Adolescent Medicine and General Pediatrics III
Concurrent Session
8:00 AM
Saturday, January 30, 2016

378 A CLOSE LOOK AT THE USE OF HYPERTONIC SALINE AND HIGH FLOW OXYGEN IN PEDIATRIC PATIENTS HOSPITALIZED WITH RESPIRATORY SYNCYTIAL VIRUS

C Mercurio,[1] J Green,[2,1] B Afghani[1,2]. [1]*UC Irvine, Irvine, CA;* [2]*Children's Hospital of Orange County, Orange, CA*

10.1136/jim-d-15-00013.378

Purpose of Study Use of hypertonic saline (HS) and high flow nasal cannula oxygen (HFNC) has become more prevalent in pediatric patients hospitalized with espiratory syncytial virus (RSV). However, published literature on their use is limited. The objective of our study is review the use of hypertonic saline and high flow oxygen in infants hospitalized with RSV.

Methods Used We performed a retrospective chart review of pediatric patients less <1 year of age who were hospitalized at Children's Hospital of Orange County during the 2013–14 RSV season with a diagnosis of RSV. We documented the management regimen, with a particular look at the use of HS and HFNC. 165 patients less <1 year of age fulfilled our inclusion criteria. 6 patients were omitted from data analysis due to incomplete outside records.

Summary of Results For patients <2 months of age, 9 (53%) of 17 with underlying conditions vs. 39 (66%) of 59 patients without underlying conditions required HS (P=0.3956). Although it didn't meet statistical significance, it seems that the use of HFNC tended to be more frequent in patients <2 months of age with underlying conditions (29% vs. 10%, P=0.062). Use of HFNC or HS was not different for those >2 months of age with or without underlying conditions. The mean length of stay (LOS) for different types of treatment is summarized in the table below.

Conclusions Our study shows that the use of HFNC tended to be more frequent in young infants with an underlying condition. The use of HFNC or HS was associated with longer LOS. Large prospective studies that take into account severity of illness, underlying conditions and differing protocols for use of HFNC and HS are needed to prove their effectiveness.

Abstract 378 Table 1 Comparing the average LOS for patients receiving HS or HFNC

	HS		No HS			HFNC		No HFNC		
	# Patients	Mean LOS (days)	# Patients	Mean LOS (days)	P value	# Patients	Mean LOS (days)	# Patients	Mean LOS (days)	P value
≤2 months old	28 (37%)	6.65	48 (63%)	1.91	0.0033	11 (14%)	12,81	65 (86%)	2.11	0.0001
>2 months old	35 (42%)	4.27	48 (58%)	2.36	0.0030	20 (24%)	6.27	63 (76%)	2.18	0.0001

379 COMPARING THE HABITS AND GOALS OF UNDERPREVILEGED AND PRIVILEDGED YOUTH

K Nikroo. *UC Irvine School of Medicine, Irvine, CA*

10.1136/jim-d-15-00013.379

Purpose of Study In the age of social media, it is important to characterize factors contributing to youth success. In this study we try to compare the hopes and different habits among privileged and underprivileged high school students.

Methods Used A survey was distributed to high school who participated in Health and Science enrichment Program at UC Irvine, