genetic testing for BHD, a mutation in *FLCN*, was positive.

This is the first report of a patient with concurrent BHD and sarcoidosis. While the etiology of each disease remains cryptogenic, we will discuss potential pathogenic overlap and present a literature review on BHD including pathology, radiology, and genetics.



Abstract 136 Figure 1

Surgery I
Concurrent Session
3:30 PM
Thursday, January 28, 2016

137 ASSESSMENT OF A NOVEL, PORTABLE, TABLET-BASED SCANNER FOR THE THREE-DIMENSIONAL IMAGING OF THE FACE

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10.1136/jim-d-15-00013.137

Purpose of Study In recent decades, there has been growing interest and acceptance in three-dimensional imaging technologies in the planning and evaluation of aesthetic and reconstructive surgeries. Though demonstrated to be accurate and reliable, major drawbacks in surface 3D imaging systems have included cost, accessibility and ease of use. This pilot project explores the clinical potential for the first portable device, the Occipital Structure Sensor, to provide relevant data for patient care. The Structure Sensor has been described as a useful adjunct, or possible replacement of existing 3D imaging systems due to its low cost, speed and simplicity in non-clinical realms.

Methods Used The facial regions of twelve women before and after dermal filler injections were captured with the Structure Sensor mounted on an iPad mini using itSeez3d, an application for the iPad designed to scan faces and objects with the Structure Sensor. Scans were then converted to .obj files and evaluated with MeshLab, a third party 3D mesh processing software.

Summary of Results Each of the facial scans using the Structure Sensor took an average of sixty seconds and processing the scan into an .obj file took on average about six minutes. Volumetric differences after dermal filler injections were able to be appreciated in MeshLab, although exact volumetric computations through the software did not yield data that proved to have adequate precision in the 1–2 ml range. Scans taken by the Structure Sensor were compared qualitatively with previous scans taken with 3dMD, a traditional, fixed location 3D surface imaging systems.

Conclusions The Occipital Structure Sensor is the first iOS three-dimensional scanner of its kind and has shown potential for use in the operating room as well as the clinic for its ease of use and portability. Although quantitative analysis of the scans are yet to have adequate detail with current software, the Structure Sensor offers a fast, low-cost, easy to use addition or alternative to other 3D imaging systems. The Structure Sensor may serve as a possible solution to many of the limiting factors facing 3D imaging systems currently employed by plastic surgeons.

138 CROWDSOURCING FOR PATIENT-REPORTED OUTCOMES AFTER BREAST RECONSTRUCTION: A NOVEL TOOL FOR UNDERSTANDING THE PATIENT EXPERIENCE

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10.1136/jim-d-15-00013.138

Abstract 138 Table 1 Reported comorbidities and time duration until symptoms resolved

	Pain	Numbness	Tightness	Swelling
Unspecified symptom duration	8%	44%	27%	31%
Less than 3 months	63%	9%	32%	41%
Within 3–6 months	11%	0%	9%	14%
More than 6 months	13%	35%	32%	10%
No symptom	5%	12%	0%	4%
Total number of responses	n=103	n=34	n=49	n=29

Purpose of Study The growth of patient-initiated participation in online communities permits the feasibility of crowdsourcing - the process of enlisting web-based communities for health-related data collection. Crowdsourcing may be a valuable tool for understanding patient experience after breast reconstruction (BR), a topic with a paucity of information in current literature.The timeline of comorbidities after BR has not been fully investigated. Yet such understanding is crucial in preoperative counseling, upon which medical decisions are reached. The purpose of this study was to utilize crowdsourcing for insight on BR recovery process, and to compare patient responses to existing guidelines in literature.

Methods Used The online crowdsourcing platforms used were BreastCancer.org, RealSelf.com, MakeMeHeal.com, TalkAboutHealth.com, and BeyondTheShock.com. We compiled self-reported data on BR recovery time-stamped from 2006–2015. 213 responses were recorded and the frequency and duration of different patient outcomes were quantified. A literature search was conducted to compare professional guidelines to our crowdsourced data.

Summary of Results Clinical status and activities of daily living were catalogued**.** (Table 1).

Conclusions The data shows that a significant number of patients experienced pain, numbness, tightness, and swelling for more than 3 months. The timeline of when symptoms should resolve was not given in the American Society of Plastic Surgeons (ASPS) informed consent document for BR. Thus, crowdsourcing revealed much about recovery that literature fails to report, inevitably rendering a disconnect between what patients read in the guidlines and what they actually experience. Hence crowdsourcing may be a valuable tool for understanding the patient experience to ultimately help physicians better prepare and inform patients undergoing BR.

139 ADIPOSE DERIVED HUMAN MESENCHYMAL STEM CELL INJECTIONS IMPROVE ACHILLES TENDON HEALING IN A RAT MODEL

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10.1136/jim-d-15-00013.139

Purpose of Study Achilles tendon rupture is a common injury and optimal treatment remains uncertain due to

differing rates of infection, nerve injury and re-ruptures between surgical and non-operative methods. The purpose of this study was to determine the efficacy of injected perivascular stem cells (PSCs) on improving healing of a ruptured Achilles tendon in a SCID rat model.

Methods Used Two subtypes of PSCs were derived from human adipose tissue, pericytes (CD45−, CD31, CD34−, CD146+) and adventitial cells (CD45−, CD31−, CD34+, CD146−). 24 athymic rats (4 groups, n=6) underwent Achilles transection and received percutaneous injection 3 days postoperatively. Two control groups received injections of either saline or collagen hydrogel. Two experimental groups received injections of either $9x10^5$ pericytes or adventitial cells suspended in collagen hydrogel. At 3 weeks the rats were euthanized and tendon healing was evaluated by peak load and stiffness using biomechanical testing (n=4) and percent area of collagen using histologic analysis with picro sirius red staining (n=2). The animal experiments had approval of our institutional review board.

Summary of Results Mean peak load for saline, hydrogel, adventitial cell, and pericyte injection groups was recorded at 29.9N, 25.2N, 31.0 N, and 42.0 N respectively. Significant difference in peak load was observed between pericyte and hydrogel groups (p=0.007). Mean stiffness for the same 4 groups was recorded at 26.8 N/mm, 16.7 N/mm, 27.9 N/mm, and 42.3 N/mm respectively. Significant differences in stiffness were observed between pericyte and saline (P=0.02) and pericyte and hydrogel groups (P=0.002). On histological analysis, significant differences in area fraction of collagen were observed between the hydrogel and adventitial cell groups (P=0.002) and the hydrogel and pericyte groups (P=0.02).

Conclusions Though limited by the power of each group, our results suggest that injection of PSCs, pericytes in particular, improves mechanical properties of early Achilles tendon healing. Given these promising initial findings, further investigation may result in a viable translational therapy.

140 ANTERIOR CLOSING WEDGE PROXIMAL TIBIA OSTEOTOMY TO REDUCE ANTERIOR CRUCIATE LIGAMENT FORCE AND KNEE INSTABILITY

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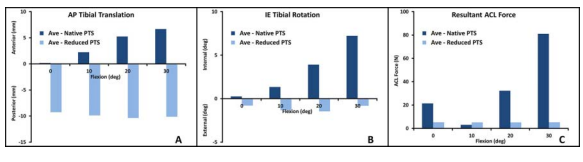
10.1136/jim-d-15-00013.140

Purpose of Study Over 70% of anterior cruciate ligament (ACL) injuries occur in noncontact situations, with the posterior tibial slope (PTS) of the tibial plateau believed to play a role. Even after repair, patients can experience instability and undergo failed reconstructions. Our hypothesis was that an anterior closing wedge osteotomy to decrease PTS would reduce ACL force and kinematic instabilities during knee loading.

Methods Used Two cadaveric knees were tested. Using an established technique, the femoral attachment of the ACL was mechanically isolated and attached to a load cell to measure ACL force. The tibia and femur were clamped in a 6-DOF robot at full extension. The robot flexed the knee from 0° to 30°, maintaining 500 N of joint compression. An 8° anterior closing wedge osteotomy was then performed. A wedge of bone was removed 20 mm distal to the tibial plateau. With the posterior cortical bone as a hinge, the plateau was lowered (reducing the PTS). Robotic testing was repeated.

Summary of Results At full extension, on average the closing wedge osteotomy shifted the position of the tibia relative to the femur 9.4 mm posteriorly and 1.0° externally compared to the normal knee (Figure 1A and B), resulting in an average reduction of ACL force of 16.1 N (Figure 1C). By 30° of knee flexion, on average the closing wedge osteotomy shifted the position of the tibia relative to the femur 16.8 mm posteriorly and 8.0° externally compared to the normal knee, resulting in an average reduction of ACL force of 75.8 N.

Conclusions Our initial testing suggests that an anterior closing wedge osteotomy alters relative tibiofemoral position, resulting in a decrease in resultant ACL force. While additional testing to increase the sample size, the results indicate that a PTS-reducing osteotomy may be a potential treatment for repeat ACL injury.



Abstract 140 Figure 1 A) anterior tibial translation, B) internal tibial rotation, and C) resultant ACL force comparisons between normal and osteotomized knees (n=2).

141 A RETROSPECTIVE AUDIT OF THE TREATMENT AND RECOVERY OF BREAST CANCER PATIENTS: BUILDING A PRELIMINARY BUNDLED PAYMENT MODEL FOR BREAST CANCER

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10.1136/jim-d-15-00013.141

Purpose of Study Bundled Payments for Care Improvement (BPCI) is a relatively new payment form that launched in 2013. Bundling pays the Affordable Care Organization (ACO) a fixed fee to treat a given medical condition. The medical service team retains the difference if the total cost of treatment is less than the bundled amount. However, the service providers are not compenstated for the difference if the total cost exceeds the bundled payment. Therefore, bundled care may allow different specialties to work closely together in order to deliver more efficent and better quality care. There are currently 4 models and 48 defined episodes of care, which focus mostly on cardiovascular and orthopedic procedures. A model for breast cancer has not yet been formed. Thus, the purpose of this study is to audit the different specialties involved in the treatment process of a breast cancer patient, and propose a preliminary model for bundled care payments for breast cancer patients.

Abstract 141 Table 1 Average percentage of RVU per specialty per patient

Anesthesiology	Family Medicine	Oncology	Pathology	Plastic Surgery	Radiology	Radiation Oncology	Surgical Oncology	Urgent Care	Total
0.13%	0.05%	5.80%	7.06%	54.92%	9.27%	1.97%	20.45%	0.34%	100%

Methods Used Ten patients who had their complete breast cancer care in a single institution were selected by using terminal surgery filtering criteria such as nipple tattooing, revision of breast reconstruction, fat grafting, and mastopexy. CPT codes reflecting procedures and E/M assessments of each specialty were obtained from a review of patient charts and billing history. CPT codes were then converted to RVU's. The average percentage of RVU per specialty per patient was then calculated.

Summary of Results See Table 1. for average percentage of RVU per specialty per patient.

Conclusions This study measured the relative contribution of various medical specialties to the overall care of breast cancer patients undergoing reconstruction. The data showed the specialties that spent the greatest resources with these breast cancer patients were Plastic Surgery, Surgical Oncology, and Radiology. This data may serve as a framework for creating a more comprehensive model for bundled care payment for breast cancer patients undergoing reconstruction, and to promote health service providers to coordinate across specialties to deliver more efficient and higher quality care.

142 ENDOSCOPIC AND OPEN VEIN HARVESTING TECHNIQUES PRODUCED SIMILAR VEIN QUALITY AND MAJOR ADVERSE CARDIAC EVENTS AT 5 YEAR FOLLOW-UP

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10.1136/jim-d-15-00013.142

Purpose of Study Various Methods of saphenous vein harvest techniques are used for coronary artery bypass grafting (CABG). One hypothesis is that the quality of the harvested saphenous vein has a significant effect on the outcome of the procedure. The purpose of this study is to determine if saphenous vein quality is impacted by endoscopic vein harvesting (EVH) and has a significant effect on the long term outcomes of coronary artery bypass.

Methods Used From January 2007 through December 2009, 323 consecutive patients underwent CABG at a single medical center. Endoscopic vein harvest (EVH) was performed in 278 patients compared to 47 patients who underwent open vein harvest (OVH). Surgical technique, saphenous vein characteristics and target artery measurements were prospectively collected. Patient records were retrospectively analyzed for major adverse cardiac events (MACE). We defined MACE as all-cause mortality, myocardial infarction, or re-operation on previously grafted vessels.

Summary of Results Saphenous vein width was not associated with a difference in MACE (4.5 mm for MACE vs. 4.6 mm for non MACE population, p=ns). Saphenous Vein-Target artery mismatch (saphenous vein width/target artery internal diameter) was likewise not associated with a difference in MACE (2.87 for MACE vs. 2.91 for non MACE population, p=ns). Presence or absence of Saphenous vein tears had no correlation with MACE incidence (18.0% of MACE vs. 19.6 % of the non MACE population had the presence of tears, p=ns). Presence of adhesions (defined as dense, moderate or mild) similarly was not correlated with MACE incidence. There was a trend towards number of tributaries correlating with an increased incidence of MACE (an average of 16.25 tributaries for MACE vs. 15.22 for non MACE population), however, it did not reach statistical significance (p=0.0889). Vein harvest technique (EVH vs. OVH) did not impact the overall MACE incidence (42.0 % vs. 41.3% respectively, p=ns).

Conclusions EVH and OVH techniques did not impact the quality of saphenous veins harvested and produced similar MACE rates at 5 year follow-up. We found a suprisingly high incidence of major adverse cardiac events following CABG at long term follow-up.

143 STEPPING OUT OF THE SHADOW: INVESTIGATING A TEACHER-LEARNER CONTRACT FOR OBSERVERSHIPS IN THE CLINICAL SETTING

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10.1136/jim-d-15-00013.143

Purpose of Study Shadowing in the clinical setting is seen as an opportunity to expose students to the practice of surgery. These experiences are opportunities to observe the application of curricular concepts and motivate students to further explore prospective careers. However, negative experiences can thwart these goals and discourage students and surgeons. With vague objectives and unclear expectations in the current model, are we setting students and faculty up for unproductive shadowing experiences?.

Our aim was to provide a structured objective-based framework for both faculty and students in the shadowing experience. We piloted a Teacher-Learner Contract (TLC) to test this concept and its utility in the shadowing context.

Methods Used In this prospective pilot study 10 preclerkship medical students and 10 surgeons across three teaching hospitals were paired to test the framework within ward and OR settings. To ensure a genuine experience, participants were given autonomy to apply the TLC to their

individual learning needs. Participants were then interviewed to collect qualitative feedback.
Summary of Results Results indicate students perceived the TLC concept to provide a clearer structure, and the objectives to be applicable to their learning. Surgeons shared similar feedback but suggested the need for institutional support to accomplish broad-based adoption by staff.
Conclusions The TLC is based on adult learning concepts wherein students and faculty are equally accountable in the learning process. This study indicates participants consider the TLC as a resource to structure and enhance experiential learning opportunities. Also, the concept is not confined to surgery and has broader applications in medical education.

144 PATIENT SPECIFIC 3D PRINT MODELS IMPROVE DEFORMITY CORRECTION AFTER PROXIMAL FEMORAL OSTEOTOMY FOR SLIPPED CAPITAL FEMORAL EPIPHYSIS

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10.1136/jim-d-15-00013.144

Purpose of Study Slipped capital femoral epiphysis (SCFE) results in a three-dimensional (3D) deformity of the proximal femur that limits hip range of motion. A flexion, valgus, internal rotation producing proximal femoral osteotomy (Imhauser) has been described to improve hip mechanics. We evaluated the benefits of using 3D print technology to aid in surgical planning. We hypothesized that models would decrease surgical time and fluoroscopy time, and improve radiographic deformity correction.
Methods Used Ten consecutive patients with post-SCFE severe proximal femoral deformity, treated with a 3D osteotomy by a single surgeon were included. Pre-operative CT data was used to create patient specific 3D printed models in five patients. A mock surgery was performed using these 3D prints to plan correction. Radiographic data included Southwick slip angle (SSA), neck shaft angle (NSA), trochanteric tip to articular distance (TAD), and medial proximal femoral angle (MPFA). A Mann-Whitney U test was used to compare data between patients who had a 3D model made (n=5) and patients that did not (n=5).
Summary of Results Subjects in both groups were similar in height (p=0.68), weight (p=0.94), and BMI (p=0.98). Radiographic deformity was not statistically different preoperatively. Radiographic parameters were significantly improved in the model group compared to those without a model for SSA (p=0.03) and TAD (p=0.01), but not NSA (p=0.55) and MPFA (p=0.09). Though not significant, surgical time decreased by 50 minutes (p=0.69), and fluoroscopy time decreased by 50% (p=0.23).
Conclusions Patient specific 3D models significantly improved post-operative deformity correction. Although surgical time and fluoroscopy time decreased substantially, a larger sample size is likely required to demonstrate statistical significance. 3D models can be an invaluable surgical tool to improve surgical outcomes.

Abstract 144 Figure 1

145 WRIST MOTION VARIATION BETWEEN NOVICES AND EXPERIENCED SURGEONS PERFORMING SIMULATED AIRWAY SURGERY

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10.1136/jim-d-15-00013.145

Purpose of Study The gold standard for surgical performance evaluation is the Objective Structured Assessment of Technical Skills (OSAT) that uses expert raters and is thus costly. Wrist motion measured by a smartphone application has been shown to vary between novices and experts performing craniotomy and laparoscopy. This low-cost tool may serve as a performance metric. It has not been used in otolaryngology procedures that may require greater digital dexterity. We aimed to determine whether it can be used for a simulated airway procedure requiring both wrist and finger dexterity. We hypothesized that the accelerometer application could detect differences between novices and experienced surgeons performing this task.
Methods Used Voluntary surgeons and non-surgeons were recruited. After viewing a training video, smart-phones with accelerometer applications were strapped on both wrists while the subjects performed a cricothyrotomy on a previously validated task trainer. Procedure time and motion parameters, including Average Resultant Acceleration (ARA), Total Resultant Acceleration (TRA) and Suprathreshold Acceleration Events (STAEs) were collected for dominant and non-dominant hands. Subjects were stratified according to prior experience with similar procedures. T tests were used to compare performance in novice and experienced subjects.
Summary of Results Thirty subjects were enrolled. Mean age was 29.7 and 20 subjects were male. In the dominant hand, significant differences were seen between novice and experienced surgeons in TRA (p=0.005) and procedure time (p=0.006), while no significant differences were seen in STAEs (p=0.42) and ARA (p=0.33). In the non-dominant hand, all variables were significantly different between the two groups: STAEs (p=0.012), ARA (p=0.007), TRA (p=0.004) and procedure time (p=0.006).
Conclusions This study suggests wrist motion measured by a low-cost smartphone application can distinguish between novice and experienced surgeons performing simulated airway surgery. This tool may provide more cost-effective performance feedback than traditional OSATs.

146 FABRICATIONS IN THE FOUNTAIN OF YOUTH: EVALUATION OF COLLAGEN INDUCTION CLAIMS IN PRODUCT ADVERTISING

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10.1136/jim-d-15-00013.146

Purpose of Study In the quest for youth, collagen has been implicated as a contributing factor in aging skin. Many at home and filler techniques have not been scrutinized for their induction claims. To date, no studies have compared anti-aging products for their ability to stimulate collagen. We attempt to evaluate level of evidence for current products' collagen stimulation and offer a flowchart method for clinical evaluation.

Methods Used "True Beauty" magazine was examined for advertisements claiming to reverse aging by lifting, firming, or stimulating collagen. Using company websites, products claiming collagen stimulation were included. Peer-reviewed journals were consulted to provide evidence or dispute claims, while analyzing for fiduciary relationships. Primary endpoints included collagen production, as shown by qualitative (immunohistological staining) or quantitative measures. The studies were rated as shown in the table. Lastly, we offer a flowchart method of evaluation of anti-aging products.

Summary of Results The table illustrates number of products with each study type rating as evidence for claims. No at-home devices or ingestible liquids proved collagen production. Only 2 of 10 creams had level I to III evidence suggesting ability to penetrate dermis to induce collagen.

Conclusions Most collagen induction claims lack scientific evidence. While fillers showed histology of collagen induction, this is likely due to force on fibroblasts rather than upregulation of procollagen mRNA. Portions of injectable fillers likely remain in the dermis longer than indicated. When recommending anti-aging products or services as a physician or choosing as a consumer, one must examine the evidence for objective support of claims in a structured manner.

Abstract 146 Table 1 Study Type Rating

I	In vivo Human
II	In vivo Alternate Location
III	In vivo Animal
IV	In vitro
*	Funded by Company
N	Study shows no increase

Abstract 146 Table 2 Results

Type of Product (n)	I	II	III	IV	N
Cream (10)	2	1	0	3	4
Ingestible Liquid (1)	0	0	0	0	0
At-home device (3)	0	0	0	0	2
Filler (3)	0	3*	2	0	1

*All had funded research.

Poster Session
Adolescent Medicine and General Pediatrics
6:00 PM
Thursday, January 28, 2016

147 COMMUNITY HEALTH ASSESSMENT OF INFANTS IN RURAL INDIA

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10.1136/jim-d-15-00013.147

Purpose of Study Malnutrition and low growth in children are predictors of morbidity and mortality. Routine assessment of malnutrition and other risk factors in developing countries is often limited, particularly in rural areas. The objectives of this study were to follow a local hospital field worker and obtain information on the children that he visited to assess for malnutrition and other risk factors.

Methods Used This study took place in a rural area of Gujarat, India, including 18 villages. From 6/30/15 to 7/10/15 we participated in and observed community health visits to infants in their areas of residence. These children were either referred to the field worker by community health workers or were born in the local hospital. During these visits, a number of data points were collected including name, gender, age, village of residence, vital signs, height, weight, and whether or not they had previously been seen by a community health worker. They were also assessed for several danger signs including: fever, respiratory distress, diarrhea, wasting and edema. Using the information gathered, we also calculated z-scores for each child, when possible. A standardized data collection sheet was utilized to obtain this information.

Summary of Results We observed and participated in 25 visits to infants in 18 rural villages. The average age of the children seen was 3 months, 15 days old but spanned from 3 days old to 1 year, 4 months, 4 days old. There were 12 males and 12 females and one child whose gender was not obtained. None of the children were found to be febrile and all except one had respiratory rates that were within the normal range. One child was found to be in respiratory distress and was immediately referred to the local hospital in Mota Fofalia. Of the children for which we could calculate z-scores, the average for height-age was –1.52 SD with 16% of children being ≥2 SD below the mean, average for weight-age was –2.46 SD with 72% of children being ≥2 SD below the mean, and the average for weight-height was –2.10 SD with 36% of children being ≥2 SD below the mean.

Conclusions Although most did not show overt signs of distress (i.e. fever, edema, etc.), the majority of infants in this sample were more than one SD below the mean for growth and showed evidence of malnutrition.

148 PARTNERSHIP WITH THE DISCOVERY SCIENCE CENTER: TOWARDS INCREASING DIVERSITY IN HEALTHCARE AND THE INCLUSION OF THE SMOKING LUNGS MODEL

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10.1136/jim-d-15-00013.148

Purpose of Study Our project aims to increase the interest of a diversified population of youth toward healthcare and biomedical science fields through an interactive activity and to educate youth about the negative effect of smoking.

Methods Used Through partnership of UC Irvine School of Medicine and the Discovery Science Center in Santa Ana, CA, we established an interactive exhibit in 2011 using human lung simulator. In 2013, we added a smoking lung model to teach the young visitors about the hazards of smoking. College pre-health students served as volunteer mentors and introduced the young visitors to the human respiratory system. Under the guidance of the mentors, the visitors practiced intubating a human simulator. By using the Smoking-Lung model, they were asked to think critically and identify between smoker lungs and non-smoker lungs. The coaches also guided the discussion to help youth comprehend the dangers of smoking. The results of feedback surveys are summarized below.

Summary of Results Of 1220 respondents, 27.4% were Hispanic, 42.5% Caucasian, 26.2% Asian, and the rest belonged to others ethnicities. 86% of respondents indicated that their interest increased in learning about anatomy and functions of the human body, over 50% said that they were more interested in healthcare career as a result of this exhibits, and 90% expressed that these activities should be included in their school's science program. Since March 2013, 485 of 1220 surveys contained data about the Smoking-Lung model. Of those, 94% indicated that their awareness about the danger of smoking has increased, and 89% said that they were less inclined to smoke in the future as a result of this demonstration. Lastly, of 1220 respondents, 85% left positive comments. Among these were: 1) "I really like how they let us try the experiment ourselves, and they put us in the position of a real doctor," 2) "I loved it! I think this should be done at local school. Very informative and it could inspire the students to study human anatomy," and 3) "The activity has made me more aware of the effects of cancer and smoking".

Conclusions In conclusion, our exhibit has been very effective in fostering the interest of a diverse population of youth towards healthcare professions while demonstrating the hazards of smoking.

Poster Session Cardiovascular 6:00 PM Thursday, January 28, 2016

149 IS ELECTROCARDIOGRAPH (EKG) NECESSARY FOR PRE-PARTICIPATION SCREENING OF ALL YOUNG ATHLETES?

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10.1136/jim-d-15-00013.149

Purpose of Study The purpose of our study is to review the literature on the value of EKG screening in high school and college athletes prior to participation in sports.

Abstract 149 Table 1

Reference	Study Type	# Patients Studied	# Patients with Abnormal EKG	# Patients identified at high risk for SCD	Number with normal H&P but abnormal EKG	Tests used to identify the patients at risk?	# False positive EKGs
Drezner, 2015	Retrospective	790	22 (2.8%)	5 (0.6%)	4 (80%)	EKG	17 (2.2%)
Mayer, 2012	Prospective	692	71 (10.3%)	25 (3.6%)	32 (4%) had either abnormal history or physical exam	EKG and echo	Not mentioned
Anderson, 2014	Prospective	659	79 (12.0%)	5 (0.8%)	Of 79 with abnormal EKG, 11 (14%) had abnormal H&P	Physical, ECG, then ECHO was done	Not mentioned
Fuller, 1997	Prospective	5,615	146 (2.6%)	Not mentioned	History was negative in all and Physical detected 1/5615	History, physical and EKG	130 (2.3%)
Price, 2014	Prospective	2,017	62 (3.1%)	5 (0.2%)	History and physical detected 2 of the abnormalities at risk for SCD	History, physical, ECG, then ECHO	2 (0.2%)
Le, 2010	Retrospective	658	222 (33.7%)	8 (1.2%)	Not mentioned	History, physical, then EKG	Not mentioned
Riding NR, 2015	Prospective	2,491	132 (5.5%)	10 (0.4%)	Not mentioned	Used \"Refined Criteria\"* Cardiovascular screening, ECG, then ECHO	specificity 94%

*Refined criteria is a combination of Seattle Criteria and European Society criteria. Only those who fulfilled the Refined Criteria, would get further testing, such as stress test or echo.

Methods Used We conducted a systematic literature review through PubMed, Google Scholar, and Cochrane Databases. We included studies that focused on individuals between the ages of 14–22 who had underwent an EKG screening in addition to the history and physical to determine their risk of major cardiac abnormalities.

Summary of Results Our initial search yielded 26 different studies, but due to age criteria and lack of pertinent information, we refined the list to only 7 studies (see table 1). All studies included a medical history and physical (H&P) as well as EKG as part of screening but used different criteria to identify those who needed further workup. Most of the studies identified false positive EKG results. Moreover, majority of participants with EKG abnormalities, had a normal H&P. When "Refined Criteria" was used, the number of false positives decreased.

Conclusions Our research shows that cardiac-focused H&P is necessary for identifying patients at risk for sudden cardiac death (SCD) but some patients may not be identified through H&P only. The studies used variety of interventions and different criteria to identify "abnormal EKGs" and the criteria used led to some false positive EKGs. It remains unclear whether lowering the risk of SCD by mass EKG screening is cost effective and worth the ramifications that result from false positive EKGs. Further research is needed to evaluate the H&P screening combined with SCD emergency action plan program.

150 USE OF MEDICAL MARIJUANA FOR TREATMENT OF PEDIATRIC PATIENTS WITH EPILEPSY

MR Carrillo,[1,2] GE Jennings,[2] C Le,[2] A Dong,[2] D Devineni,[2] R Sahafi,[2] H Goo,[2] B Afghani[2,3]. [1]*Creighton University, Huntington Beach, CA;* [2]*UC Irvine, Irvine, CA;* [3]*CHOC Children's Hospital, Orange, CA*

10.1136/jim-d-15-00013.150

Purpose of Study The purpose of our study was to research whether medical marijuana is a plausible treatment for children with epilepsy.

Methods Used We performed a systematic literature review through PubMed, Google Scholar, and the Cochrane Databases and searched for any studies that used medical marijuana to treat epileptic pediatric patients.

Summary of Results We found 3 parental surveys and 2 case reports (see table below). Although majority of studies, reported decreased seizures while on marijuana, short term adverse effects including increased appetite, drowsiness, and fatigue were noted. Increased seizures were reported in a minority of patients. The dosages used were very variable and long term follow up was lacking. A description of patients' baseline status and development was lacking is some of the reports.

Conclusions Studies on long term effectiveness and side effects of medical marijuana on patients with epilepsy are limited. Our review of a few studies suggests that marijuana may reduce seizure frequency on a short term basis in some

Abstract 150 Table 1

Reference	Study Type	# of Patients	Age	Outcome	Dose Used	Other Epileptic Drugs	Adverse Effects	Follow Up Time	Duration of Study
Press, 2015	Parent Survey	75	3 weeks to 18 years	57% some improvements; 33% had greater than 50% reduction in seizures; 0.3% had seizure freedom	Not given	None Reported	44% including increased seizures (13%) and somnolence/ fatigue (12%)	Less than 6 months	5.6 months
Porter, 2013	Parent Survey	19	2 to 16 years	84% seizure reduction; 11% complete seizure freedom; 42% had >80% seizure reduction	0.5–28.6 mg/ kg/day	63% tried an average of 12 other antiepileptic drugs before using cannabis. 95% experienced treatment-resistant epilepsy for more than 3 years before trying cannabis.	37% drowsiness and 16% fatigue	None	Average 4 months to see results
Hussain, 2015	Parent Survey	117	5.5 months to 18 years	85% had reduction in seizure; 14% had complete seizure freedom	2.9–7.5 mg/ kg/day	8 failed medications prior to CBD exposure	12.8% drowsiness, 29.9% increased appetite and 9.4% fatigue	None	Changes in seizure frequency were typically observed after 2 weeks
Maa, 2014	Case Report	1	Started at 3 months end of study	Seizures reduced down to 2–3 nocturnal seizures per month	4 mg/lb per day	Was on clobazam but proved not effective	None Reported	Reported improved behavior daily	20 months
Saade, 2015	Case Report	1	Started at 39 weeks until 10 months	Seizures decreased from 10–20 per day to up to 9 days with no clinical seizures	25 mg/ kg/day	Phenobarbital, levetiracetam, carbamazepine,clonazepam, fosphenytoin. topiramate	None Reported	Improvements seen and noted daily	10 months

pediatric patients with epilepsy. However, large controlled studies that take into account long term effectiveness as well as side effects on different organs are needed.

151 PEDIATRICS CHEST PAIN AND UTILIZATION OF EXERCISE STRESS TEST AND ECHOCARDIOGRAM

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10.1136/jim-d-15-00013.151

Purpose of Study Chest pain is a common presenting complaint amongst pediatric patients and unlike adults, the majority of diagnoses are non-cardiac. Echocardiogram and exercise stress testing (EST) are often used to rule out a cardiac cause, but the utilization rates in pediatric patients have not been studied at the University of California Davis Health System (UCDHS). The results from this study can be used to help us understand current resource utilization, reasons for the utilization decisions, and to potentially support the implementation of Standardized Clinical Assessment and Management Plans (SCAMPs).

Methods Used We reviewed records of 739 patients aged 0–17 who presented to UCDHS with a chief complaint of chest pain during a two year period from February 1st, 2013 to February 1st, 2015. Data reviewed included patient demographics, the clinical diagnosis, and whether an echocardiogram and an EST were performed. We also surveyed all 5 pediatrics cardiologists in the department in order to specifically evaluate reasons for their decision-making with regard to ordering an echocardiogram and/or EST in this setting.

Summary of Results 28 patients (3.79%) had an EST (most in conjunction with echocardiogram) and 109 patients (14.75%) had an echocardiogram without EST. There were no statistical differences ($P>0.05$) in race/ethnicity, gender, languages spoken, and age ranges with regard to the ordering and performance of the testing. The most common etiologies for the chest pain in this cohort were unknown (56%), pulmonary (17%), and musculoskeletal (15%). All 5 surveyed pediatrics cardiologists were reluctant to perform testing without a specific indication in the patient history. Lack of an easy access to testing as well as incomplete data may also be reasons for a decreased incidence of testing,especially in the case of EST.

Conclusions The utilization of echocardiogram and EST at UCDHS for pediatric patients with chest pain was lower than what is described in the literature. Formal implementation of SCAMPs may not always be necessary to thoughtfully implement a cost-effective utilization strategy. UCDHS is on the process to build in a new stress lab to increase access for EST.

152 LEFT VENTRICULAR SHAPE VARIATION IN PATIENTS WITH AORTIC COARCTATION PRE- AND POST-STENT IMPLANTATION

A Ortiz,[4] A Suinesiaputra,[1] A Young,[1] G Farrar,[3] B Printz,[2,3] H El-Said,[2,3] J Moore,[2,3] J Omens,[3] A McCulloch,[3] J Perry,[2,3] S Hegde[2,3]. [1]*U of Auckland, Auckland, New Zealand;* [2]*Rady Children's Hospital, San Diego, CA;* [3]*UCSD, La Jolla, CA;* [4]*UCSD SOM, La Jolla, CA*

10.1136/jim-d-15-00013.152

Purpose of Study Very few studies of Left ventricular remodeling (LVR) in patients with aortic coarctation (CoA) exist due to lack of detailed geometric models. The Cardiac Atlas Project (CAP), a worldwide consortium for pooling standardized analyses of cardiac images for mapping heart shape and motion, provides a unique opportunity to study cardiac remodeling. This study compares LV shape in a sample of CoA patients pre- and post-stent to normal patients from the CAP with the goal of developing model-based predictions of LVR to guide clinical management.

Methods Used Cardiac magnetic resonance images (CMRI) and clinical data of five patients with CoA were collected. CMRI 1–2 years post-stent implantation were available for four patients. Patient-specific geometric models were built from pre- and post-stent CMRI using guide-point FEM software (CIM, University of Auckland, New Zealand). Shape modes at end-systole (ES) and end-diastole (ED) were derived using principal component analysis (PCA) of a population ($n=1991$) of asymptomatic volunteers from the CAP. PC scores describing the deviation of each CoA model from the asymptomatic PCA model distribution at ED and ES for various shape modes were calculated.

Summary of Results In order, PC modes (M1-M4) represent variance in: 1) LV size, 2) sphericity and wall thickness (WT), 3) mitral valve orientation (MVO), and 4) WT and MVO. Most PC scores are <2.0, indicating model shapes are within two standard deviations of the control population. At ED and ES pre-stent, the largest absolute PC score for most patients is for M4, which predominantly represents WT and MVO.

Conclusions Preliminary results with a small sample size comparing LV geometry of CoA patients against atlas-based controls show LV shape characteristics that are similar to the normal LV. Notable characteristics post-stent include changes in WT and MVO, which suggest remodeling. These short-term changes may predict future hypertrophy and decreased LV function. In combination with future patient-specific biomechanics models, we anticipate that detailed quantification of cardiac shape will help advance the potential for early recognition of remodeling patterns to guide timely clinical management.

Poster Session
Community Health
6:00 PM
Thursday, January 28, 2016

153 CREATE CULTURALLY APPROPRIATE CERVICAL CANCER INFORAMTIONAL MATERIAL TO DISTRIBUTE DURING CERVICAL SCREENINGS AND COMMUNITY OUTREACH EVENTS AT THE UGANDA CANCER INSTITUTE

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10.1136/jim-d-15-00013.153

Purpose of Study Cervical Cancer is the most common cancer to affect women in Uganda. In 2007, 72% of patients diagnosed with cervical cancer in Uganda were in the third or fourth stage, greatly reducing survival rates. Ugandan women are more susceptible to cervical cancer due to a higher prevalence of the Human Papilloma Virus (HPV) and a lack of awareness of its cause. This project evaluated and strengthened the current cervical cancer educational material to make them more sustainable and culturally appropriate. The goal was to educate and motivate Ugandan women to utilize cervical cancer prevention methods.

Methods Used Through informal interviews with health care workers and community members at the Uganda Cancer Institute (UCI), the current educational material was evaluated and improved. Feedback through eight informal interviews with community members during cervical screenings indicated a need to simplify content and create a version of the leaflet in the local language. The English version was translated into Luganda and further refined by health educators and cancer survivors working at the UCI.

Summary of Results Informal interviews with 12 patients, three health educators, two nurses, two cancer survivors and one physician directed the revision and improvement of the brochure to contain simplified English with descriptive pictures of how cancer forms and HPVs involvement. A local language version was also produced. Two thousand leaflets were printed for future distribution at community outreach events, 1000 in each language. Involving the staff throughout the process of developing the educational material resulted in a stronger internal motivation within the team to raise awareness and institute change. Electronic versions were given to the health educators for future needs.

Conclusions The dual versions of this culturally appropriate leaflet increased awareness for a disease that affects millions of women. The leaflets will be given to patients while they wait to speak with the health educators who will then discuss any questions they have. The project will be sustainable with cooperation of the health educational team who will distribute the updated English and Luganda cervical cancer leaflets weekly and at the community outreach programs.

154 DILLON, MONTANA: SEXUAL EDUCATION ADVANCEMENT

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10.1136/jim-d-15-00013.154

Purpose of Study Purpose: Sexual Education Advancement aims to inform sexual education teachers about public views on the course's content and also add topics to the course.

Background Dillon, MT, is a rural town that has a small university and is the chief medical center for Beaverhead County- totaling over 9,000 people. As a state, Montana's STD rate is 275% above the national average, and Beaverhead County's STD rate is 27% above that of the state of Montana.

Methods Used Methods: Many citizens felt that education in the high school was not as thorough as it could be because of two main problems: some of the teachers do not believe that students have sex; and teachers do not know what material the public believes they should/should not cover. After meeting with the Beaverhead County Public Health Director, the Advancement became directed towards sexual education teachers. A literature search was done to determine how in depth the public thought Sex. Ed. should be, including the opinions of teachers, parents, and students. Some of the notable findings from the review were: only 1.1% of parents discussed sexual topics at home; 84% of students could not name a specific STD; students taught by nurses had better retention rate of information after one year; 81% of parents thought that STD and pregnancy prevention should be included in the education; and, close to half of high school students reported needing more information from their Sex. Ed. course.

Summary of Results The literature review revealed that parents, students, and teachers all favored a more informative program. A handout was written for the future teachers of Sex. Ed. in Beaverhead County that listed the statistics found, in the hopes that seeing the public support in numbers would encourage them to not shy away from difficult topics. A comprehensive sex presentation was also developed that will be delivered this summer to the MYCA (Montana Youth Challenge Academy) - a program for 16–18 year old kids that are high-risk.

Conclusions Discussion: The Sex Ed Advancement will take affect after the students return to school. The handout will be given to the educators, the presentation will be delivered to the MYCA by a public health nurse, and the students will be analyzed six months later to determine if they retained the information. If success is seen then the presentation will become part of the program permanently.

155 EVALUATING THE CHALLENGES OF INTEGRATING HEALTH EDUCATION INTO A SCHOOL CURRICULUM IN RURAL INDIA

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10.1136/jim-d-15-00013.155

Purpose of Study The University of British Columbia's Global Health Initiative (GHI) Spiti Valley Project has been

collaborating with Munsel-ling School in India's Spiti Valley since 2007. Due to geographical and environmental conditions, the valley is inaccessible for most of the year. This region is highly underserviced with limited access to both healthcare and education. In 2008, GHI partnered with Munsel-ling School leaders to develop a health education curriculum for the school which was delivered in 2009 (with revisions in 2010 and 2015). Despite strong interest from the school leader, this resource has not been integrated into the government-mandated curriculum at Munsel-ling. This evaluation addresses the challenges faced by the GHI team in implementing a health curriculum at Munsel-ling School and the development of proposed solutions to such barriers.

Methods Used In 2008, the GHI team worked with school staff to develop a curriculum about hygiene, hand-washing, teeth brushing, smoking, women's health and diarrheal diseases. A Students' Health Council (SHC) consisting of senior students was developed in 2010 to address the need for sustainability as teachers were unable to accommodate the material into classes. In 2015, Munsel-ling asked for a more comprehensive curriculum detailing learning objectives, lesson plans, competency goals, and assessment activities. The school prioritized the following topics: oral health, hand-washing, nose-blowing, and toileting hygiene, diarrheal disease, and water safety. Interviews with the school director, principal, teachers, and student leaders were held to evaluate operational challenges to implementing the curriculum.

Summary of Results Several issues that affected health curriculum integration were identified: lack of infrastructure in leaders' roles resulting in the disbandment of the SHC, miscommunication regarding program leadership, inability to incorporate the curriculum into an already packed curriculum, and overworked or disinterested staff.

Conclusions In order for the GHI health curriculum to be fully incorporated into the Munsel-ling curriculum, the context in which the curriculum is being integrated into needs to be considered in additional to the educational content and its level of appropriateness to each age group.

156 PREVENTING CHILDHOOD OBESITY ON PRINCE OF WALES ISLAND: IDENTIFICATION OF BARRIERS THAT HINDER HEALTHY LIFESTYLES AT HOME AND TARGETING PARENTS IN OBESITY PREVENTION EFFORTS

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10.1136/jim-d-15-00013.156

Purpose of Study This project serves to evaluate the barriers at home that prevent school-age children from living a healthy lifestyle through a parent survey. The project also aims to provide meal planning and shopping assistance to encourage healthy eating.

The rising national obesity epidemic in our nation has not spared Prince of Wales (POW) Island in Southeast Alaska. In fact, the rate of adult obesity was 36% in 2013—the highest rate in Alaska. Childhood obesity is also a rising concern and there are a number of prevention efforts on POW Island targeting children. However, parents' behavior can strongly influence their children's lifestyle, and many prevention efforts fail to address obstacles children may face at home.

Methods Used Members of the community, including a diabetes educator, public health nurse, parents, school faculty, and a business manager were interviewed to obtain knowledge of barriers at home that prevent children from living a healthy lifestyle. A review of current literature served to investigate these barriers and give insight on interventions that might prevent childhood obesity on POW.

Summary of Results A partnership with the Prince of Wales Health Network (POWHN) was established to develop the following interventions: 1) Survey parents to determine barriers toward healthy lifestyles at home; 2) Develop a healthy recipe bank and create weekly meal plans for parents; 3) Offer monthly educational workshops aimed at teaching skills that promote healthy living. The POWHN was provided with a literature review that supported the proposed interventions and a project outline of how to implement them by integrating them into current projects and grants. These were discussed during a summary meeting with stakeholders.

Conclusions To achieve maximal success in childhood obesity prevention, parents should be targeted to encourage healthy living at home. The proposed interventions on POW may support children to develop healthy habits that will last a lifetime. However, because communities on POW Island are very spread out, resources may be spread thin. Therefore, local community leaders should be trained to lead workshops and prevention efforts to ensure sustainability.

157 CHILD NUTRITION EDUCATION FOR LIFELONG HEALTHY EATING HABITS IN MÁI DÂM COMMUNE, VIETNAM

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10.1136/jim-d-15-00013.157

Purpose of Study In Mái Dâm Commune, hypertension and diabetes have become two of the leading causes of illness. Changing lifestyle habits, such as increased intake of processed foods and decreased physical activity, are possible culprits in this shift in disease burden. Previous programs to address these issues focused on adults with established hypertension or diabetes. An avenue to prevent these diseases that has not been used is nutrition education for children. Primary school-aged children are facing high rates of both overweight and stunting in Vietnam. Children in this community have imbalanced diets, with many having low protein and vegetable intake and a high intake of white rice and junk food. These children are developing lifelong eating habits and starting to make food choices outside the home, which makes them excellent targets for nutrition education. This project sought to address the issue of imbalanced nutrition by implementing an education program for primary school children.

Methods Used Thirteen informal interviews were conducted with key informants in Mái Dâm to identify issues with improving nutrition. The lesson plan was developed

using CDC resources and the Vietnam Dietary Guidelines, and was revised by staff at Can Tho University Medicine and Pharmacy. Preventive Medicine Doctor students from CTUMP were trained to deliver the lesson plan to primary school-aged children. A pretest and posttest was used to assess children's knowledge following each lesson.

Summary of Results Nine PMD students delivered the nutrition lesson to 143 primary school students and 62 parents. Five sessions were held, one for each grade level 1st–5th, and each student took home an educational poster. Students were able to model the recommended amounts of food in proportion to each other. The knowledge test average increased from 59% to 63%.

Conclusions Students improved knowledge of the definition of a balanced diet, good sources of nutrients, and how to eat a balanced diet. This program will be incorporated into the PMD curriculum at CTUMP, where students will teach this program in other communes. It is recommended that future use of this program be focused on 5th graders, as they seemed most receptive to the program. Additional work should focus on creating an environment that supports good eating habits for the children.

158 SNAKE RIVER COMMUNITY CLINIC MINDFULNESS PROGRAM

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10.1136/jim-d-15-00013.158

Purpose of Study To provide anxiety reducing mindfulness techniques to patients at the Snake River Community Clinic (SRCC) in Lewiston, Idaho.

Lewiston located in Nez Perce County and has a population of 32,401. 20% of adults and 9% of children in Nez Perce County are uninsured. SRCC serves people who are uninsured or under-insured and provides them with free medical care and prescriptions. Many of the patients that attend the free clinic have anxiety and may also be suffering from another mental health problem. While patients are waiting to be seen by the physician and waiting for their prescriptions, there is often an educational presentation.

Methods Used Through community conversations and interactions in clinic, it became apparent that there is a need for mental health resources in Lewiston and the surrounding area. A literature review was conducted and a proposal was made to Charlotte Ash, coordinator of SRCC, about giving a presentation about mindfulness and its benefits in helping to treat anxiety and stress. Multiple studies found that Mindfulness Based Stress Reduction is effective at reducing anxiety, most notably only 20 minutes a day can provide up to 22% reduction in anxiety. Studies also found that with practicing mindfulness, there are long-term physical changes in the brain.

Summary of Results The SRCC Mindfulness Program was implemented by giving a presentation with a sample three minute guided meditation, resource handout and literature review to Charlotte Ash. Charlotte was also provided with additional guided meditation audio to use at later dates for interested patients. The intervention was informally proposed to patients and they felt it would be a helpful non-medication intervention that one could do at home.

Conclusions The next step of this project is to give the presentation at SRCC and pass out the resource handout. Strengths of this project are that patients are able to meditate anywhere, at no cost, and benefits are seen after short amounts of time. Some barriers include patients' willingness to try a new therapy as well as finding time throughout the week to practice at home in order to receive the greatest benefit. This program will continue at SRCC on a quarterly basis.

159 THE FIVE-YEAR CUMULATIVE INCIDENCE OF BURNS IN UGANDA: EARLY OUTCOMES OF A CROSS-SECTIONAL HOUSEHOLD SURVEY

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10.1136/jim-d-15-00013.159

Purpose of Study The purpose of this study was to determine the five-year cumulative incidence of burns in Uganda. The secondary objective was to calculate risk factors for burns in Uganda.

Methods Used This study used a cross-sectional household survey with multistage probabilistic sampling to select households in Uganda's Eastern Region for inclusion. All interviews were conducted in-person by Canadian medical students with local interpreters. The survey collected demographic information about the household as well as specific contextual data for those household members who had sustained a burn injury between 2010–2015.

Summary of Results Early results include 246 households surveyed in Eastern Uganda. The mean age of the head of household (HoH) was 46.9 (sd=15.0), with 80% male, education levels being 68% Primary, 15% Secondary, 5% Higher education, and 11% had no formal education. Over 80% of the HoH's were farmers. The median number of residents per household was 8 (range=1 to 50). 79% of households had only thatched roofs; 21% had at least one tin roof.

Of the 2,149 individuals represented, the five-year cumulative incidence of burns was 7 per 1000 (95% CI=5–8). Of the 75 burns that occurred in the sample, 44% were in children age four and under (59% of burns under age 4 were males). 56% of burns occurred during hot/dry season. Contact burns were the most common type (40%), followed by scalds (35%) and flame burns (25%). The majority of burns occurred in the kitchen at home (65%), and primarily affected the limbs of the patients (45% upper limbs and 39% lower limbs). 69% of burns were first treated at home, and 95% of burns discussed in this study resulted in full recovery.

Conclusions The five-year cumulative incidence of burns in this sample was 0.7% between 2010 and 2015. This rate is significantly lower than other studies conducted in neighboring countries.

160 ASSESSMENT OF PERINATAL AND PEDIATRIC HEALTH PRACTICES IN SOLUKHUMBU, NEPAL

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10.1136/jim-d-15-00013.160

Purpose of Study Solukhumbu, Nepal has many barriers to providing optimal health care. The specific impact of these barriers on quality of care and delivery is unknown. As part of a longitudinal project to elevate health care delivery, this study was conducted to identify contributing factors to maternal, neonatal, and pediatric morbidity and mortality and to assess the capacity to provide health care.
Methods Used Using a standardized, validated provider questionnaire, we assessed care quality and capacity at health facilities in Solukhumbu. To determine the communities' experiences, we conducted informal family discussions and utilized a different standardized questionnaire. Reporting is quantitative and qualitative.
Summary of Results 55 households with children <5 years old and 56 households with children >5 years old were surveyed on knowledge and experiences with regard to maternal-newborn and child care.
Antepartum care 55/55 Households attended at least one antenatal care visit. 33/55 of households were counseled on birth preparedness and complications. 37/55 of women report a blood draw at their antenatal visit, and 54/56 women had their BP checked.
Intrapartum care 25/55 deliveries occurred at any health facility, and a skilled provider was present at 26/55 deliveries. 52/55 women experienced a pregnancy danger sign (e.g. prolonged labor, convulsions). Provider records showed that of the 346 deliveries in the past 12 months, there were 15 stillbirths, 2 maternal deaths, and 15 neonatal deaths.
Postpartum care 18/50 women attended a postnatal check within 42 days of delivery. 26/56 newborns were weighed at birth and 38/56 newborns were breastfed within an hour of birth. 18/56 newborns had symptoms associated with suspected neonatal sepsis.
Child care All families (56/56) said their children were fully vaccinated. 17/56 families had a child hospitalized; diarrhea (7/56) and pneumonia (13/56) were common reasons. A child was diagnosed as malnourished in 5/56 families.
Conclusions In Solukhumbu, Nepal more women follow recommendations for obtaining antenatal care than either intrapartum or postpartum care. Rates of stillbirth or newborn death are high. Considerable efforts are needed to improve health care delivery for women and children.

161 DANCING YOUR WEIGHT OFF: AN INTERACTIVE HIGH SCHOOL PEER EDUCATION PROJECT TO ASSESS AND INCREASE ADOLESCENT AWARENESS OF THE IMPORTANCE OF EXERCISE

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10.1136/jim-d-15-00013.161

Purpose of Study Nearly 43% of adolescents in Fresno County are overweight or obese, compared to 38% of adolescents in California overall. Contributing to this are unhealthy dietary choices, portion sizes, & lack of exercise. The US Dep of Health & Human Services recommends at least 60 min of exercise/day, yet<1 in 5 California adolescents meet these recommendations. Peer educators at Fresno High (a large urban high school in Fresno, CA) thus teamed with pediatric residents in the UCSF-Fresno Pediatric Residency Program to 1) design & implement a lunchtime presentation to demonstrate that exercise does not have to be boring to be effective, & 2) conduct a post-demonstration survey to assess how often their fellow students exercise, whether they consider exercise to be fun or onerous, & to assess factors that could potentially stop them from exercising.
Methods Used Age-appropriate popular songs were chosen to encourage dancing and students & residents developed group dance routines which were presented to the lunchtime student body, with the audience invited to participate. Surveys were distributed immediately after the demonstration.
Summary of Results Survey results (n=25: 2 male, 23 female, thus only female data reported) revealed only 22% of females were involved in sports (either at or outside school), & the average student exercised only 2 days per week. Students averaged 5 hrs per day (range 0 to "24/7") on screen time, with 77% of students feeling that screen time contributed to their lack of exercise. Although the majority preferred running, 23% preferred calisthenics, consistent with 1/3 of students believing that fun exercise is not as effective for the body as onerous exercise. Most (86%) felt safe exercising in their neighborhood, & the majority (86%) felt they were more likely to exercise after watching the dance presentation.
Conclusions An interactive dance exercise presentation can be effective in educating adolescents that exercise can be fun, while the finding that screen time can be a significant barrier to exercise in adolescents needs to be explored further with the idea of utilizing technology that could potentially encourage adolescents to exercise more.

162 DON'T LET BUTTE BURN!

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10.1136/jim-d-15-00013.162

Purpose of Study The purpose of this study is to promote sun protective behaviors and skin cancer awareness in Butte preschools and childcare facilities. The annual incidence rate of melanoma in Silver Bow County from 2008–2012 (per 100,000 population per year) was 29.0. In comparison, the incidence rate in Montana was 23.4 and 19.9 in the United States. The rate of melanoma diagnoses is growing nearly seven times faster in Montana than the rest of the country, thus a community and state need exist for sun safety education and skin cancer awareness.
Methods Used A literature review of evidence-based interventions revealed the SunSafe Project which promotes sun protective behaviors in children ages 2–9; outcomes suggest significant improvements in parental knowledge of

sun protection, hat and sunblock policies in schools, and willingness of sunscreen use in children. All SunSafe program resources are available online making utilization of the program feasible. A local public health nurse agreed to serve as a community partner and distribute the materials to preschools and daycares.

Summary of Results Providers will receive SunSafe curriculum recommending a two-day teaching period along with reminder activities on a weekly basis. A lesson plan for each day is included with 34 pages of supplementary games, arts and crafts, songs, and experiments for reinforcement. A list of children's books that relate to sun safety and a completion certificate are also provided. Besides SunSafe resources, the project includes additional materials such as coloring pages from the American Academy of Dermatology, links to sun safety YouTube videos for kids, and a self-written letter to parents that explains the project goals, provides skin cancer statistics, and reminds parents about good sun protective behaviors.

Conclusions Targeting children is key to the intervention as they are receptive and impressionable making them crucial to any type of social change. However, children model parental behaviors so family involvement will be essential. The ease of use for providers is a notable advantage; lesson plans and materials are furnished so preparation time is minimal and flexibility is offered. If the intervention does prove efficacious, the next step may be encouraging elementary schools to implement the curriculum into health classes.

163 ASSESSING THE EFFECTIVENESS OF A CHILD MALNUTRITION TREATMENT CENTER IN RURAL INDIA

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10.1136/jim-d-15-00013.163

Purpose of Study Approximately 47% children under the age of five in India are underweight, and malnutrition is associated with about half of all under-five child deaths. Despite governmental health initiatives, progress on management and prevention of malnutrition has been modest. The purpose of this study is to describe the effectiveness of a health facility based malnutrition management program in rural India.

The objectives of this study are to describe health and weight outcomes of children admitted to a child malnutrition treatment center in Mota Fofalia, Gujarat, India.

Methods Used Data was collected from the records of the Child Malnutrition Treatment Center (CMTC) at a rural hospital in Mota Fofalia, Gujarat, India for children ages 6 months to 5 years admitted between January 2015 and June 2015. The data was recorded by the local nutritionist and abstracted by a team of investigators. The primary outcome measure was the % children who achieved target weight gain (10–15%); secondary outcomes included the proportion of children who completed treatment courses with iron, zinc, and antibiotics and had daily monitoring of vital signs.

Summary of Results A total of 58 children were admitted to the CMTC between January and June 2015; 27/58 (46%) were female; mean age: 22 months (Range: 6 months to 4 years and 7 months, N=53). 77% (45/58) of children completed the 21-day treatment course. The average percent weight gain during treatment was 7.25% (N=54). 3/54 (5.2%) of children achieved the target weight gain. 42/58 (72.4%) received appropriate iron, 42/58 (72.4%) zinc; 47/58 (81.0%) received appropriate antibiotic treatment. None of the children had daily vital signs recorded. Zero deaths were reported.

Conclusions Effectiveness of the CMTC malnutrition treatment program in Mota Fofalia is limited. Further in depth analysis in more facilities and about contributing factors is needed.

164 INCREASING UP-TO-DATE VACCINATION STATUS AMONG CHILDREN ENROLLED IN THE WIC PROGRAM IN ELLENSBURG, WASHINGTON

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10.1136/jim-d-15-00013.164

Purpose of Study This project aims to utilize the Ellensburg WIC office in order to increase the vaccination rates among children in Ellensburg, specifically within a population at high risk for being under-vaccinated.

Methods Used I conducted a community assessment which included a demographic analysis, informant interviews, WIC office shadowing, and a literature analysis. Multiple interventions have been researched to address the issue of under-vaccination via WIC, including assessment and referral, outreach and tracking, and monthly voucher pickup initiatives. The WIC office in Ellensburg currently utilizes the assessment and referral method, where children determined to be not age appropriately immunized are referred to a healthcare provider.

Summary of Results The literature review showed that a monthly voucher pickup program was the most successful intervention for increasing up-to-date vaccination status. Monthly voucher pickup increased the amount of age-appropriately vaccinated children by up to 38% as well as increasing the utilization of preventative health care by WIC families. Based on the knowledge gathered from the literature and the community, a plan was developed that would incorporate the specific needs of the Ellensburg WIC office. This plan, along with a review of the research was presented to the Ellensburg WIC office employees at a staff meeting, and a discussion regarding specific details of implementation followed.

Conclusions Currently the Ellensburg WIC office does not feel they have the resources to implement the monthly voucher pickup initiative, as it would increase appointments and demands on staff in the office. However, employees were enthusiastic about the idea, not only as a method to increase vaccination rates but also to increase utilization of healthcare by families as a whole, and would like to consider implementation if their office grows in the future.

165 SUMMER NUTRITION CHALLENGE: ENCOURAGING HEALTHY EATING BITE BY BITE IN ODESSA, WASHINGTON

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10.1136/jim-d-15-00013.165

Purpose of Study Odessa is a town of less than 1000 people in east-central Washington surrounded by wheat fields and with poor access to high quality food. The grocery store has a paltry selection of foods and this limited access to healthy food is 17% higher in Lincoln County than in Washington State. The county also has higher disease rates of obesity, heart disease, and diabetes, and for all of these, poor nutrition is a contributing factor. Community members state that too many children require free lunch program support. In the summer of 2015 high school students will implement an educational Summer Nutrition Challenge for the 4th and 5th graders that was designed to teach them nutrition concepts through experiential learning.

Methods Used Conversations with community members and the school nurse showed that the town is addressing youth health. The school recently received a PEP grant and the Future Business Leaders of America (FBLA) high school club won a grant for their work raising money to support kids without food. The FBLA students were recruited for this project to run a summer nutrition program, partnering health, leadership, and learning. A literature review revealed studies where elementary students change nutrition habits through experiential learning like trying foods, visiting farms, or even learning the names of new vegetables.

Summary of Results A Summer Nutrition Challenge curriculum was designed, including journals to track challenges and organize check-off days by high school students. Challenges are based off experiential learning techniques such as trying new foods or designing their own snacks. A fieldtrip to a local organic farm was set up as a challenge. FBLA students helped arrange communication with the parents and a grant for prizes that encourage activity such as pool toys. In the classroom, a kickoff presentation was led for the students, including a lively game of nutrition jeopardy.

Conclusions The Summer Nutrition Challenge was a successful design for students to learn about nutrition while encouraging leadership of the high school students in Odessa. Community members were supportive and teachers anticipate good participation. In the future, FBLA students have the opportunity take responsibility and expand the project into a yearly program, open it to more grade levels, and make improvements to the curriculum.

166 THE SHOSHONE BICYCLE HELMET PROJECT: INCREASING HELMET USE THROUGH DISTRIBUTION OF FREE HELMETS AND BILINGUAL EDUCATIONAL MATERIALS

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10.1136/jim-d-15-00013.166

Purpose of Study The Shoshone Bicycle Helmet Project seeks to increase helmet use amongst cyclists in Shoshone, ID, especially children under the age of 15.

Shoshone is a rural community in Lincoln County, ID supported primarily by dairy and farming. Lincoln County households have a lower median income and are more likely to be living below the poverty level compared to state averages. Few children in Shoshone wear helmets, possibly due to the financial obstacle of purchasing a helmet. Annually in the U.S., nearly 1,000 people die from bicycle-crash-related injuries, with head injury being the most common cause of death. During 2014 in Idaho, of all cyclists<35 years old involved in bicycle crashes, only 23% were wearing a helmet.

Methods Used Findings of a literature review of helmet interventions revealed that successful campaigns generally provide low-cost or free helmets and target children<15 years old. The Lincoln County Fair in Shoshone, ID was identified as an ideal time and place to reach children in this age group. Shoshone Family Medical Center staff volunteered their time for the helmet giveaway, and St. Luke's™ Healthcare System (through a grant from Kohl's® department stores) donated 220 bicycle helmets.

Summary of Results All 220 donated bicycle helmets were distributed to children at the Lincoln County Fair on July 23rd, 2015. Shoshone Family Medical Center volunteers were trained in helmet fitting and properly adjusted each child's new helmet. Bilingual educational materials on bicycle safety and helmet use were given to children who received a free helmet and/or their guardian(s), including a trifold drafted exclusively for this project.

Conclusions Community members and clinic staff met this project with enthusiasm, and it is likely that the influx of free helmets and educational materials will increase local helmet use and prevent bicycling-related head injuries. Drawbacks of the project include its limited scope and lack of quantifiable results. One goal of the project going forward is to work with community partners to craft a longer-term partnership where donated helmets are distributed through Shoshone Family Medical Center during well-child checks, thus enhancing the sustainability and efficacy of the Shoshone Bicycle Helmet Project.

167 IMPROVING STROKE AWARENESS IN URBAN AND RURAL PERU THROUGH A HOSPITAL-BASED STROKE PREVENTION CAMPAIGN

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10.1136/jim-d-15-00013.167

Purpose of Study Stroke is the 5th leading cause of death in Peru and cardiovascular risks and diabetes, both major risk factors of stroke, remain the 2nd greatest burden of disease. Systematic and economic barriers to treatment of stroke and risk factors highlight the need for appropriate stroke prevention campaigns. Previous prevention campaigns have done little to improve immediacy of care-seeking, as 75% of patients seek medical attention at least 24 hrs after onset of symptoms. This shows a need for more sustainable and readily available patient education

literature that is adaptable to population and region. Studies have shown the efficacy of educational brochures in hospitals as a means of achieving these prevention goals. The purpose of this project was to increase stroke knowledge in Lima and Tumbes, Peru through the implementation of sustainable hospital and clinic-based stroke and risk factor prevention campaigns centered on educational brochures.

Methods Used Focus groups and one-on-one interviews with stroke patients and their families at the Instituto Nacional de Ciencias Neurologicas (INCN) in Lima and the Instituto de Salud Global (UPCH) in Tumbes were used to help create brochures specific to each patient population. Brochures were distributed to patients at clinic visits and made available in hospital waiting rooms. Suggestions for edits were asked from each patient and used for future edits.

Summary of Results 180 brochures were distributed to patients and families at the INCN and close to 48 clinic patients at the UPCH. Edit and distribution schedules were established with the communications department at the INCN, UPCH, and Grupo Stroke (a Lima-based community health group) to insure future distribution.

Conclusions The stroke prevention campaign used brochures to increase knowledge and awareness of stroke risk factors and warning signs at the INCN and UPCH and improve care-seeking times. This campaign and the continued distribution of brochures will be made possible by communications teams and medical staff in Lima and Tumbes and the members of Grupo Stroke. Plans were also made with INCN-affiliated hospitals and clinics to distribute these pamphlets by the end of the year and for Grupo Stroke to use these materials for future stroke awareness events, such as a Walk/Run in October.

168 "*EDúCATE Y ACTúA*" DISASTER RESPONSE COMMUNICATION STRATEGY FOR GRANT COUNTY

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10.1136/jim-d-15-00013.168

Purpose of Study To develop an Emergency Disaster Response communication strategy and supporting materials for Spanish speakers in the County.

Methods Used An interview with a local community health worker exposed the vulnerability of Spanish-speaking farm workers in Washington's central valley during times of disaster emergency. Research of the state of affairs in Moses Lake confirmed the absence of outreach in Spanish with respect to evacuation warning system. The Sheriff's Public Information Officer (PIO) shared the emergency response materials (the "Protocol") to be translated, and the PIO agreed to the communication strategy.

Summary of Results Using the resiliency model (which emphasizes collaboration among diverse community organizations), the communication strategy included the following:

- Translated the Protocol from English to Spanish and disseminated it among community leaders.
- Created a flyer that was culturally, language and literacy appropriate and made it available to community organizations.
- Identified seven high-yield venues to distribute the flyer to Spanish-speakers, including the local Spanish radio stations.
- Presented the communication strategy to the Sheriff at the Sheriff Department's Town Hall Meeting on Thursday, July 30, 2015.
- Presented the flyer to Spanish-speaking farm workers at a health fair in Quincy, on July 29, 2015.

Conclusions Grant County Sheriff's Department has adopted a Protocol which was issued several times during the month of July. The Sheriff did not invest in translating the Protocol into Spanish nor issue Spanish-language evacuation notices. While no specific statistics exists on the Spanish-speaking population, a correlation can be made between the percentages of (a) 39.4% Latinos in the county and (b) the 33.2% non-English speakers. These numbers translate into an urgent need for language appropriate disaster response.

The PIO understood the urgency and heightened vulnerability of the Spanish-speaking community. Moving forward, organizations and community leaders who were contacted will continue to make the flyer widely available. The PIO will create a Facebook page in Spanish. More needs to be done in disaster emergency preparedness which focuses on instructing health workers and community leaders on the specifics of the existing emergency disaster protocol so that they can, in turn, educate the Spanish-speaking community.

Poster Session
Endocrinology and Metabolism
6:00 PM
Thursday, January 28, 2016

169 PARATHYROID CARCINOMA A SMOLDERING DISEASE: CASE REPORTS

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10.1136/jim-d-15-00013.169

Introduction Parathyroid carcinoma (PTC) is a rare cause of hyperparathyroidism. PTC patients are more likely to have symptoms, a neck mass, bone and kidney disease, marked hypercalcemia, and very high serum parathyroid hormone (PTH) concentrations. Mortality due to functional PTC is usually secondary to intractable hypercalcemia leading to progressive end-organ damage.[1] We present two cases of this rare cause of hyperparathyroidism. Additionally, a review of the literature regarding treatment and management is presented.

Case Reports A 64-year-old female with a past medical history of HTN who presented with hypercalcemia presumed to be due to primary hyperparathyroidism (PHPT). Calcium increased to13.8 mg/dl (Normal 8.2–10.4); ionized calcium (iCa) 1.87 mmol/L (1.04–1.36); and PTH intact (iPTH) 323 pg/ml (Normal 12–72). She underwent a parathyroidectomy. Pathology demonstrated PTC. Postoperatively, calcium and iPTH have been in the normal range at 9.3 mg/dl and 190 pg/ml respectively.

An 81-year-old female with a history of parathyroid carcinoma diagnosed in 2012 underwent resections on 3 occasions,

lastly in August 2014. Hypercalcemia was refractory to zoledronic acid treatment. The patient was then started on cinacalcet 60 milligrams twice daily and is doing well.

Discussion PTC accounts for less than 1% of PHPT patients in the United States. En-bloc resection of the carcinoma and the adjacent structures in the neck remains the gold standard of surgical treatment. Incomplete resection results in a local recurrence rate of 50% and a disease related mortality rate of 46%.[2]

PTCs are more likely to have a neck mass, bone and kidney disease, marked hypercalcemia, and very high serum PTH levels. Classic pathologic features of a trabecular pattern, mitotic figures, thick fibrous bands, capsular and vascular invasion, are highly suggestive of PTC. Definitive diagnosis depends on the presence of invasion into surrounding tissues or distant metastasis.[1]

Treatments with radiotherapy and chemotherapy have a very limited role.[2] Hypercalcemia is the principal cause of morbidity and mortality from parathyroid carcinoma.[1] Denosumab may have a role for treatment of hyperparathyroid-related hypercalcemia caused by PTC.[3]

170 PRIMARY CARE PROVIDERS' PERCEPTIONS OF LIFESTYLE MODIFICATION AND MANAGEMENT FOR OBESITY AND PREDIABETES

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10.1136/jim-d-15-00013.170

Purpose of Study Obesity and prediabetes are growing public heath concerns. Studies have shown that when primary care providers (PCPs) emphasize lifestyle change, it improves patient knowledge and motivation for weight loss. This can translate into improved weight outcomes, which is critical for both obesity and diabetes prevention. Our primary goal was to evaluate PCP's attitudes and perceptions regarding obesity and prediabetes management in primary care.

Methods Used Interviews with PCPs from four outpatient VA Greater Los Angeles clinics were transcribed and qualitatively analyzed using CFIR and RE-AIM constructs.

Summary of Results We interviewed 16 PCPs and our qualitative analysis identified 4 main themes: 1) PCPs recognize the importance of lifestyle change discussion, 2) facilitators include understanding the patient's current behaviors and risks and sharing objective measures with the patient, 3) but providers perceive significant barriers including the lack of time, competing demands (i.e. other medical issues), and lack of patient motivation, making 4) routine referrals to lifestyle change resources the preferred management.

Conclusions Despite understanding the importance of lifestyle change discussions for obesity and prediabetes, PCPs perceive significant barriers. Thus, referrals to other specialists and lifestyle programs have become a mainstay of management. Although there is evidence to support group based lifestyle interventions, PCPs favor individualized coaching, which has implications for cost and sustainability.

171 ROLE OF TETRAPEPTIDE SDKP IN SKIN CRYOSURGERY HEALING

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10.1136/jim-d-15-00013.171

Purpose of Study Cryosurgery is commonly used to treat various dermatological skin lesions. The purpose of our study was to investigate the role of SDKP in the healing process following cryoinjury. Previous studies have shown the tetrapeptide SDKP is involved in mechanisms controlling fibrosis in several organs. SDKP is inactivated by angiotensin converting enzyme (ACE). ACE has two catalytic sites; the N-domain site, is responsible for inactivating SDKP. N-domain inactivated (N-KO) mice have the N-domain genetically modified and enzymatically impaired, resulting in SDKP accumulation. N-KO mice provide a model to study potential SDKP therapeutic properties *in vivo*. Previous studies in N-KO mice show a reduction of lung fibrosis in response to bleomycin instillation when compared with wildtype (WT) mice. This project seeks to analyze the effects of increased SDKP concentration on fibrosis and healing after skin cryoinjury. In this study, N-KO and WT mice were injured using liquid-nitrogen-cooled probe (Cry-Ac TrackerCam® Brymill) applied on the dorsal skin. Wounds were analyzed for morphological differences and durations in wound healing. Our hypothesis is that SDKP could ameliorate the wound healing process and possibly reduce inflammation and scar formation.

Methods Used WT and N-KO mice were anesthetized with ketamine/xylazine. Dorsal skin was shaved and injured using 6mm or 10mm cryoprobes for various durations (5 to 25 sec). Wound healing was analyzed in terms of size and development of necrotic tissue until wound closure. Wound surface area was measured by ImageJ using a set scale and results were analyzed using GraphPad Prism. In another group of mice, after 6mm wound closure, mice were sacrificed for histological tissue analysis of the injured tissue.

Summary of Results Preliminary experiments were designed to optimize the duration of probe application. We determined 20 seconds produced a consistent freezing of the skin without significant damage to underlying tissues. Mice developed necrotic tissue three days post injury, but do not show a significant difference in wound healing rate between WT and N-KO groups.

Conclusions Preliminary results indicates a possible trend of wound size reduction in N-KO mice compared to WT.

172 PILOT STUDY: END OF LIFE CONVERSATIONS; A PATIENT PERSPECTIVE

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10.1136/jim-d-15-00013.172

Purpose of Study There is a plethora research on the challenges of physician-patient communication at the end of life. The literature, however, predominately considers the physician and the inherent difficulties in discussing death

and dying. The patient perception is largely, if not entirely, missing from the canon. Consequently, our research seeks to understand the delicate intricacies of end-of-life discussions, from the patient perspective. Further, given Oregon's unique governance on "Death with Dignity," we seek to understand when and if education is being provided to eligible patients.

Methods Used We developed a standardized survey tool to elicit qualitative information from patients regarding their initial end of life discussion with providers. The tool is designed for use during personal interviews with patients being treated within Samaritan Health Services (SHS) Palliative Care Program. All patients within this pool, who meet the specific inclusion criteria, will be given the opportunity to share their experiences. All patients and patient data will remain anonymous. Interviews are audio-recorded and then transcribed for data analysis. Biostatisticians at Oregon State University are analyzing the data using NVivo software to look for trends and associations in the data.

Summary of Results To date, 347 candidates meet the criteria of being a patient within the SHS Palliative Care Program. We've contacted 249 patients, 200 of whom either could not or world not participate, 34 could not be contacted and 104 remain to be contacted. Of the 249 contacted, nine subjects agreed to the interview. Five interviews have been conducted and we are scheduled to complete the other four.

Conclusions Data analysis from the interviews demonstrates two overarching conclusions. First, three out of five interview subjects initiated their own end of life conversation. Second, none of the interview subjects engaged in a conversation on the topic of "Death of Dignity" and only one of them had been provided with any information on the subject at all.

Poster Session
Genetics
6:00 PM
Thursday, January 28, 2016

173 BEHAVIORAL PHENOTYPE IN CHILDREN WITH PRADER-WILLI SYNDROME

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10.1136/jim-d-15-00013.173

Purpose of Study Prader-Willi syndrome (PWS) is a disorder is classically associated with hyperphagia and obesity, and behavioral problems are one of the most common parental concern. Much of the phenotype in PWS is age-related. Only a few genotype-phenotype correlations have been suggested in PWS. Previous studies have suggested that the severity of behavior problems differs based on genotype [e.g. uniparental disomy (UPD) with milder behavior problems]. The age of the individuals involved in these studies are mostly adolescents and young adults, with 12 years being the youngest. Our objective was to characterize the behavioral profile of children with PWS, targeting the early childhood period, and compare this profile to genetic subtype.

Methods Used A retrospective cohort study of individuals with a molecular diagnosis of PWS ≤ 18 years from a multidisciplinary clinic from 2007–2015. Demographic, clinical and molecular data were compiled and compared based on genetic subtype.

Summary of Results A total of 39 individuals with PWS reviewed [mean age 8.8 yrs (range 1–18); male=19, female=20]. Genetic subtype (deletion=21; UPD=18). Behavioral, cognitive and psychiatric problems were frequent in children with PWS as a whole. Rate of conduct disorders, communications disorders, and PDD was fairly similar between UPD and deletion groups. There was a trend towards an increase in intellectual disability and a decrease in obsessive compulsive disorder (OCD) in the UPD group.

Conclusions These data further confirm a significant behavioral, cognitive, and psychiatric phenotype in the PWS pediatric population. Future studies utilizing specific behavioral scales controlling for age will be important to further clarify the behavioral phenotype in children with PWS, and help in clarifying differences in genotype and potential role of modifiers.

174 PRADER-WILLI SYNDROME DUE TO AN UNBALANCED DE NOVO TRANSLOCATION T(15;19)(Q12;P13.3)

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10.1136/jim-d-15-00013.174

Purpose of Study Prader-Willi syndrome (PWS) is a complex, multisystem genetic disorder characterized by multiple endocrine, neurological and behavioral abnormalities. Structural rearrangements of chromosome 15 have been reported in about 5% of the patients with typical or atypical PWS phenotype. Here, we report a first case of PWS resulting from an unbalanced de-novo reciprocal translocation between the long arm of chromosome 15 and the short arm of chromosome 19 resulting in monosomy for 15q11.1–15q12 and monosomy for 19p13.3–19pter (karyotype 45, XY, −15, der(19)t(15;19)(q12;p13.3)). We compared the phenotype of our patient with typical PWS and case reports with 19p13.3 deletion.

Methods Used Clinical Case Report.

Summary of Results Our patient had some features of typical PWS patients including hypotonia, development delay, hyperphagia, skin picking, lower pain threshold, sleep apnea, gastroesophageal reflux, bilateral 5th finger clinodactyly, and distinctive behavioral characteristics with attention deficit hyperactivity disorder, temper tantrums, compulsive behaviors, anxiety and gastroparesis. Unlike classical PWS he was not obese and did not have the typical craniofacial features. MRI of the brain was unremarkable except for a small pituitary. He had macrocephaly, unusual seizure activities from 1 to 3 years of age and marked cognitive delay similar to the three cases reported with 19p13.3 deletion. However, cutis aplasia, skin cellulitis, blood clot, Peutz-Jeghers, edema, atrial septal defect previously reported with 19p13.3 deletion were absent in our patient.

Conclusions We report a unique case with some common features of PWS including hypotonia, developmental delay, intellectual disability, strabismus, and speech impairment, the atypical features including lean habitus, more marked cognitive delays and seizures being attributable to the 19p13.3 del in our patient.

175 IS INCIDENTAL FINDING THE BEST TERM? A STUDY OF PATIENTS' PERSPECTIVES

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Purpose of Study The term Incidental Finding is widely used in medical genetics to describe pathogenic variants unrelated to the disease targeted for diagnostic testing. However, there is debate within the genetics community about whether this is the best-fitting term. We asked clinical genetics patients for their perspective on what are the best and worst terms.

Methods Used Paper and electronic surveys were distributed to patients (n=88), asking them to rank four terms according to how well each describes the concept of incidental findings: Incidental Findings, Secondary Findings, Additional Findings, and Ancillary Findings. They also rated how strongly they felt there are worse or better choices and had the option to suggest a different term. Terms were presented in a randomized order in the electronic survey and a consistent order in the paper survey.

Summary of Results Rankings were similar between paper and electronic results. Additional Findings make up 59% of first choice rankings, followed by Secondary Findings (20%), Incidental Findings, and Ancillary Findings respectively. Ancillary findings make up 44% of fourth choice rankings, followed by Incidental Findings (38%), Additional Findings and Secondary Findings respectively. 28% of participants said it does not matter to them which terminology is used and 24% said they feel some terms are better. 14 terms were suggested.

Conclusions Despite widespread use of Incidental Findings, patients preferred Additional Findings and Secondary Findings over Incidental Findings. Two patients commented that Incidental Findings misleadingly suggests the findings are unimportant. These results indicate there may be a discrepancy between how medical genetics professionals communicate about incidental findings and what patients perceive. Also, "additional" and "secondary" are on the Oxford 3000, a list of the "most important words to learn in English" based on frequency in texts and/or high familiarity to English users, which may indicate that patients prefer using commonly used words to describe their genetic findings.

176 SCOLIOSIS IN A PRADER-WILLI SYNDROME CLINIC

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10.1136/jim-d-15-00013.176

Purpose of Study It has long been recognized that scoliosis is seen in about 35% of individuals with Prader-Willi syndrome. Growth hormone therapy has not been shown to influence the development or evolution of scoliosis in PWS. Genetic modifiers have yet to be identified. Since the initiation of a comprehensive care PWS Clinic, we have identified a cohort of patients who have progressive scoliosis. Our hypothesis is that individuals with PWS who develop scoliosis have deleterious sequence variants in modifier genes, and to that end we have extensively phenotyped the cohort of scoliosis patients at the U of Utah PWS Clinic.

Methods Used The Clinic started in 2008 and it follows 53 individuals with PWS; 24 children less than 10 years old and 29 individuals 10 years and older. We performed a systematic retrospective chart review including Clinic summaries, orthopedic consultations, operative notes, and radiologic review to reconstruct the natural history of scoliosis in this PWS Clinic cohort.

Summary of Results Six of 24 children (25%) less than 10 years old have either scoliosis or kyphosis greater than 20 degrees. Fourteen of 29 individuals (48%) 10 years or older have scoliosis or kyphosis greater than 20 degrees; 11 had spine fusion ranging from 7 to 24 years of age at the time of surgery. Four individuals progressed rapidly over a 2–3 year period without dystrophic bone changes.

Conclusions We were unable to identify specific physiologic associations, disease manifestations, or PWS-related molecular etiologies that predict either development of scoliosis or progression. Physical exam using the Adams forward bend test was not helpful in most of the children. Most individuals were asymptomatic. For those undergoing spinal fusion, close monitoring for stress response and pain management were issues. Genetic modifiers for PWS-related scoliosis have yet to be identified.

Poster Session
Health Care Research
6:00 PM
Thursday, January 28, 2016

177 DO ASK, DO TELL: AN INTERACTIVE WEB-BASED ASSESSMENT OF PHYSICIAN WELLNESS

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10.1136/jim-d-15-00013.177

Purpose of Study Physician burnout and reluctance to seek help are risk factors for compromised personal wellness, delivering quality patient care and poor organizational performance indicators. We hypothesize that physicians at BC Children's Hospital (BCCH) are at high risk of burnout due to a combination of increased clinical complexity and demand for patient care, the construction of a new hospital and the implementation of an electronic health record. This study aims to deliver an interactive wellness self-

assessment that will generate: (1) immediate individual and peer comparison feedback; (2) access to wellness resources; (3) input towards implementation of wellness initiatives; and, (4) a current organizational profile of physician well-being.

Methods Used The Maslach Burnout Inventory (MBI) and the Connor-Davidson Resilience Scale (CD-RISC 25) will be administered through a confidential electronic survey to all medical residents, fellows and active staff at BCCH in the Fall of 2015. The survey will provide a 'current state' individual and organizational physician wellness profile. A website has been developed providing access to current wellness initiatives, related literature, and coping strategies.

Summary of Results Our interdisciplinary Physician Wellness Team composed of physicians, surgeons, psychologists, and medical students developed the interactive, confidential tool to provide immediate individual and peer comparison feedback related to burnout and resilience. We anticipate respondents to be at or above national benchmark levels due to simultaneous organizational, structural and service delivery changes. Qualitative data will capture physician resiliency strategies and ideas for organizational wellness initiatives.

Conclusions Physician wellness will be directly addressed at our institution through the use of an interactive survey that will deliver confidential self-assessments, provide data for institutional improvement and serve to increase awareness of both burnout and resiliency factors that can impact physician's health and patient care.

178 STUDENTS AS FUTURE EDUCATIONAL LEADERS IN THE DEVELOPMENT OF LEARNING RESOURCES: AN UNDERGRADUATE SURGICAL CURRICULUM INITIATIVE

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10.1136/jim-d-15-00013.178

Purpose of Study Can the current didactic teaching model be improved through supportive educational tools beyond the lecture theatre? Instead of presenting material one-dimensionally, the 'Cutting Classes' project was initiated to investigate alternative teaching methodologies to provide content for 3rd-year surgical clerks. The purpose was to have students work with faculty, educational facilitators, and peers to develop foundational competency-based multimodal tools.

Methods Used Two second year medical students focused on a set of core surgical competencies identified by the Director of Undergraduate Surgical Education that required additional emphasis and resources. The students conducted a focus group with 4 current clerks, and met with faculty and subject matter experts to determine the content and modalities that would lead to a high-value and engaging module.

Summary of Results Feedback from third year clerks included the need for flexible learning through a variety of modalities, a focus on the approach to diagnosis and treatment rather than disease specific details, and priming clinical lectures with appropriate physiology and basic science. Faculty emphasized teaching concise concepts, clinical reasoning, and greater but effective use of visuals. The medical students used this qualitative data to develop practical and useable educational resources in the form of video podcasts and reference sheets for surgical objectives on Chest Trauma.

Conclusions Engaging the key stakeholders in the learning process prior to developing curricular tools ensures high value and usability for clerks. Additionally, involving medical students as educational leaders in the development of such tools allows them to not only shape their own education, but to enhance the learning of their future colleagues.

179 STAYING ALIVE: ACTIVE SHOOTER SIMULATION IN THE OPERATING ROOM

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10.1136/jim-d-15-00013.179

Purpose of Study Active Shooter (AS) or targeted violence (TV) is a type of gun violence that is increasing in America over the past 14 years. Hospital based AS/TV increased 85%. This increase forced hospitals to implement AS education. Traditional AS education involves Power Points or webinars. Loma Linda (LL) University uses medical simulation (MS) as a teaching tool for AS education. Active shooter simulations have been preformed in clinics, ERs, and wards never in an operating room (OR). The Department of Anesthesiology the Redlands Police Dept. (RPD) and Medical Simulation Center (MSC) conducted the first AS MS in an OR.

Methods Used The AS MS was conducted at Loma Linda Surgical Hospital. The MS used manikins, actors, and the RPD to evaluate MS as an educational tool for AS education in the OR. The MS involved 2 educational elements 1) physician AS response and 2) patient care during a AS. Pre-simulation questionnaires where used to evaluate knowledge of AS, anticipated response, and perceived ethical responsibilities. Post-simulation questionnaires evaluated simulation effectiveness, educational effectiveness, and personal response.

Summary of Results A total of 11 Anesthesia Residents participated in the MS. The pre simulation-questionnaire identified that none had participated in previous AS education, but 82% felt this training is essential. Prior to the simulation 64% felt they would protect patients, 91% felt they had an ethical obligation, and only 45% felt that they could abandon a patient.

From the post simulation questionnaire 90% felt fear/anxiety, that the MS was realistic and informative, and essential that it occur in an OR. 100% felt the MS was essential for an adequate facility response with 90% feeling better prepared to act after the MS. 89% of the group preferred AS simulation to other educational methods and 90% recommended that all OR staff should experience AS simulation.

Conclusions Medical simulation is the preferred teaching platform for AS education. Active shooter simulations can be effectively conducted in an operating room.

180 ATTITUDES OF GLOBAL HEALTH PROFESSIONAL FACULTY TO SOCIAL MEDIA AS A TEACHING TOOL

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10.1136/jim-d-15-00013.180

Purpose of Study Use of social media (SM) in health education has witnessed a revolution within the past decade. Students have already adopted SM informally to share information and supplement their lecture-based learning. Although studies show comparable efficacy and improved engagement, broad-based adoption has been slow and the data of barriers to uptake have not been well documented. The purpose of this study was to assess attitudes towards SM in education, examine differences between faculty who do and do not use SM in teaching practice, and determine factors to increase uptake of SM.

Methods Used A cross-sectional online survey was disseminated to the interprofessional health educators at 8 global institutions. Respondents were categorized by frequency of SM use in teaching; 'users' sometimes, often or always used SM, while 'non-users' never or rarely used SM.

Summary of Results 270 health educators (53% users; 47% non-users) were included in the survey. Users and non-users demonstrated significant differences on perceived barriers and potential benefits to use of SM. Users were more motivated by learner satisfaction and technology compatibility, while non-users reported the need for departmental and skill development support. Both shared concerns of professionalism and lack of evidence showing enhanced learning. In the future, non-users report potential SM use to share content, while users report interest in generating original content.

Conclusions Our findings suggest the majority of educators are open-minded to incorporating SM into their teaching practice; however 'users' and 'non-users' significantly differ on their attitudes on the barriers and factors influencing their use. Identification of these differences and areas of overlap present opportunities to determine a strategy to increase uptake.

181 THE OPTIMAL ATTRIBUTES OF A TRAUMA TEAM LEADER: EVIDENCE FROM A DISCRETE CHOICE EXPERIMENT

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10.1136/jim-d-15-00013.181

Purpose of Study Trauma hospitals rely on multidisciplinary healthcare teams to successfully manage acute patient admissions. The leader of a trauma team is tasked with ensuring the team functions effectively to produce optimal patient outcomes. Although an effective trauma team leader is often thought to be self-evident–there is little formal literature identifying the leadership characteristics and attributes associated with optimal trauma team performance. The purpose of this study was to elicit the trauma team leader traits and characteristics deemed of greatest utility by members of the trauma team.

Methods Used Semi-structured interviews with trauma team members in British Columbia, Canada were conducted to develop attributes and attribute levels for a discrete choice experiment (DCE) survey. The DCE survey contained 10 choice-sets with varying attributes based on a D-optimal statistical design. Multinomial logit modeling was used to determine the relative utility of each attribute included in the experiment.

Summary of Results Among the 64 respondents, 74% were female, 36% were physicians, and 36% had been members of the trauma team for more than 10 years. The attributes most strongly preferred by the respondents were collaborative, communication, and decisiveness. The attribute of least utility was experience. The specific leadership qualities that provided the most utility to the trauma team were "actively involves input for team" (0.70; SE: 0.11) and "concise communications, at time closed-loop" (0.52; SE: 0.09). "Hesitant and unclear communication" (–0.88; SE: 0.09) and "often indecisive" (–0.68; SE: 0.10) were deemed most detrimental to the team's function.

Conclusions The findings of this study present the leadership characteristics preferred by trauma team members. Long-term strategic development and mentorship could be refined to foster these attributes deemed of greatest utility for optimal trauma team performance.

182 PATTERNS OF BURN CARE AT COMMUNITY HEALTH CARE CENTERS IN UGANDA

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10.1136/jim-d-15-00013.182

Purpose of Study It is estimated that 90–95% of burns related deaths occur in low- and middle-income countries. Little is known about current patterns of presentation and the availability of resources to manage this substantial burden. The main objective of this study was to determine the patterns of burn care at community health centers in Uganda, specifically investigating the frequency of presentation, treatment methods, and patient outcomes. The secondary objective was to identify barriers to receiving burn care.

Methods Used Semi-structured interviews were conducted with healthcare workers (HCWs) involved in burn care at Health Centers II, III, IV, and private clinics in districts around Soroti, Uganda, and at Soroti Regional Referral Hospital (SRRH). A descriptive qualitative case study was designed, and unique information was extracted using

thematic analysis. A retrospective review of the records of patients presenting with burn injuries to participating facilities in the six-months prior to data collection was performed to gain insight into the patterns of burn injuries and socio-demographic information of burn patients.

Summary of Results Thematic analysis of the HCWs interviews (n=14) produced over one hundred codes, eleven sub-themes, and four overarching themes. These four themes included: 1) access to care; 2) treatment capabilities; 3) resource constraints; and 4) patient patterns. Of the 79 patients with recorded burn injuries in the six-months prior to data collection, 69.6% presented direct to the regional hospital without referral. Burn patients presenting directly to SRRH travelled a mean distance of 9.7 kilometers (95% CI: 2.9–16.5) further than those who initially presented to lower level facilities.

Conclusions A shortage of resources at community health centers in Uganda inhibits the ability of these centers to effectively treat many types of burns. The findings suggest that burn patients are aware of these resource limitations in lower level health facilities and self-refer direct to the regional hospital.

183 SOCIAL MEDIA USE IN EMERGENCY ULTRASOUND FELLOWSHIP EDUCATION

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10.1136/jim-d-15-00013.183

Purpose of Study Social media has been gaining traction among learners and educators for its ability to stimulate discussion, increase participation and promote knowledge sharing. Despite the growing research around the benefits of social media in education, there is little evidence of how it is being incorporated into Emergency Ultrasound (EUS) fellowships. The purpose of this study is to better understand the use of social media by EUS programs.

Methods Used This was a cross-sectional study. An online questionnaire was electronically sent to all EUS fellowship directors across the country. The survey consisted of questions regarding current practice patterns, policies, and perceptions regarding the use of social media in EUS fellowship programs.

Summary of Results A total of ninety ultrasound fellowship programs were identified for inclusion into our study. To date, 34 participants have completed the survey, representing a 38% response rate. Thirty-five percent (95% CI, 19% –51%) of responding fellowship programs have an official social media outlet. Only 18% (95% CI, 5% – 31%) have a dedicated person in charge of updating and managing the program's social medias outlets. None of the programs have dedicated funding or resources to support social media use. Sixty-five percent of the educators felt that the biggest barrier to the use of social media for fellowship education is the lack of protected time. Despite barriers, 67% (95% CI, 51% – 83%) of responders expressed interest in collaborating with other programs to explore social media use. The top two social media outlets used by programs are Twitter and YouTube. Thirty-five percent (95% CI, 19% – 51%) of programs create or post new ultrasound content at least once per month. Sixty-seven percent (95% CI, 51% – 83%) spend less than one hour per day involved with ultrasound related social media. Eighty-eight percent (95% CI, 77% – 99%) of responders felt that social media does have the potential to impact patient care.

Conclusions The results of this study show that there is perceived value in utilizing social media in EUS education; however, certain challenges need to be evaluated.

184 EVALUATION OF MATERNAL AND INFANT PRACTICES AND ILLNESS IN RURAL NEPAL

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10.1136/jim-d-15-00013.184

Purpose of Study Although Nepal has introduced several programs to improve pediatric and newborn health, implementation of programs and adherence to guidelines is highly variable. The objectives of this study were to determine adherence to maternal-newborn care guidelines, to assess care quality for common pediatric conditions, and to identify barriers to providing optimal care.

Methods Used A population-based observational study conducted in three randomly selected areas of Chitwan District, Nepal. Health posts were randomly selected and records were reviewed to determine the most common pediatric illnesses, practices and treatment protocols. Households were randomly selected to determine practices, utilization of, and barriers to pediatric healthcare within the community. Interpretation for surveys was provided by locals.

Summary of Results 22 households and 3 health posts were visited. Health posts averaged 92 pediatric (i.e. less than five years-old) encounters per month and referred 8% (7/92) to the district hospital. Adherence to prenatal care guidelines was variable: 77% (17/22) of pregnant women had at least 4 visits but only 27% (6/22) were screened for anemia and infection. Care during a delivery also varied: 72% (16/22) were attended by a trained provider but only 45% (10/22) occurred at a health facility. Families living further from hospitals were less likely to deliver at a facility. Pediatric care also varied despite guidelines. 16/22 (72%) of families had a child diagnosed with diarrhea in the past 12 months. All received ORS while only 45% (7/16) received supplemental zinc. Every family identified child malnutrition as a top concern. 50% (11/22) of families had at least one child diagnosed, yet only 4% (1/22) received any treatment. Families noted lack of funds, transportation, and facilities with knowledgeable staff as barriers to seeking care. Providers identified lack of equipment, nutritional resources, and available staff as reasons for suboptimal care.

Conclusions Inconsistencies in perinatal and pediatric care are widespread in Chitwan District, Nepal. Barriers in both care-seeking behavior and health care delivery factor into this. To improve adherence to national guidelines and increase overall health status, significant efforts are required in Chitwan District.

Poster Session
Hematology and Oncology
6:00 PM
Thursday, January 28, 2016

185 THE EFFECT OF DOT1L INHIBITION ON RNA POLYMERASE II PAUSING

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10.1136/jim-d-15-00013.185

Purpose of Study Re-arrangements of the mixed lineage leukemia gene (MLL) are found in aggressive infant leukemias and adult acute myeloid leukemias. Rearrangements of MLL result in recruitment of Dot1l, a H3K79 methyltransferase, to its target genes. Small molecule inhibitors of Dot1l are in clinical development after they were shown to inhibit leukemogenesis. However, the mechanism of Dot1l activity in the leukemogenesis of MLL-rearranged leukemias is not fully understood.

Interestingly, Mll-fusion proteins are also known to recruit proteins that regulate RNA Polymerase II (RNA Pol II) pausing on target genes. Dot1l may be recruited with these protein complexes and contribute to increased target gene expression associated with MLL-rearranged leukemias. This study aims to determine the effect of Dot1l inhibition on RNA Pol II pausing in these cancers.

Methods Used Human leukemia cells lines with and without MLL-rearrangements, Jurkat, Loucy, MV4;11, and Molm13, were cultured and prepared for drug treatment. In order to determine the effect of Dot1l inhibition, the cell lines were treated with Dot1l inhibitor for 6 days and control cells were treated with the same concentration of the drug vehicle, DMSO. The control and drug treated cell lines were then subjected to RNA Polymerase II ChIP-seq, to study the effect of Dot1l inhibition on Pol II pausing genome-wide. The ChIP-seq quality was tested with a GAPDH qPCR and sequenced on an Illumina next-generation platform.

Summary of Results The Jurkat cell line, a non-MLL rearranged leukemia, produced the expected RNA Pol II ChIP-seq profile. There is a high density of reads just downstream of the transcription start site (TSS) and a smaller increase in read density towards the transcription end site (TES). In the Jurkat cells treated with Dot1l inhibitor, there appears to be slightly more RNA Pol II reads in the body of the gene and less Pol II density near the TES.

Conclusions Inhibition of Dot1l produced some differences in the Pol II profile, especially at highly expressed genes. These results suggest that Dot1l may play a role in the initiation of RNA Pol II pausing. The profiles of RNA Pol II in our MLL-rearranged cell lines are being analyzed in order to further clarify these results, which may provide insight into the mechanism of Dot1l inhibitors as chemotherapeutics.

186 EFFECT OF SURVIVIN AND CANCER CELL-DERIVED EXOSOMES ON NATURAL KILLER CELL CYTOTOXICITY

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10.1136/jim-d-15-00013.186

Purpose of Study Natural killer (NK) cells have inherent abilities to kill target cells and are among the first responders in recognizing and destroying infected or transformed cells. However, many types of cancers inhibit the surveillance and cytotoxic abilities of NK cells by releasing exosomes, vesicles that can modulate tumor microenvironment and intercellular communication for the purpose of enhancing tumor malignancy. Recently, cancer cell exosomes have been found to contain survivin, an inhibitor of apoptosis (IAP) protein that prevents cell death and decreases immune response of lymphocytes. The purpose of this study is to explore the effect of survivin and cancer cell-derived exosomes, which contain survivin, on the immune functions of NK cells. The hypothesis is that survivin and exosomes will decrease NK cell functions by suppressing NK cell release of cytokines and cytotoxic granules.

Methods Used NK cells were obtained from five healthy donors' blood samples. The experimental design contains six groups. To these NK cells, the treatments include applying pure survivin protein, two different concentrations of exosomes from two lymphoma cell lines, DLCL2 and FSCCL, and an untreated group. RNA was isolated from NK cell samples, synthesized into cDNA and specific targets amplified with polymerase chain reaction (PCR) using primers for cytokines and cytotoxic granules. PCR products were imaged and analyzed with ImageJ as visual bands on a 1% agarose gel. Intracellular flow cytometry was used to determine protein expression.

Summary of Results Gel results show some instances of decrease in band intensities of NK cell cytotoxic granules and cytokines in some donors treated with pure survivin and exosomes, but no trend could be drawn. However, flow cytometry results indicate an overall decrease in expression for all target cytokines (TNFα & IFNγ) and cytotoxic granules (perforin & granzyme) when treated with survivin only.

Conclusions The experiment is in the early stage but a possible trend was observed in which pure survivin treatment could potentially decrease NK cell release of cytokines and cytotoxic granules. However, the results were inconsistent due to donor variability. Therefore, more samples are needed for further studies.

187 AUTOIMMUNE HEMOLYTIC ANEMIA AND THE SEQUELA OF IGA LINEAR DERMATITIS

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10.1136/jim-d-15-00013.187

Background Linear immunoglobulin A (IgA) dermatosis is an autoimmune vesiculobullous disease that may be

idiopathic or drug-induced. The clinical presentation is heterogeneous and appears similar to other blistering diseases, such as bullous pemphigoid, and dermatitis herpetiformis. Histopathologically, it is characterized by the linear deposition of IgA at the basement membrane zone. Antibody deposition leads to complement activation and neutrophil chemotaxis, which eventually creates a loss in adhesion at the dermal-epidermal junction and in blister formation.

Case 7–1/2-year-old initially diagnosed with autoimmune hemolytic anemia, and systemic lupus erythematosus is noted to have IgA deficiency who presents for fevers and respiratory distress. Patient was admitted due to fever to 103 and tachypnia with respiratory distress. The patient was on oxygen and had had cultures drawn, but was otherwise hemodynamically stable. The patient's tachypnea persisted, which eventully lead her to be admitted to the Pediatric intensive care unit. After symtoms continued to persist, patient began to develop multiorgan failure, as well as thrombocytopenia, renal failure, and sepsis, and was placed on high-dose steroids and immunosuppressives. She evenutally developed infections due to Aspergillus, cytomegalovirus, and was at high risk for gastrointestinal bleeding from a multitude of etiologies. In additon, patient required intubation and chronich vent management. The patient finally developed IgA linear dermatosis, and due to the depositions and eventual sepsis, died to infectious causes.

Discussion Linear IgA dermatosis has a bimodal age of onset, with disease in children commencing at ages ranging from 6 months to 10 years old. The disease tends to wax and wane in severity. Drug-induced cases typically resolve quickly once the causative agent is identified and withdrawn. Our case is a rare incidence of which the autoimmunity of the disease process was the underlying cause of spontaneus IgA depositions, and her eventual cause of death.

188 MICRODOSIMETRIC EVALUATION OF PROTON ENERGY DISTRIBUTIONS IN THE VICINITY OF METAL IMPLANTS

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10.1136/jim-d-15-00013.188

Purpose of Study High density materials, such as titanium or stainless steel, are commonly used in reconstructive surgery. However, the presence of such materials for postoperative radiotherapy can impact the dose delivery to the target and surrounding critical structures. In addition, as microscopic biological effects depend on the spectra of secondary particles and spatial distribution of deposited energy, it is possible that the relative biological effectiveness of radiation delivered in the vicinity of an implant could also be altered.

Methods Used Monte Carlo simulations were used to evaluate the microdosimetric distribution of proton radiation in the vicinity of either i) a 3.1mm thick CP Grade 4 titanium plate, ii) a 3.1 mm thick 316 stainless steel plate, or iii) in the absence of a plate, all within a water phantom. Simulations were conducted with implants at the center of modulation (COM) of a spread out Bragg Peak and 3 cm upstream of the COM. A proton energy of 157 MeV (range of ~15 cm in water) was chosen to correspond to clinically relevant irradiations of the paraspinal region where reconstruction often takes place. Average radiation quality factor, dose equivalent and histograms of the energy deposition 1 mm upstream and downstream of the metal plates were calculated and compared with conditions when the plate was absent.

Summary of Results Simulations and analysis are ongoing and the latest results will be presented and discussed.

Conclusions Information from microdosimetric analysis in the vicinity of high density materials could enhance decision making by radiation oncologists in treatment plans where metal implants are present.

189 GENE-ULTRAVIOLET RADIATION INTERACTIONS DETERMINING MELANOMA RISK PHENOTYPES

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10.1136/jim-d-15-00013.189

Purpose of Study We hypothesize that UV exposure history interacts with inherited genetic risk factors and with the somatic mutations within each cancer to impact the clinical presentation of melanoma.

Methods Used To address this hypothesis, we will determine if genetic variants in melanoma risk genes contribute to sun damage assessed through ultraviolet photography (UV damage score) and if selected SNPs interact with the given UV damage score and with other different measures of sun exposure to alter damage by UV light in a cohort.

Summary of Results We plan to uncover the genetic component to clinical variance and to determine if there is a rationale for the use of genetic information to guide clinical decision making. This study will likely show that the severity of sun damage visualized in UV photographs correlates with skin cancer risk factors. This information is paramount in the identification of high risk groups based upon genotype type data and UV exposure history.

Conclusions This study will likely show that the severity of sun damage visualized in UV photographs correlates with skin cancer risk factors. Since UV photographs are an important component of some of the most successful sun protection interventions to date, this would be invaluable knowledge because it would add to the scientific basis of the intervention. As we learn more about how interactions between genetics and sun exposure lead to skin cancer, the integration of a tool that will help quickly assess skin cancer risk while at the same time offering potential as an intervention will be important in focusing skin cancer prevention strategies.

190 EVALUATION OF A DUAL FOCUSING MAGNET SYSTEM FOR TREATMENT OF SMALL PROTON TARGETS

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10.1136/jim-d-15-00013.190

Purpose of Study Proton therapy is a modality of external beam radiation that can treat tumors with fewer beams leading to reduced side effects. However as field size decrease below 1.0 cm diameter, Coulomb scattering broadens the beam and degrades the depth dose profile. Magnetic focusing upstream from the patient could compensate for this effect and enhance dose delivery to the target while sparing surrounding normal tissue.

Methods Used Monte Carlo computer simulations were performed using Geant4.9.6 toolkit to compare dose depositions of proton beams transported through two focusing magnets or in their absence. Magnets were modeled after commercially available magnets currently in experimental use at Loma Linda University Medical Center. The two identical hollow cylinder magnets are constructed of Sm-Co permanent magnet material. Experiments were performed with optimized configurations that were based on the simulation results. Proton beams had energies of 127 MeV and an initial diameter of 5, 8 and 10 mm. Dose was measured by a diode detector and Gafchromic EBT3 film and compared to simulation data.

Summary of Results The experimental data correlated well with Monte Carlo simulations. Beam spot sizes were within 4–11% and P/E ratios differed by –2.6–4.2% between experimental and simulation data. However, under conditions necessary to produce circular beam spots at target depth, the experimental beams focused by the dual magnets had inferior dose distributions (include larger beam spots) and lower dose delivery efficiencies compared to the unfocused beams. Magnetically focused beams for a given initial diameter produced beam spots that were 0.2–0.8mm larger than unfocused beams with the same diameter. Dose delivery efficiency of focused beams were 33–70% of that of unfocused beams.

Conclusions While magnetic focusing using two magnets with identical focusing power did not yield desired results, ongoing Monte Carlo simulations suggest certain arrangements of two magnets with different focusing powers or the addition of a 3rd magnet are promising and might give improved results.

191 SUCCESSFUL TREATMENT OF ACUTE RENAL FAILURE IN PATIENT WITH ACTIVE LUPUS NEPHRITIS AND ATYPICAL HEMOLYTIC UREMIC SYNDROME WITH C5A INHIBITOR, ECULIZUMAB

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10.1136/jim-d-15-00013.191

Case Report Atypical Hemolytic Uremic Syndrome (aHUS) is an orphan disease characterized by uncontrolled hyperactivation of the alternate complement system. Lupus nephritis (LN) is a dreaded complication of Systemic Lupus Erythematosis (SLE) as it portends a poor prognosis. In extremely rare circumstances there is a superimposed aHUS in SLE with LN. Treatment focuses on several different types of immunosuppressive therapy. Development of the monoclonal antibody C5a inhibitor, eculizumab, has expanded the therapeutic armamentarium. We present the case of successful treatment of LN complicated by thrombotic microangiopathy (TM) secondary to aHUS with eculizumab.

A 25 year old female presented with a 4 week history of fatigue, anasarca, dyspnea, and diarrhea. SLE was diagnosed corroborated by a homogenous ANA titer of 1:320 and Anti-dsDNA 1:5,120. Nephrotic range proteinuria with 6.2g/day as well as a serum Creatinine of 3.2 mg/dL were present. CBC was notable for a Hgb of 7.5 g/dL, Platelets 38k, elevated LDH to 368 U/L, negative DAT consistent with a hemolytic anemia. C3 and C4 levels were suppressed at 14mg/dL and 3mg/dL respectively. Peripheral smear showed schistocytes and renal biopsy showed grade IV diffuse proliferative lupus nephritis with extravascular glomerular erythrocytes, suggestive of TM. ADAMTS3 level of 99% ruled out TTP. The patient remained blood transfusion dependent while 4 weeks of therapy with steroids, rituximab, cyclophosphamide, and plasmapheresis proved inefficacious. Clinical suspicion for aHUS was high with the triad of TM, thrombocytopenia, and renal failure. Patient was started on eculizumab. After 14 days she was transfusion independent, improved her creatinine to 1.5 mg/dL and showed platelet recovery.

This case highlights the necessity of understanding the complement system related disorders. Eculizumab has transformed aHUS from a high mortality disease to a chronic illness. Because genetic testing is not very sensitive, diagnosis remains one of exclusion. Extrapolating therapeutic decisions from pathophysiology in the face of treatment refractoriness proved successful. The patient is currently doing well and continuing with treatment.

192 HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS COMPLICATING AN UNUSUAL CASE OF CD16+ EXTRANODAL NK LYMPHOMA, NASAL TYPE WITH BONE MARROW AND CENTRAL NERVOUS SYSTEM INVOLVEMENT

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10.1136/jim-d-15-00013.192

Case Report Natural Killer Cell neoplasms are a rare group of lymphoid malignancies that include nasal and non-nasal extranodal NK/T- cell lymphoma/leukemia (NKTCL) and aggressive NK cell leukemia (ANKL). ANKL is distinguished by it's CD16 and cCD3 positivity. Cure is common in early stages of NKTCL while ANKL is one the most rapidly fatal diseases. Central Nervous system and bone marrow involvement are quite uncommon in the nasal type with reports showing a 7% incidence across all 3 types. A well established complication of NKTCL is hemophagocytic LymphoHisiocytosis (HLH) which leads to multi-organ failure if untreated. We present a rare case of

NKTCL with HLH, bone marrow (BM) and central nervous system involvement with characteristics of both ANKL and NKTCL.

A 53 year old Asian male presented with recurrent sinusitis and a syncopal episode. CBC showed WBC 1.4K, Hgb 6.1g/dL, Plt 14k. CT neck showed a necrotic nasopharyngeal mass with biopsy confirmed NKTCL. By hospital day 7 there was evidence of HLH; LFTs increased from normal to 746 IU/L, 835 IU/L and 807 IU/L for Alk Phos, AST and ALT respectively. Ferritin rose from 4,498 ng/mL to >15,000 ng/mL. LDH rose from 467 IU/L to 1,357 IU/L. IL–2R (CD25) was elevated to 1,809 pg/mL. Dexamethasone 10 mg/m2 IV Q12H was initiated. Serum EBV load was log6. NK Cell Function Assay was showed 4 LU10(nl >7LU10). Bone marrow biopsy revealed 70% involvement with CD16+, CD56+, cytCD3+, EBER+, CD4-, CD8- cells consistent with NK cell origin. Flow cytometry of BM and CSF showed the same repertoire of surface markers. The patient completed 2 cycles of the SMILE regimen but passed from refractory disease in 8 weeks.

While NKTCL and ANKL are classified as separate entities with differing IHC and flow cytometry profiles, they very likely represent 2 ends of the spectrum of one disease driven by the same malignant clone. While his demographic and nasal mass were consistent with NKTCL, CD16 and cytCD3 positivity withbone marrow and CNS involvement were more consistent with ANKL, as was his disease course.Further research is needed to better elucidate the mechanisms of disease as well as develop therapeutics.

193 A RARE CASE OF EBV NEGATIVE T-CELL POST RENAL TRANSPLANT LYMPHOPROLIFERATIVE DISORDER

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10.1136/jim-d-15-00013.193

Case Report Post-transplant lympholproliferative disorders comprise a rare group of malignancies seen in solid-organ and hematopoetic transplantation. 90% of these malignancies are of B-cell origin while 10% are a heterogenrous group of T-cell lymphomas, described in rare case reports. T-cell variants are rapidly progressive with high a mortality incidence. Variables that increase the incidence include cumulative immunosuppression levels as well as EBV positivity.

We present the case of a 35 year old male with a renal transplant at age 18 for focal segmental glomerulosclerosis. Complaints of fatigue, weight loss and petechiae resulted in a CBC showing WBC 23.4K, Hgb 9.0 g/dL, Plt 7k. Bone marrow biopsy and CT imaging showed no evidence of lymphoma. Clinical suspicion remained high and the patient was rescanned 3 months later for persistent symptoms and an accessible lymph node was biopsied. Histology revealed effaced nodal architecture by sheets of T-Lymphocytes surrounding small residual germinal centers. T-cells IHC staining was positive for CD 2,3,4,5, and bcl-2 but negative for EBV, CD7,8 by IHC. Ki-67 of 10% was noted on stains. Bone marrow flow cytometry corroborated the T-cell lineage with the same surface marker reportoire. T-cell beta and gamma receptor gene rearrangement clonality was confirmed by PCR. The patient completed a regimen including cyclophosphamide, liposomal doxorubicin, vincristine, and prednisone (CCOP) with only a partial PET scan response.

The extremely low proliferation index, T-cell subtype, EBV negativity and time to diagnosis make this case unique. T-cell PTLD are a very rare subset of LPD with no randomized clinical trials determining the superiority of any one regimen. Oncogenic mechanisms have not been well elucidated, but murine Xenografts have now been developed. The Ki-67 of 10% is more than 2 standard deviations below reported averages for this subtype. Developing clinical trial will remain a formidable challenge given the tumor's rarity, histologic heterogeneity, and paucity in the pathophysiologic mechanisms of this disease. While we extrapolate therapeutic decision from other T-cell lymphomas, the future may change with next generation sequencing and immunotherapy.

194 WEATHERING A CYTOKINE STORM: A CASE OF HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS

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10.1136/jim-d-15-00013.194

Case Report Hemophagocytic Lymphohistiocytosis (HLH) is a rare and life threatening disease caused by excessive immune activation with histiocytic/lymphocytic infiltration. Diagnosis is difficult as it can mimic many diseases, some of which trigger HLH including infection, malignancy. As such, the true incidence of adult HLH is unknown.

A 29-year-old Hmong male presented with a 6 month history of abdominal pain, weakness and increasing confusion. On exam he was awake but cachectic, jaundiced, with diffuse petechiae and splenomegaly and a BP of 72/46. He was in multi-organ failure with AST 504 U/L, ALT 247 U/L, total bili 13.9 mg/dl, INR 1.89, Crt 1.67 mg/dl, and pancytopenic with WBC 1500/mm3, Hgb 3.8 g/dL, Platelet 6000/mm3. Chest X-ray showed bilateral infiltrates concerning for ARDS and he was intubated for hypoxic respiratory failure. Multiple vasopressors and broad spectrum antibiotics were initiated for presumed septic shock due to pneumonia. Initial evaluation for underlying HIV, TB or leukemia/lymphoma was negative and no infectious source was identified. Abdominal CT demonstrated splenomegaly, multiple liver and splenic lesions and a lymph node mass. Family declined biopsy due to the risks and thus malignancy was not excluded. His ferritin was 13444 ng/mL; concern for HLH prompted further work-up which showed fibrinogen 104mg% and soluble IL-2 receptor of 10210 pg/ml. His bone marrow biopsy was hypocellular with histiocytic prominence, rare hemophagocytosis and many EBV positive cells completing diagnostic criteria for HLH, suspected to be due to EBV. He was started on IV dexamethasone and rituximab. While ferritin levels decreased after 5 days of treatment the patient became obtunded, remained ventilator dependent and hypotensive despite vasopressor support and ultimately passed away.

HLH has a variable presentation and should be

considered in patients with hypotension and multiple organ failure, including pancytopenia. Often times if an infectious or malignant source is identified; HLH which can be precipitated by these diseases, is missed. To help identify HLH, a significantly elevated ferritin (>10,000 ngmL) can be highly specific. Early diagnosis is imperative so treatment can be promptly initiated. Perhaps the delayed presentation and thus late recognition of HLH in our patient led to a poor prognosis.

195 ATYPICAL PRESENTATION OF LOW-GRADE FIBROMYXOID SARCOMA IN THE ANTERIOR MEDIASTINUM IN A 73 YEAR OLD FEMALE

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10.1136/jim-d-15-00013.195

Introduction Low grade fibromyxoid sarcomas are rare soft tissue neoplasms. They generally occur in young adults and arise out of the soft tissue in the extremities. These tumors were first described in 1987 by Evans *et al*. LGFMS typically have a benign appearance and indolent course although rarely have been shown to dedifferentiate and become malignant.

Case report Here we report the case of a 73 year old female with LGFMS in the anterior mediastinum who initially presented with progressive dysphagia. Bronchoscopy revealed inflammatory tissue and subsequent CT scan demonstrated massive mediastinal adenopathy with a large mass compressing the esophagus. She had a mediastinoscopy with biopsy that demonstrated pathology suggestive of fibrous tissue with granulomatous inflammation. The patient's clinical situation deteriorated as the mass continued to enlarge. She therefore underwent left thoracotomy and mediastinal tumor resection. Histologically, the tumor was determined to be a low-grade fibromyxoid sarcoma with giant collagen rosettes extending to and involving peripheral resection margins. Immunohistochemical staining revealed the tumor to be weakly CD99 positive and focally MSA positive. Staining was negative for pankeratin, EMA, desmin, CD34, S100, AFB and GMS.

Discussion To the best of our knowledge this is the first case presentation of LGFMS in a 73-year old female patient in the anterior mediastinum.

Conclusion At the time of this report the patient was in a rehabilitative facility recovering from her surgery.

196 FATAL SICKLE CELL CRISIS DUE TO CANDIDA ALBICANS INFECTION IN A CHILD

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10.1136/jim-d-15-00013.196

Case Report Acute chest syndrome (ACS) is a well described complication with good outcomes in sickle cell disease patients commonly caused by Mycoplasma pneumonia or encapsulated bacteria. We report a fulminant and fatal case of ACS secondary to Candida albicans infection. An 8-year-old African American boy with homozygous sickle cell disease presented with dry cough, chest pain, and fever of 39.4^0 Celsius. His investigations revealed an elevated white cell count of 20,300/cmm with 82% neutrophils, hematocrit of 24%, and reticulocyte count of 11%, and his chest x-ray was unremarkable. He was admitted to the hospital and treated with antibiotics, oxygen therapy, and analgesics. Over the next 24 hours, he continued to remain febrile, requiring increased oxygen support, and morphine for pain control. His repeat chest x-ray revealed diffuse bilateral multifocal pulmonary infiltrates. Shortly thereafter, he developed cardiopulmonary arrest requiring chest compression, endotracheal intubation, and epinephrine. He received inotropes for hemodynamic stabilization, mechanical ventilation for ARDS, inhaled nitric oxide for suspected pulmonary hypertension, 2 exchange transfusions to reduce his sickle cell load, and renal replacement therapy for acute renal failure. Cultures of his blood and endotracheal tube secretions as well as respiratory viral panel were negative. He developed cerebral edema and succumbed to multi-organ failure within the next 48 hours. His autopsy undertaken the same day as his death revealed heavy and edematous lungs with abundant fungal organisms noted throughout the alveolar spaces of all five lobes of the lungs. Bilateral lung cultures and tracheal culture were positive for Candida albicans. Candida albicans is an unusual organism to cause ACS in sickle cell patients. Neutrophil function, a requirement to kill Candia albicans, can be impaired in sickle cell patients. Lack of significant leukocyte function may explain the lack of macrophage and/or neutrophil ingestion of Candida albicans detected in post-mortem studies of our patient. Although rare, Candida infections should be considered in managing sickle cell crisis that are non-responsive to standard therapy.

197 ROLE OF TRANSFORMING GROWTH FACTOR-BETA IN MEDIATING INFLAMMATION AND ANGIOGENESIS IN SMAD4 DEFICIENT HEAD AND NECK SQUAMOUS CELL CARCINOMAS

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10.1136/jim-d-15-00013.197

Purpose of Study Stromal overexpression of transforming growth factor-beta (TGF- β) is observed in Smad4 deficient head and neck squamous cell carcinomas (HNSCCs) and is known to upregulate inflammation and angiogenesis. Our preliminary studies in Smad4 deficient HNSCC mice have revealed that inhibition of the TGF-β receptor (TGF- βR) did not affect tumor growth but did significantly decrease the number of metastatic lesions. We aim to elucidate the specific mechanisms by which TGF-β signaling promotes this metastatic phenotype of Smad4 deficient HNSCCs. We hypothesized that Smad4 deficient tumors overexpress TGF-β to create an inflammatory microenvironment and promote angiogenesis to drive tumor progression *in vivo*..

Methods Used Nude mice were flank injected subcutaneously with Smad4 deficient SCC cells and treated with

either a TGF- βR inhibitor (n=5) or a vehicle control (n=6) once primary tumors reached 1mm^3. Frozen sections of the primary tumor were analyzed using immunofluorescence. We probed for leukocyte marker CD45, macrophage marker F480, and endothelial cell marker CD31.

Summary of Results Smad4 deficient SCCs treated with the TGF- βR inhibitor showed a decrease in CD45+ leukocytes compared to the vehicle control group. However, there was no difference in F480+ macrophages. There was also no change in angiogenesis as measured by the number of blood vessels/mm^2 and the percentage area of the tumor covered by blood vessels.

Conclusions Smad4 deficient SCC tumors treated with the TGF- βR inhibitor showed a decrease in leukocytes, suggesting TGF- β plays a role in mediating inflammation in the stromal environment. Although there was no difference in the total number of macrophages, a subtype of macrophages could be responsible for the difference in leukocytes we observed. Myeloid-derived suppressor cells (MDSCs) may also contribute to this difference, as they are increased in tumor-bearing animals and promote tumor progression. We would like to examine different macrophage subtypes and MDSCs in the same Smad4 deficient SCC tumors from TGF- βR inhibitor treated mice and the vehicle controls to investigate further the role of TGF-β in promoting tumor progression.

198 CHANGES IN EXPRESSION OF METABOLIC GENES IN IMMORTALIZED MOUSE EMBRYONIC FIBROBLAST CELLS IMPACT GROWTH AND FITNESS

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10.1136/jim-d-15-00013.198

Purpose of Study Cancer cells metabolize glucose in a distinct manner, favoring aerobic glycolysis over mitochondrial oxidative phosphorylation—a phenomenon termed "the Warburg Effect". Our lab has been focused on key metabolic genes associated with tumor fitness. We hypothesize that exogenous expression or downregulation of these key metabolic genes in immortalized mouse embryonic fibroblasts (MEFs) with distinct mutational genetic backgrounds will influence growth rate and fitness.

Methods Used Immortalized MEFs are cultured under 3T9 protocol. Retroviral and doxycycline-inducible lentiviral vectors were used for infection of RNAi and gene constructs. Western blot analysis was used for measuring protein expression post-infection.

Summary of Results We could not identify a significant change in growth rate or protein expression between non-infected MEFs and those infected with our selected metabolic genes or their respective miRNA. We believed these inconclusive results are reflective of the retroviral vector used. We changed our strategy, designing a more targeted shRNA construct for subsequent infections with dox-induced lentiviral vectors. However, due to the complex nature of inducible expression systems, our results currently remain inconclusive.

Conclusions Our findings, albeit inconclusive, are not entirely surprising. Given that immortalized MEFs post-infection undergo extensive selection, loss of metabolic genes would be markedly disadvantageous. Thus, a single cell capable of gaining a compensatory mechanism against the shRNA will have a selective growth advantage and take over the culture's cell population. With an inducible system, we expect cell growth to decrease with initial induction, only to recover rapid growth with accrual of distinct compensatory changes. Likewise, we believe that no changes could be detected in MEFs with increased expression of our selected metabolic genes because these cells may have already accrued related survival mechanisms, critical to tumor fitness. Future experiments will address metabolism and tumor fitness using a more network-wide approach, targeting multiple enzymes simultaneously.

Poster Session
Infectious Diseases
6:00 PM
Thursday, January 28, 2016

199 GROUP A STREP: STILL A THREAT THREE PRESENTATIONS OF INVASIVE GROUP A β-HEMOLYTIC STREPTOCOCCUS

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10.1136/jim-d-15-00013.199

Case Report Group A Streptococcus (GAS) is a common causative agent in a number of childhood illnesses. The majority of GAS infections are relatively mild illnesses including GAS pharyngitis or impetigo. Well-known sequelae to these infections include scarlet fever, rheumatic fever, and glomerulonephritis but GAS can be responsible for a number of severe and life-threatening conditions as well. Here we will highlight three cases of invasive GAS and a review of the literature of invasive GAS in the pediatric population.

A 4 year old previously healthy female presented to the emergency department (ED) with a 5 day history of fever, dry cough, and increased work of breathing. In the ED she was found to be in respiratory distress with hypoxemia. Chest X-ray (CXR) revealed right middle lobe infiltration with significant pneumothorax. The patient was intubated and admitted to the pediatric intensive care unit (PICU). Cultures were positive for GAS. This is a case of necrotizing pneumonia due to GAS.

A second case is of a 2 year old male who presented to the ED with fever and generalized maculopapular erythematous rash. He was ill-appearing and lethargic. His vital signs were significant for hypotension and a renal function panel revealed renal insufficiency. He met criteria for Toxic Shock Syndrome and was admitted to the PICU. Later, his blood culture revealed GAS.

The third case is of a 7 year old male who presented to the ED with a limp. He noted pain in the right lower leg with a fever of 2 days duration. He denied trauma to the area with no obvious bruising on physical exam. X-ray of the limb was negative however an MRI was consistent with osteomyelitis. Blood culture grew GAS which caused the Osteomyelitis.

GAS plays a role in a number of invasive and life-threatening infections. There is a growing number of cases of invasive GAS infection, some causing significant morbidity and mortality. Thus, pediatric practitioners should have a high index of suspicion about the invasive nature of GAS. We have highlighted three cases of invasive GAS to increase awareness amongst clinicians.

200 16 YEAR OLD MALE WITH LEFT NECK SWELLING

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10.1136/jim-d-15-00013.200

Case Report A 16 year old male presented to the emergency department with left jaw and neck swelling. Two days prior to admission he had complained of stomach pain and a "flu bug". He had multiple episodes of emesis but no fevers. He also noted a previous sore throat, and some nasal congestion. On the day of admission he was brought to his pediatrician who noted swelling of the left side of the face and ordered a CT of the head and neck. All other review of symptoms were negative, and his vaccinations were up-to-date for age except for the seasonal influenza vaccination.

The patient was admitted to the general pediatric floor and started on Ampicillin-sulbactam on day 2 of admission, but started to have worsening of symptoms. On day 2 of admission his physical exam showed a left eyelid droop with mild left eye ptosis, normal extraocular eye movement, and pain with the left eye movement. He was also developed swelling along the lateral aspect of the left eye and temporal area. He also had trismus, and his posterior oropharynx was erythematous without any lesions or exudate. Along the left neck he had tenderness and swelling along the lateral sternocleidomastoid muscle, as well as with movement of the neck. The rest of his physical exam was within normal limits. Infectious disease suggested obtaining a blood culture, even though the patient had already been treated with antibiotics.

A Computed tomography of the head and neck showed left internal jugular vein thrombosis with soft tissue edema throughout the left side of the neck. Sinusitis was also noted. Computed tomography of the chest showed multiple irregular cavitary pulmonary nodules suspicious for emboli. Magnetic resonance imaging showed a left temporalis muscle abscess.

LEMIERRE SYNDROME is a rare disease of the head and neck. It generally affects healthy adolescent and young adult patients. The syndrome was best described by a French microbiologist Dr. Andre Lemierre in 1936 based on 20 patients with pharyngitis and septic thrombophlebitis of branches off of the tonsillar or peritonsillar veins. All of his patients had a preceding pharyngeal infection, and a rapid progression of of sepsis with eventual development of metastatic emboli to end points of circulation (especially to the lungs). All of the patients he followed had died from sepsis.

Poster Session
Neonatal Pulmonary
6:00 PM
Thursday, January 28, 2016

201 REFERENCE VALUES FOR RESPIRATORY INPUT IMPEDANCE IN NEWBORN LAMBS

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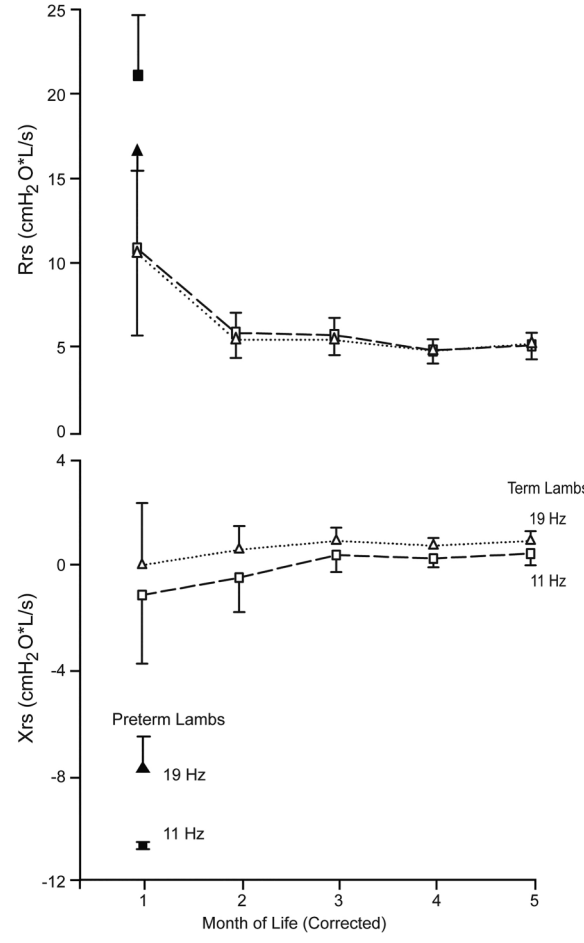
10.1136/jim-d-15-00013.201

Purpose of Study The lamb model of neonatal chronic lung disease provides opportunity to identify mechanisms leading to long-term outcomes. After preterm birth and ventilation, lambs are recovered to 5mo corrected postnatal age (~6 yr corrected postnatal age in humans). A non-invasive method is needed to assess lung function during spontaneous breathing. Forced oscillation technique (FOT) measures respiratory mechanical properties without needing subject cooperation. We tested efficacy of FOT in spontaneously breathing lambs.



Abstract 201 Figure 1

Methods Used FOT measurements were done on term (~150d) lambs (n=7) at month of life 1, 2, 3, 4 and 5. Pressure and flow signals were measured at the nose while applying a sinusoidal pressure force at 11 and 19Hz. Former preterm (~128d) lambs (n=2) were studied at 1 month corrected postnatal age.
Summary of Results The figure shows that reactance (Xrs) increased while resistance (Rrs) decreased with growth. No significant frequency dependence of Rrs was observed, suggesting a homogeneous lung. Former preterm lambs had higher frequency dependence, higher Rrs and lower Xrs values, consistent with a heterogeneous and less compliant lung.
Conclusions FOT measures lung mechanics in spontaneously breathing lambs. We will determine normal reference values for term lambs for comparative analysis of lung mechanics in former preterm lambs to evaluate the long-term impact of preterm birth on lung mechanics and function. NIH HL110002.

202 GENOME OF HIGH FREQUENCY OSCILLATION: ITIME AND BIAS FLOW EFFECTS

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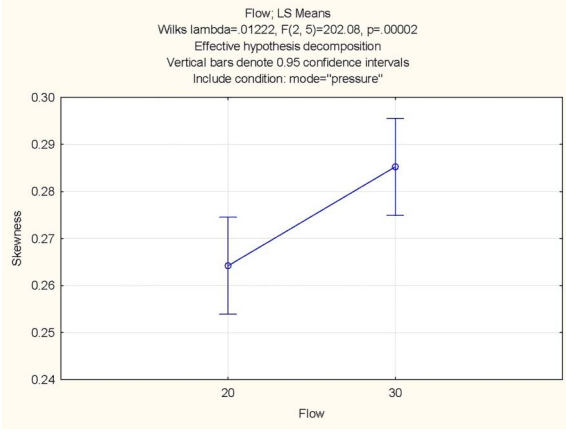
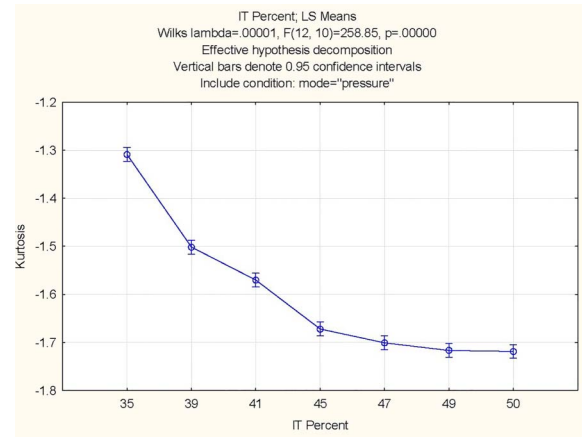
10.1136/jim-d-15-00013.202

Purpose of Study Using High Frequency Oscillation (HFO) only limited parameters have been modified to oxygenate and ventilate neonates. Can I-ime (inhalation time) and bias flow produce similar results keeping the Frequency, MAP (Mean Airway Pressure) and Amplitude the same?.
Methods Used The 3100A HFO and an artificial lung were for the study. Frequency, MAP and Amplitude were fixed at 10 Hz, 20 cmH_2O and 20 cmH_2O respectively.We studied flow and pressure dynamics at I-times from 0.30 to 0.50 and flows of 20 and 30LPM. 10,000 measurements were taken at these settings using EasySense software.
Summary of Results As the flow increases from 20 to 30LPM the pressure curve is more positively skewed from 0.265 to 0.285 ($p<0.00003$). As the I time increases from 0.30 to 0.50, kurtosis decreases from –1.3 to –1.8 ($p<0.000001$).“Kurtosis” is the sharpness of the peak of a distribution curve and “skewness” is a measure of the asymmetry of a variable about its mean.
Conclusions Increase in I-time and flow may influence high frequency ventilation by making the pressure data positively skewed and flat distributed.



Abstract 202 Figure 1



Abstract 202 Figure 1

Poster Session
Neonatology General
6:00 PM
Thursday, January 28, 2016

203 UTILIZATION PATTERNS OF EXTRACORPOREAL MEMBRANE OXYGENATION IN NEONATES WITH HYPOXIC-ISCHEMIC ENCEPHALOPATHY IN THE UNITED STATES 1997–2012

CA Burkhead,[1] A Song,[1] A Lakshmanan,[1] E Ho,[2] P Friedlich,[1] C McLean[1]. *[1]Children's Hospital of Los Angeles, Arcadia, CA; [2]Children's Hospital of Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.203

Purpose of Study Hypoxic-ischemic encephalopathy (HIE) remains a serious condition that causes significant mortality and long-term morbidity. There is limited information on resource utilization patterns of neonates with HIE who receive extracorporeal membrane oxygenation (ECMO) nationwide. The purpose of the study is to determine if resource utilizations of neonates with HIE differs between those who were placed and ECMO and those neonates not placed on ECMO.
Methods Used We conducted a retrospective data analysis of the Kids' Inpatient Database from 1997 to 2012. Neonates with HIE (IC-9-CM codes 768.0–3, 768.5) who underwent ECMO (ICD-9-CM code 39.65).
Summary of Results Of the 32,342 cases of neonates with HIE identified between 1997 and 2012, 33.3 % were White who were placed on ECMO, while 52.5% of patients were White who were not placed on ECMO. Race was found to be statistically significantly associated with whether or not a patient was placed on ECMO ($p<0.0001$). Primary expected payer was also statistically significantly associated with whether or not a patient was placed on ECMO

($p<0.0001$); the majority of ECMO patients (45.8%) had Medicaid while the majority of patients not placed on ECMO (53 %) had paid through a private insurance. Length of stay (SD) was statistically significantly higher 21 (24) days for ECMO patients vs. those were not placed on ECMO 5 (15) days ($p<0.0001$). Total charges (SD) were statistically significantly higher 1.7 (0.17) per one hundred thousand dollars for those placed on ECMO compared to those not placed on ECMO .15 (0.76) per one hundred thousand dollars.The majority (82%) of patients placed on ECMO treated in urban teaching hospitals whereas the majority of patients on placed on ECMO (46.1%) were treated in urban non-teaching hospitals.

Conclusions Neonates with HIE who were white males with Medicaid were more likely to be placed on ECMO, whereas neonates with HIE who were white males with private insurance were more likely to not be placed on ECMO. For those neonates placed on ECMO, the majority were located in urban teaching hospitals compared to those neonates not placed on ECMO were more likely to have been in an urban non-teaching hospital.

204 ACCESS TO TECHNOLOGY FOR COMMUNICATION IMPROVES HEALTH-RELATED QUALITY OF LIFE FOR LOW INCOME FAMILIES AFTER NEONATAL INTENSIVE CARE UNIT DISCHARGE

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10.1136/jim-d-15-00013.204

Purpose of Study To describe access to technology for communication, and identify whether certain forms of technology are predictors for decreased parental and family burden.

Methods Used Parents of preterm infants attending a high-risk infant follow up clinic were surveyed. We examined access to technology including internet, email, text and smartphone ownership. We used bivariate and multivariable (MV) analysis to compare use of technology with: (1) Impact on Family Scale (IOF) (higher scores=worse functioning), (2) Infant and Toddler Quality of Life Questionnaire (ITQOL) parent-emotion and parent-time subscores (lower scores=increased burden).

Abstract 204 Table 1

	IOF sub-score, mean (SD)	p-value
Predictor (% of sample)		
Internet		0.0005
Use (77)	33 (10)	
No Use (23)	40 (11)	
Smart-phone		0.05
Use (79)	33 (10)	
No Use (21)	38 (12)	
Texting		0.07
Use (88)	34 (11)	
No Use (12)	40 (10)	

Summary of Results Of 104 participants, 74% were Hispanic and 63% had an annual household income< $20,000. The mean (SD) IOF score was 34.4 (10.8) and the ITQOL parent-emotion and parent-time scores were 78.3 (22.4) and 78.3 (23.2). The association of access to technology and IOF measure is summarized in the table. On MV analysis, the capability to text increased the parent-time score estimate by 15 (7) points, p value=0.03.

Conclusions Parental access to various forms of technology after discharge from the NICU decreased the IOF score while use of texting increased parental-time. Advocating for parental access to internet-abled devices may attenuate family and parental burden.

205 IMPROVING PROCESS MEASURES OF TIMELY FAMILY MEETINGS IN NEONATAL INTENSIVE CARE: AN INTERDISCIPLINARY QUALITY IMPROVEMENT PROJECT

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10.1136/jim-d-15-00013.205

Purpose of Study Neonatal intensive care unit (NICU) studies frequently demonstrate inadequate parent-team communication. Timely family meetings decrease health care utilization and improve family-reported outcomes in adult intensive care. Quality improvement (QI) initiatives have increased family-meeting frequency in adult settings, however, similar initiatives for critically ill children have not been reported. As a way to improve timely parent-team communication in the Mattel Children's Hospital NICU, we aim to measure and increase the frequency of multidisciplinary family meetings (MDFM) documented within 5 days of admission.

Methods Used An interdisciplinary team of nurses and physicians employed Model for Improvement methodology in the NICU at Mattel Children's Hospital, a regional level IV center. A multi-faceted intervention, consisting of an electronic note template, centralized calendar and direct clinician outreach, was implemented on March 1, 2015. Timely family meeting process measures were quantified through chart review of all infants hospitalized for ≥5 days pre-intervention (January 2014–February 2015) and post-intervention (March 2015–August 2015). Physician dissatisfaction was assessed as a balancing measure using surveys in the post-intervention period. This QI project was exempt from review by the UCLA IRB.

Summary of Results Documentation of MDFM increased following the intervention (pre: 10.3% [$n=300$]; post: 29.3% [$n=116$]; $p=0.0001$). NICU physicians surveyed ($n=13$) viewed family meetings as valuable to their patients' care (85%, 11/13) and not burdensome either personally (92%, 12/13) or professionally (77%, 10/13).

Conclusions A multi-faceted quality improvement intervention can improve timely family meeting process measures in a regional level IV NICU. Academic neonatologists approve of efforts to increase parent-team communication.

206 INCIDENCE OF CLINICAL COMPLICATIONS IN INFANTS OF DIABETIC MOTHERS IN THE NICU OVER A 5-YEAR PERIOD

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10.1136/jim-d-15-00013.206

Purpose of Study Maternal diabetes is a well-known human teratogen. The purpose of this study was to determine the cumulative incidence of clinical complications in infants of diabetic mothers in the NICU at Loma Linda University Children's Hospital (LLUCH). LLUCH serves a population with poor access to care, in which the rates of diabetes has increased steadily in the past decade.

Methods Used This is a retrospective chart review of infants admitted to the NICU at LLUCH for the years 2010–2015 with the ICD-9 code 775.0 (Infant of Diabetic Mother- IDM). IDM babies with other teratogenic exposures or genetic syndromes as the underlying etiology for their clinical features were excluded.

Summary of Results There were a total of 267 infants with the diagnosis of IDM in the NICU in the past 5 years. 48% were born to mothers with pre-gestational diabetes and 46% to mothers with gestational diabetes; the type of maternal diabetes was not documented in 6%. On average, 4.2% (95% Confidence Interval: [2.88, 5.48]) of NICU babies were IDM. 43% of these infants were born premature. The 5-year cumulative incidence of C-section done for maternal or fetal complications was 67.4%. The risk of birth defects was 22.8%, with 61/267 babies affected. Of these, 21 (34%) had multiple congenital anomalies. Of all birth defects in IDM, a cardiac anomaly was seen in 64%, CNS anomaly in 26%, musculoskeletal anomalies in 16%, craniofacial anomalies in 13% and renal anomalies in 13%. Of all IDM, 12% had other cardiac complications (ventricular hypertrophy/ cardiomyopathy), with the incidence being highest in 2014 at 17.8%, compared to an average of 12% over 5 years.

Conclusions This chart review was undertaken as a pilot study due to anecdotal evidence of an increase in the rate of IDM admissions at LLU. This review is restricted to infants in the NICU and is limited by use of a single diagnostic code. The 5-year incidence proportion of birth defects seen at LLUCH in IDM (22.8%) is twice as much as reported in the published literature (10%), even when looking at just NICU admissions. We intend to use this information to study the genetic, socioeconomic and environmental factors driving this increase.

207 RESOURCE UTILIZATION FOR NEONATES WITH TRISOMY 18 IN CALIFORNIA

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10.1136/jim-d-15-00013.207

Purpose of Study: Background While it is recognized that Trisomy 18 in neonates is associated with significant mortality, there is limited information regarding health care resource utilization and predictors of length of stay (LOS) for survivors versus non-survivors.

Objective (1) To determine if health care resource utilization differed for survivors versus non-survivors (2) To identify predictors of LOS.

Methods Used We studied data from the California Office of Statewide Health Planning and Development (OSHPD) for years 2000 to 2002 and 2010 to 2012. Trisomy 18 patients were identified using ICD-9-CM codes (758.2); survival to discharge was determined based on OSHPD disposition codes. Bivariate tests were used to compare characteristics of survivors and non-survivors. Multivariable (MV) analysis was completed to identify predictors of LOS.

Summary of Results 1,544,045 newborns were identified during 2000–2002 and 1,544,638 during 2010–2012. Of 222 patients with Trisomy 18 in 2000–2002, mortality was 52% while it was 52% for the 254 in 2010–2012. Statistically significant differences were observed for several variables for survivors versus non-survivors in both epochs outlined in the table. For non-survivors, on MV analysis, adjusting for in-born versus out-born status, insurance and co-morbidities associated with Trisomy 18,>96 hours of mechanical ventilation increased LOS (SE) by 17.3 (2.2) days.

Conclusions In both epochs, LOS was shorter for non-survivors. Independent of other predictors, mechanical ventilation increased LOS for non-survivors. We identified several factors that could affect health care delivery for this high-risk population.

208 RESOURCE UTILIZATION FOR NEONATES WITH TRISOMY 13 IN CALIFORNIA

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10.1136/jim-d-15-00013.208

Purpose of Study: Background While it is recognized that Trisomy 13 in neonates is associated with significant mortality, there is limited information regarding health care resource utilization and predictors of length of stay (LOS) for survivors versus non-survivors.

Objective Objective: (1) To determine if health care resource utilization differed for survivors versus non-survivors (2) To identify predictors of LOS.

Methods Used We studied data from the California Office of Statewide Health Planning and Development (OSHPD) for years 2000 to 2002 and 2010 to 2012. Trisomy 13 patients were identified using ICD-9-CM codes (758.1); survival to discharge was determined based on OSHPD disposition codes. Bivariate tests were used to compare characteristics of survivors and non-survivors. Multivariable (MV) analysis was completed to identify predictors of LOS.

Summary of Results 1,544,045 newborns were identified during 2000–2002 and 1,544,638 during 2010–2012. Of 124 patients with Trisomy 13 in 2000–02, mortality was 58% while it was 63% for the 97 in 2010–2012. Statistically significant differences were observed for several variables for survivors versus non-survivors in both epochs outlined in the table. For non-survivors, on MV analysis, adjusting for in-born versus out-born status, insurance and co-morbidities associated with Trisomy 13,>96 hours of mechanical ventilation increased LOS (SE) by 12.5 (2.8) days. Please see attached supplemental table for further results.

Conclusions For non-survivors, in 2000–2, there was more use of mechanical ventilation and in 2010–12, LOS was shorter for non-survivors than survivors. Independent of other predictors, mechanical ventilation increased LOS for non-survivors. We identified several factors that could affect health care delivery for this high-risk population.

209 NICU FELLOWSHIPS PROVIDE LESS ACCESS AND TRAINING IN POINT-OF-CARE ULTRASONOGRAPHY THAN PICU TRAINING PROGRAMS

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10.1136/jim-d-15-00013.209

Purpose of Study Ultrasound devices are becoming increasingly available in neonatal and pediatric critical care units as a non-invasive complement to routine clinical care. This study evaluates the current state of point-of-care ultrasonography (POCUS) use and education among Neonatology (NICU) and Pediatric Critical Care (PICU) fellowship programs.

Methods Used A 14-question survey was emailed to the fellowship directors of all United States NICU (n=95) and PICU (n=66) training programs in summer 2015. The two groups were compared using chi-square and Fisher exact tests as appropriate.

Summary of Results The response rate was 38% and 39% for NICU and PICU, respectively. There were significant differences in term of equipment availability, use, and training of POCUS (Table). While for PICU the "lack of time to learn" was the most appreciated barrier to POCUS use; NICU perceived "liability concerns" and "lack of funds/equipment" as the most significant barriers. There were some similarity between NICU and PICU. Over 90% of respondents in both groups believe that fellows and attendings should be trained. In addition, they have similar views on the benefits of POCUS, especially for the "availability for acute diagnosis/management" and "improve procedural success/minimize complications".

Abstract 209 Table 1 POCUS access, use, and training in Neonatology and Pediatric Critical Care fellowship programs

	NICU (36)	PICU (26)	p
Access to US/ECHO machine	61%	96%	0.002
Use for diagnosis or management	25%	69%	0.001
Use for procedures	31%	92%	<0.001
Training offered	21%	87%	<0.001

Conclusions Compared to pediatric critical care, neonatal fellowship programs have more limited access to ECHO and US machines. PICUs more frequently use POCUS for clinical diagnosis/management and procedures and train their fellows and attendings compared to NICUs. However, both have similar views on the benefits of POCUS and most believe that their physician should receive training.

210 NEONATAL SPLENIC HEMATOMA CAUSING HEMOPERITONEM AND HYPOVOLEMIC SHOCK

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10.1136/jim-d-15-00013.210

Case Report At 41 weeks gestation, a girl was born via uncomplicated vaginal delivery. The neonate was well until 24 hours of life then had decreased activity and tone, gagging with feeds, and pallor. The patient's Hgb/Hct (H/H) were 10.4g/dL and 30.9% with metabolic acidosis noted. The abdominal girth acutely increased, and a repeat H/H fell to 3g/dL and 12%. She received a packed red blood cell transfusion then was intubated for transfer to a NICU.

The blood bank was contacted prior to admission but lacked the ability to initiate a neonatal massive transfusion protocol so NICU staff outlined what was needed. Upon arrival, the patient was pale, tachycardic, and hypotensive with abdominal distension. She was rapidly transfused uncrossmatched blood products. An abdominal U/S documented intraperitoneal fluid and concern for splenic rupture. There was transient hemodynamic stability after transfusion until the patient developed signs of abdominal compartment syndrome: loss of lower extremity pulses, worsening distention, and hyperemic discoloration to the lower abdomen and extremities. Pediatric surgery performed an emergency exploratory laparotomy but hemostasis could not be achieved necessitating a splenectomy. Pathology confirmed a ruptured splenic hematoma. The patient recovered and continues to do well.

The rare complications of neonatal splenic rupture and hemoperitoneum were first reported in 1948. To date, the incidence and mortality rates of splenic hematoma/rupture remain unknown. Hemoperitoneum in the neonate can be difficult to identify, even if the typical triad of shock, anemia and bluish abdominal distension is seen. Ultrasound (and CT scan) can confirm the diagnosis. However, improving survival of neonates with this rare but treatable condition requires heightened awareness and aggressive resuscitation. Rapid availability and administration of blood products can reverse potentially fatal hypovolemic shock and multi-organ dysfunction. Massive transfusion protocols exist for adults and decrease morbidity and mortality. Yet, little data document or support their use in neonatal patients. This case highlights the need for appropriate neonatal trauma protocols.

Poster Session
Pulmonary & Critical Care Adult
6:00 PM
Thursday, January 28, 2016

211 UTILIZING A MULTIMODAL APPROACH IN TEACHING MEDICAL STUDENTS ULTRASOUND-GUIDED PROCEDURES

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10.1136/jim-d-15-00013.211

Purpose of Study Formal ultrasound education has been incorporated into several medical schools across the country, but few are teaching students how to perform Ultrasound guided-procedures. The purpose of this study was to assess the effectiveness of a fifty-minute ultrasound-guided procedural training module for medical students utilizing a multimodal approach.

Methods Used This was a self-control prospective observational cohort study. The ultrasound-guided procedural training module was taught at our institution's 2015 Ultrafest ultrasound symposium. We assessed participants' comfort level with ultrasound using a pre-event survey and a post-event survey. The training included fifteen-minutes of didactics and thirty-five minutes of hands on training utilizing simulation manikins. The ultrasound-guided procedures taught were: peripheral vascular access, lumbar puncture, thoracentesis, needle biopsy, and central line access. Comparisons were analyzed with the Wilcoxon signed-rank test.

Summary of Results Fifty-three participants from six medical and osteopathic schools in Southern California completed both preliminary and post event surveys using a 5-point Likert scale. In each procedure there was statistically significant improvement in confidence of participant's overall technique ($p<0.0001$), ability to identify pertinent anatomy ($p<0.05$), ability to track the tip of the needle to avoid puncturing nearby anatomical structures ($p<0.0001$), and ability to perform each procedure on a real patient ($p<0.0001$). After the training, 96% of the participants agreed or strongly agreed that ultrasound procedural training should be incorporated into their medical school's curriculum.

Conclusions This study suggests that teaching medical students with a fifty-minute session at a symposium can increase their confidence in performing US guided procedures both in the ability to perform the procedures and track the needle and in the technique of the procedures. This study supports the value of incorporating procedural training into undergraduate medical education.

212 A CASE OF URTICARIA THAT RESULTED IN A BROKEN HEART

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10.1136/jim-d-15-00013.212

Case Report A 16 year old male presented with acute urticaria of six hours duration. He described onset of severe pruritus and urticaria over his neck and torso that was spreading to involve his face, including mild lip swelling, but denied any airway, gastrointestinal or cardiovascular symptoms. He was given IV diphenhydramine and methylprednisolone with minimal relief. Epinephrine 0.5 mg IM was ordered and entered correctly into the record, but was administered IV by the nurse. The patient's mother reported she asked the nurse if she was sure it should be given IV as she was familiar with epinephrine autoinjectors; the nurse stated her certainty without rechecking the order. The patient rapidly developed hypertension, BP 166/116, wide complex tachycardia and desaturation with respiratory distress. He was intubated and transferred to another facility. Echocardiogram showed severely diminished left ventricle function, consistent with Takotsubo cardiomyopathy, also known as "broken-heart" syndrome, and evidence of ischemia, with troponins up to 2.3 ng/ml. He was extubated on day 2. Repeat echocardiogram on day 4 showed normalized left ventricle function. His urticaria improved by day 3 on twice daily cetirizine 10 mg orally. This case is a reminder that despite well-intentioned health care professionals, patients continue to face risks caused by human fallibility. Epinephrine is considered very safe when given IM, but may have serious adverse effects when IM doses are administered IV in non-code situations. In this case, the patient was not experiencing anaphylaxis, but IM epinephrine was ordered to stop his urticaria, which is an option. Key human factors in this case identified so far include a knowledge deficit and failure to recheck the order when confronted by the patient's representative that it might be an error. System improvements could include targeted training of all staff on best practice management of anaphylaxis and flagging high risk orders to confirm and highlight the dose and route. With the lifetime prevalence of anaphylaxis up to 2% of the population, and the fact that epinephrine is the treatment of choice, we need to emphasize how easily a life-saving medication can become life-threatening if not used correctly.

Poster Session
Surgery
6:00 PM
Thursday, January 28, 2016

213 IDENTIFICATION OF POTENTIAL RISK FACTORS ASSOCIATED WITH DEVELOPMENT OF SYNECHIAE FOLLOWING FUNCTIONAL ENDOSCOPIC SINUS SURGERY: A RETROSPECTIVE REVIEW

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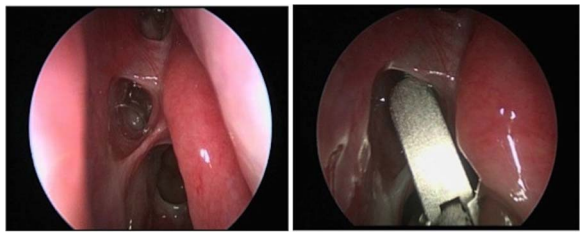
10.1136/jim-d-15-00013.213

Purpose of Study Synechiae formation in the middle meatus is one of the most common complications of functional endoscopic sinus surgery (FESS). Synechiae describes the adhesion of two opposing mucosal surfaces in the nasal cavity that can cause scarring and obstruction of the nasal passage (Figure 1).



Abstract 213 Figure 1 Synechiae (left). In-office division (right).

Objectives 1) To determine the incidence of synechiae occurring in a cohort of patients who had undergone FESS.

2) To determine characteristics associated with development of synechiae postoperatively.

Methods Used This retrospective study examined chronic rhinosinusitis (CRS) patients with or without nasal polyposis that had undergone bilateral FESS at a tertiary rhinology centre. All patients received middle meatal merocel spacers intraoperatively left *in situ* for six days and followed up in clinic at least once per month for the first three months following FESS.

Summary of Results Two-hundred CRS cases with a history of bilateral FESS were retrospectively reviewed. Thirty-eight (19.0%) patients developed synechiae within an average of 60.9±57.8 days post-FESS. Individuals receiving primary sinus surgery and nasal septal reconstruction were strongly associated with the development of post-operative synechiae (OR: 4.5, 95% CI: 1.6,13.0; OR: 4.4, 95% CI: 1.4,13.8). Subject demographics and preoperative factors such as gender, age, nasal polyposis, Lund-Mackay CT score and endoscopic evidence of concha bullosa were not associated with the development of post-operative synechiae.

Conclusions Patients undergoing primary FESS and nasal septal reconstruction are at greater odds of developing synechiae than those having revision surgery and thus, warrant careful postoperative evaluation. Possible methods of preventing synechiae formation in this population should be evaluated in future studies.

214 COEXISTING CLEAR CELL RENAL CELL CARCINOMA AND SOLITARY EXTRAMEDULLARY PLASMACYTOMA

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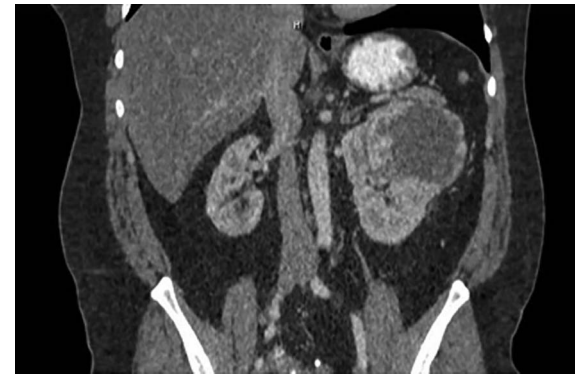
10.1136/jim-d-15-00013.214

Case Report Renal solitary extramedullary plasmacytomas are rare plasma cell neoplasms. We report a patient with coexisting extramedullary plasmacytoma and clear cell renal cell carcinoma with 22 month follow-up.

A 51 year old male presented with gross hematuria. Follow-up CT imaging (Image 1) revealed an 8 cm left renal mass. A fine needle biopsy found monoclonal plasma cell proliferation and serum protein electrophoresis showed monoclonal expansion of a small IgG, leading to work-up



Abstract 214 Figure 1 Coronal CT with 8 cm upper pole renal massCoronal CT with 8 cm upper pole renal mass.

for multiple myeloma. PET/CT imaging, bone marrow biopsy, peripheral blood smear, and cytogenetics were consistent with a solitary extramedullary plasmacytoma.

He subsequently underwent an open left partial nephrectomy and discharged with no complications. The resected mass had negative surgical margins, a largest diameter of 8 cm and was not spread past the capsule.

Tumor histology was conducted with hemotoxylin and eosin staining. The tumor pathology revealed a Fuhrman grade 2 clear cell renal cell carcinoma with intermingled plasma cell proliferation. The plasma cell nodules were found to be monocolonal lambda immunglogulin light chain producing cells. Overall, the findings are compatible with coexistence of plasmacytoma and clear cell renal cell carcinoma, pT2a pathological staging.

At 22 month follow up the patient has no evidence of disease and is without complication. Renal function tests are unchanged from baseline.

To our knowledge, this is the first reported case of coexisting plasmacytoma and renal cell carcinoma. The report calls into question pre-surgical renal mass biopsy protocol and suggests a relationship between renal cell carcinoma and plasma cell neoplasms.

215 QUALITATIVE INTERVIEWS WITH PARENTS OF YOUNG CHILDREN WITH CLEFT LIP AND PALATE

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10.1136/jim-d-15-00013.215

Purpose of Study Diagnosis of children with cleft lip and palate occurs antenatally or at birth. This condition impacts aesthetics, feeding and speech. Diagnosis portends a series of medical interventions extending from infancy into adult life. Patient-reported outcomes have been explored in older children with clefts, but the experience of parents of younger children has not previously been studied. The aim of this study was to better understand the experiences, challenges and adaptations of parents with children who have cleft lip and/or palate.

Methods Used In-depth semi-structured interviews with parents of children aged 0–7 years with cleft lip and/or

palate. Interviews were recorded, transcribed, and analyzed using NVivo software. Analysis was by open coding of transcripts. Emergent themes were organized into a conceptual framework. Key strategies to improve care were identified.

Summary of Results From 14 interviews, 5 themes were identified. *Diagnosis* was associated with feelings of guilt, sadness, worry for the child's future, and protective instincts. *Physiology and function* was an early concern for parents, with early worry focused on feeding, transitioning to speech. *Social interaction* inlcuded parents' attempts to help their children deal with comments from others. Frustration with attitudes of the wider community was expressed. Many described a feeling of isolation and wished to have the support of other parents. *Experience of healthcare* was discussed, largely in a positive light. Qualities praised in healthcare staff were compassion, empathy, confidence, competence and continuity of care. Parents' *personal emotions* included coping strategies such as hiding their child or avoiding encounters with strangers; preparing short answers to curious passers-by; minimising the problem and a refusal to let their child be defined by the condition.

Conclusions Parents of children with cleft lip and/or palate experience many emotions. Awareness is the first step for clinicians to more fully support parents in their journey. Steps to optimizing care include improving parents' access to good information, nurturing a caring attitude in health professionals and developing a peer support network. Parents were overwhelmingly keen to share their experiences in the hope of improving the experience for future families.

216 A RETROSPECTIVE REVIEW OF TEMPOROMANDIBULAR JOINT RECONSTRUCTION WITH AUTOGENOUS COSTOCHONDRAL ARTHROPLASTY

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10.1136/jim-d-15-00013.216

Purpose of Study Ankylosis, chronic inflammation and trauma to the temporomandibular joint (TMJ) can significantly impair speech, diet, and quality of life. Surgical reconstruction by costochondral arthroplasty (CCA) may improve function and relieve pain for patients. This study aims to review one Canadian plastic surgeon's experience with CCA and investigate indications, outcomes, and complication rates.

Methods Used We retrospectively reviewed all patients who underwent a primary CCA from 1991–2012. Data collection included: patient demographics, diagnosis, previous TMJ surgeries, inter-incisal opening (IIO), pain, and diet.

Summary of Results 39 patients (32 female) underwent a primary CCA for TMJ reconstruction. 35 were unilateral and 4 bilateral. To reduce pain or improve jaw opening, 15 patients required one or more additional operations to the reconstructed joint at an average of 2.5 years. In 9 patients, the costochondral grafts were eventually completely replaced after an average of 5.9 years; 5 had a second CCA while 4 received total implant arthroplasties. 17 patients did not undergo any additional surgery for the TMJ and received followed-ups for an average of 3.6 years (41 days–12 years).

Pre-operative IIO was 27mm +/–10 mm. Post-operative IIO data was not available for 7 patients. Maximal IIO (30mm +/–6mm) was measured 171 days post-operatively on average with a change of 2 mm +/–7mm. 18/32 (56%) patients found improvement in IIO.

All patients who underwent CCA were previously experiencing pain. After surgery, pain decreased for 20/37 (54%) patients, remained the same for 16/37 (43%) and 1 had increased pain. Regarding diet, 10/25 (40%) patients either gained the ability to eat soft foods or were able to eat harder or chewier foods; 15/25 had no change of diet. Diet data was unavailable for 10 patients.

Conclusions CCAs can reduce pain, improve one's ability to eat, and increase mandibular range of motion for patients with TMJ pain and dysfunction. The long-term outcome of CCA remains variable and deserves further study.

217 ROBOTIC SIMULATOR SKILLS: IMPACT OF DIFFERENT BACKGROUND AUDITORY ENVIRONMENTS ON LEARNING CURVE OF NOVICE SURGEONS

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10.1136/jim-d-15-00013.217

Purpose of Study Our group studied the influence of background auditory environments on the acquisition of robotic surgical skills by novice surgeons.

Methods Used 53 Loma Linda University School of Medicine students were randomized to a background auditory environment with either no additional background noise, classical music, or death metal accompanied by recorded conversations. The da Vinci Si Surgical System and Surgical Skills Simulator (Intuitive Surgical, Inc., Sunnyvale, CA) were used to assess and measure student learning. Students performed three trials each of Energy Dissection 3 and Suture Sponge 3 in their respective background auditory environments. The Surgical Skills Simulator provided scores.

Summary of Results For Energy Dissection 3, the average overall scores of trials 1, 2, and 3 in the auditory environment with no additional background noise were 68.6, 76.1, and 76.4, respectively. Students in the classical music environment on average scored 57, 70.3, and 77.7, while those exposed to death metal and conversational distractions on average scored 63.2, 76.8, and 80.1.

For Suture Sponge 3, no additional background noise resulted in average overall scores of 39, 49.3, and 58.3 for trials 1, 2, and 3, respectively, whereas the classical music environment showed average overall scores of 32.7, 45, and 49.6. Students subjected to death metal and conversational distractions on average scored 39.2, 47.5, and 52.5.

For both Energy Dissection 3 and Suture Sponge 3, scores were out of a maximum of 100.

Conclusions While there is reason to believe that background auditory environments do impact the acquisition of robotic surgical skills by novice surgeons, statistical analysis is needed before drawing further conclusions.

Abstract 217 Table 1 # of Passing Scores (80+) for Energy Dissection 3

	Trial 1	Trial 2	Trial 3
No additional background music	1	6	7
Classical music	0	5	9
Death metal accompanied by conversational distractions	1	8	11

218 ENHANCING THE QUALITY OF THE CHILD AND FAMILY SURGICAL EXPERIENCE WITH TELEHEALTH

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10.1136/jim-d-15-00013.218

Purpose of Study Access to specialized child health services is critical to population health. In the province of British Columbia (population 4.6M, land area 365,000 mi^2), BC Children's Hospital (BCCH) is the sole tertiary care center for children. Consequently, geographically remote families must travel great distances to visit with a pediatric specialist; this travel often results in lost time and considerable expense for these families. In an effort to improve access to healthcare for remote/rural children and their families, BCCH began offering Telehealth as an alternative to in person appointments for select new patient and follow-up consultations.
Methods Used A comprehensive literature search was performed in order to define current state for surgical Telehealth in other jurisdictions—especially with respect to pediatric surgery—which helped inform technology and patient selection and the early clinical experience. Satisfaction questionnaires from patients, clinical support staff, and health care providers were analyzed to determine the effectiveness of Telehealth consultations. Surgical wound photographs were collected and assessed in an attempt to measure inter-observer reliability, and validate a protocol for post-operative wound assessment by Telehealth.
Summary of Results The analysis of 23 patient questionnaires in this pilot study showed high patient satisfaction with the surgical Telehealth service; 100% of patients (and their families) indicated that they would use this service again. If Telehealth had not been offered, patients would have had to travel an average of 5.4 hours longer to attend their appointment. The child's perception of their consultation compared to that of an in-person examination. The technique used for wound assessment by Telehealth offered an equivalent outcome to an in-person assessment.
Conclusions Advances in technology have made it possible to improve access to healthcare by way of tools like Telehealth; technology can effectively connect patients to practitioners, despite great distances between the two. High levels of patient and provider satisfaction in this study indicate the potential of Telehealth to improve patient outcomes and experience when applied to children's surgical care.

219 DETECTION OF ABNORMALLY SHAPED EARS IN NEWBORNS

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10.1136/jim-d-15-00013.219

Purpose of Study Many children are born with abnormally shaped ears, including protruding ears or oddly shaped outer ears. While the majority of abnormally shaped ears are benign, they can cause significant issues with self-esteem and bullying. Molding with soft splints or tape can resolve some of these abnormalities and avoid the need for future corrective surgery. However, newborns with these abnormalities are rarely identified early, within the first few days of life, when molding is most effective. In this study, we investigate whether a trained non-specialist can correctly identify ear abnormalities in newborns.
Methods Used A non-specialist (medical student) was trained on normal and abnormal ear anatomy using photographs and descriptions. Newborns within 72 hours of age were recruited from the maternity wards at BC Women's Hospital. Newborns' ears were photographed and each photograph was assessed by a specialist and the non-specialist. Ears were classified as either normal or abnormal.
Summary of Results A total of 661 ears were photographed and assessed. High inter-rater agreement on ear abnormality classification was achieved in both double-blinded and non-blinded assessments with a kappa statistic of 0.863 (SE 0.078) and 0.892 (SE 0.044), respectively.
Conclusions Our study illustrates that a trained non-specialist can accurately detect newborn ear abnormalities, providing a cost-effective means of ensuring that these children's health care needs are met in a timely fashion. Specifically, this study illustrates the potential for integrating assessment of ear shape into currently established programs such as the BC newborn hearing screening program.

220 EMOTIONAL CONCERNS IN SURGICAL CANCER SURVIVORS NOT TREATED WITH CHEMOTHERAPY

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Purpose of Study Emotional concerns can impact quality of life in all cancer (CA) survivors [CS] treated with surgery, regardless of receipt of chemotherapy.
Methods Used Surgically treated CS not treated with

chemotherapy were identified in the 2010 LiveStrong Survey. Only patients that responded to all 9 categories of emotional concern questions were included (energy/fatigue, depression and mood, identity and grief/guilt, faith and spirituality, fear of recurrence, social anxiety, shame, concern for family, insecurity). A total emotional concern score was calculated (0–9) and independent t-tests or ANOVA identified factors that impacted total score. After stratification by CA type, linear regression determined which factors, if any, were important predictors of having more emotional concerns.

Summary of Results Of 649 CS, most were white (91.0%), insured (97.8%), employed/student (79.3%), married/domestic partner (76.2%), and had survived at least 5 years (69.8%); many were > 40 years old (62.8%). The median number of reported emotional concerns was 4 (mean 4.3, SD 2.0) with 3.1% of patients reporting no concerns. Patients with brain or head/neck CAs had the highest scores (5.3, SD 1.5–1.7), whereas those with other endocrine tumors or melanoma had the lowest scores (3.9, SD 2.0–2.1), ($p=0.001$). Additionally, age<40 at diagnosis, female gender, being employed, uninsured, having less education, and having received radiation (RT), hormone (HT), or other additional therapy all increased the emotional concern score ($p<0.05$); race/ethnicity, marital status, and income did not impact the score. After stratification by CA type, only the following increased emotional concerns: receipt of HT for breast CA (B=0.30), being employed (B=0.82) or retired (B=0.41) for thyroid CA, female gender (B=0.51) or receiving RT (B=0.38) for bone/soft tissue CA, age<40 (B=0.37) and receipt of other/HT (B=0.31) for melanoma, and female gender for (B=0.76) for other endocrine tumors.

Conclusions Significant emotional concerns are reported by surgically treated cancer survivors not treated with chemotherapy. These concerns are most influenced by cancer type and treatment, but not race/ethnicity, marital status, or income.

221 THE EFFECT OF LASER FIBER STRIPPING ON FRAGMENTATION OF URINARY TRACT CALCULI

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Purpose of Study The holmium:yttrium-aluminum garnet (Ho:YAG) laser has become the gold standard for lithotripsy of urinary tract calculi. Its ability to fragment stones depends on close contact between the fiber tip and the stone surface. In current surgical practice, the reusable laser fiber is cleaved with a specialized tool and stripped of its plastic outer jacket between uses. Recently, the necessity of the stripping step has been put into question. The purpose of this study was to investigate the effect of laser fiber stripping on stone fragmentation.

Methods Used In a benchtop simulation of laser lithotripsy, 20 artificial BegoStone phantoms were constrained within a ureteral model and irradiated for 10 minutes each with a Ho:YAG laser (8 Hz and 0.8 J) and a 365 μm fiber, either cleaved and stripped or simply cleaved alone. In a single-blinded fashion, final masses of residual stone fragments were measured and used to quantify stone breakdown, normalized to initial stone mass. Independent-samples Mann-Whitney U tests were performed with significance set at $p<0.05$, comparing stripped and unstripped fiber tips with respect to normalized fraction of stone fragmentation.

Summary of Results Stripped laser fibers achieved significantly increased stone breakdown, exhibiting an average 22% greater fraction of stone fragmentation, relative to unstripped fibers ($p<0.01$).

Conclusions Stripped laser fibers performed better stone breakdown than unstripped fibers over 10 minutes of irradiation.

222 EFFECTIVE NON-OPERATIVE MANAGEMENT OF SEVERE BLUNT LIVER TRAUMA

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Purpose of Study Liver injury is common after blunt trauma and, with increasing severity of injury, accounts for significant morbidity in the trauma population. Although there has been a shift from primarily operative to largely non-operative management (NOM) of these injuries over the past decades, a standardized and optimal approach to doing this has not been established. Specifically, it is unknown which injuries tend to fail NOM and what the long-term outcomes of NOM of severe injuries are. We are performing this study to find the subset of patients that fail NOM and to identify patients that tend to be high resource utilizers among liver trauma patients (i.e. those with long length of stay, high numbers of procedures performed, and high cost of hospitalization).

Methods Used A retrospective review of all trauma patients admitted to our level 1 trauma center with blunt liver injury between 2011 and 2014. Data sources included direct chart review, institutional trauma registry, and institutional financial records. Logistic and linear regression analyses were performed to evaluate the outcomes of in-hospital mortality, length of stay, number of inpatient procedures, hospitalization cost, and discharge status. Statistical analyses were performed using JMP 11.0 software (SAS International Inc., Cary NC).

Summary of Results There were 589 trauma patients included in the study, 468 (79.5%) of which were treated with NOM initially, 15 (3.3%) of which failed NOM (fNOM), defined by surgical intervention at least one day after admission, none of which died as a result. The fNOM group averaged 32.8 days with drains placed around the liver compared to the operative patients average of 19.5 days. Compared to the NOM group, the fNOM group showed significantly higher ISS scores, hospital length of stay, total number of procedures, and total cost of admission, but were still far less than the operative group in every category excluding duration of drains, averaging 3.4 less hospital days, 7.2 less procedures, and saving an average of $20,997 in total costs.

Conclusions Patients with severe liver trauma continue to

be difficult cases for surgeons to manage. Failed NOM management may result in further morbidity and surgical intervention, but it still beats operative management every time.

223 FRAILTY PREDICTS POSTOPERATIVE MORBIDITY/ MORTALITY AFTER COLECTOMY FOR C-DIFFICILE COLITIS

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Purpose of Study The purpose of this study is to evaluate the association between modified frailty index (mFI), as a measure of frailty, and postoperative outcomes after colectomy for patient presenting with fulminant CDI. Frailty is a multidimensional syndrome that encompasses diminishing nutritional and energy status, physical ability, cognition and overall health of a patient. A modified frailty index calculated on the basis of several variables is already used to predict outcomes in many surgical procedures done on elderly patients. Given that age >65 is among the most important risk factors for developing CDI, we hypothesize that a multivariable index of frailty can serve as a robust independent predictor of postoperative morbidity and mortality in patients at greatest risk of developing complicated CDI.

Methods Used NSQIP cross-institutional database was used for this study. Data from 483 patients with a diagnosis of C. difficile colitis was used in the study. 73.71% underwent total (n=356) and 26.29% partial (n=127) colectomies. Modified frailty index (mFI) is a previously described and validated 11-variable frailty measure used with NSQIP to assess frailty. Outcome measures included serious morbidity, overall morbidity, Clavien IV (requiring ICU), and Clavien V (mortality) complications.

Summary of Results Median age was 70 years, and BMI was 26.9Kg/m^2. 44.4% of patients were males. 98.6% of patients were assigned ASA Class 3 or higher. The median mFI was 0.27 (0–0.63). As mFI increased from 0 (non-frail) to 0.36 and above, the overall morbidity and increased from 53.3% to 88.1% and serious morbidity increased from 43.3% to 76.1%, respectively. The Clavien IV complications rate increased from 30.0% to 73.9%. Mortality rate has increased from 6.7% to 46.3%. All results were statistically significant at $p<0.01$. On a multivariate analysis mFI was independent predictor of overall morbidity (AOR: 12.4, $p<0.05$) and mortality (AOR: 8.3, $p<0.05$).

Conclusions Frailty is associated with increased risk of complications in C. difficile colitis patients undergoing colectomy. The mFI is an easy to use tool and can play an important role in the risk stratification of these patients, who generally have significant morbidity and mortality to begin with.

224 FRAILTY IS A PREDICTOR OF POSTOPERATIVE MORBIDITY AND MORTALITY AFTER COLECTOMY FOR CANCER

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Purpose of Study Colorectal cancer is the third most common cancer in men and women in the US and is the second leading cause of cancer death in both sexes. Colectomies play an important role as a treatment option for people with colorectal malignancy. Frailty has been noted as a powerful predictive preoperative tool for 30-day postoperative complications.

Methods Used The NSQIP participant use file was queried to identify 26,314 patients with malignant colorectal neoplasm. 52.29% underwent laparoscopic (n=12,555) and 47.71% open (n=13,759) colectomies. A previously described and validated modified frailty index (mFI) was calculated on the basis of NSQIP variables. Our primary outcomes were overall morbidity, Clavien class IV (requiring critical care support) and Clavien class V (mortality) complications.

Summary of Results Median age was 69 years, and BMI was 27.0 Kg/m^2. 50.3% of patients were males. 56.0% of patients were ASA Class 3 or higher. The median mFI was 0.09 (0–0.73). As mFI increased from 0 (non-frail) to 0.36 and above, the overall morbidity increased from 14.6% to 39.3% ($p<0.01$) and serious morbidity increased from 6.8% to 22.8% ($p<0.01$), respectively. The Clavien IV complications rate increased from 2.4% to 16.8% and the mortality rate increased from 0.7% to 7.8%, respectively ($p<0.01$). On multivariate analysis mFI was independent predictor of serious morbidity (Adjusted Odd Ratio (AOR): 6.2, $p<0.01$), overall morbidity (AOR: 5.0, $p<0.01$), Clavien IV complication rates (AOR: 13.0, $p<0.01$) and mortality (AOR: 4.4, $p<0.01$).

Conclusions A simplified frailty index, obtained by easily identifiable patient characteristics, significantly predicts morbidity and mortality after colectomy for cancer. Assessment of frailty may facilitate perioperative risk stratification, as well as help identify and counsel high-risk patients.

225 FEASIBILITY OF IMPLEMENTING CHLORHEXIDINE GLUCONATE (CHG) FOR PRE-OPERATIVE CLEANSING IN PEDIATRICS

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Purpose of Study 2% Chlorhexidine Gluconate (CHG) wipes have been shown to significantly reduce SSI rates in adult populations. The purpose of this study is to determine the feasibility of implementing these CHG wipes

within the Surgical Day Care Unit (SDCU) as pre-operative skin cleansing agents.

Methods Used Patients were sampled from a selection of surgeons who agreed to participate in the study. Targets of this study included high risk surgical patients, excluding those undergoing head, neck or spine surgery, with skin conditions, and patients whose parents feel uncomfortable using wipes. Areas for determining feasibility include the workload burden on SDCU nurses as well as caregiver/patient satisfaction with the product.

Surveys were created for caregivers and nurses to complete. Nurses received prior teaching sessions and education materials. Educational materials were available for parents in SDCU.

Summary of Results A total of 27 parent surveys were completed and all stated that the wipes were 'very easy' or 'easy' to use.' 81% of parents reported that their child felt 'warm' and 'relaxed.' All parents stated that the process of using the wipes went smoothly and that they would use them in the future. 44% of parents reported some negatives associated with the wipes, such as the patient feeling 'sticky' after using the wipes and that the wipes were 'smelly'.

The results of 6 nurse surveys indicated that the use of CHG wipes preoperatively resulted in either no impact or neutral impact on their workload in the SDCU and that there were no adverse patient reactions.

Conclusions Parents reported that the wipes are easy to use and that they would use them again in the future. Nurses reached a consensus in that the wipes leave no impact on their workload.

Joint Plenary Session
WAFMR, WSCI, WAP AND WSPR
8:00 AM
Friday, January 29, 2016

226 DEFAULT MODE NETWORK ACTIVITY: TESTING FOR ASSOCIATION WITH EXTERNALIZING BEHAVIOR PROBLEMS WITH AND WITHOUT CALLOUS UNEMOTIONAL TRAITS

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Purpose of Study Adolescents with externalizing behavior problems (conduct disorder (CD) and substance use disorders (SUD)) are a source of large social and economic costs. Such adolescents sometimes display high levels of callous-unemotional (CU) traits and recent work supports that the presence of CU identifies a distinct subgroup of youths with CD. We sought to test whether activity of the default mode network (DMN), a functional brain network involved in self-reflective thought, empathy, and foresight, is associated with these disorders.

Methods Used We collected 6 minutes of resting state functional magnetic resonance imaging for 20 patients with CD/SUD and CU, 21 patients with CD/SUD without CU, and 22 controls (all males 14–18 years). We used independent component analysis, a data-driven approach, to identify networks (i.e., clusters of voxels which activate together across time). We then utilized a standard template and spatial correlation to select the DMN. We tested: (1) whether the 3 groups differed significantly in DMN activity, (2) whether DMN activity was associated with severity of externalizing behavior problems within patients, and (3) whether DMN activity was associated with CU trait severity within patients.

Summary of Results Three-group comparisons revealed differences in one cluster including portions of the posterior cingulate cortex (PCC) and precuneus (Brodmann area (BA) 31). Subsequent two-group comparisons showed that both patient groups had significantly less activation in this cluster compared with controls. Our within-patient analysis showed that severity of externalizing behavior problems was negatively associated with activity of a cluster in the ventral and dorsal anterior cingulate areas (BA24/32), and positively associated with activity in a cluster within the PCC. Finally, within patients, severity of CU traits was negatively associated with activity in a cluster of the inferior parietal lobule (BA40).

Conclusions While both patient groups, regardless of CU, showed less activity in the DMN (BA31), higher levels of CU trait were associated with a distinct pattern of hypo-activity within patients. Further investigation may lead to better treatment of these disorders.

227 INFLAMMATORY PROSTAGLANDIN E2 INHIBITS OLIGODENDROCYTE PROGENITOR CELL MATURATION: MECHANISM FOR NEONATAL WHITE MATTER INJURY

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10.1136/jim-d-15-00013.227

Purpose of Study White matter injury (WMI) in the extremely low birth weight (ELBW) brain predicts development of cerebral palsy (CP) and other neurodevelopmental deficits. WMI, a disturbance in myelination, features maturation arrested oligodendrocyte progenitor cells (OPCs). Risk factors for WMI and CP include systemic inflammation, but the mechanism linking systemic inflammation to OPC maturation arrest is not understood. Studies show that prolonged Indomethacin exposure protects ELBW infants from WMI. Because indomethacin is an anti-inflammatory COX inhibitor, we hypothesized that inflammatory Prostaglandin E2 (PGE2) - a major product of COX enzymes - can arrest OPC maturation.

Methods Used Primary OPCs were purified from mouse pups by immunopanning and differentiated in the presence of vehicle or PGE2. Cells were stained for mature marker MBP and immature marker Nk×2.2. Cells were also collected for qPCR analysis of receptor expression. Studies were also conducted with OPCs purified from EP1-receptor-deficient pups and littermate controls.

Summary of Results PGE2 caused a dose-dependent decrease in MBP staining of differentiating cells (Figure 1AB). Cells also had increased levels of Nk×2.2 (Figure 1C), consistent with maturation blockade. OPCs predominantly express the EP1 receptor (Figure 1D), and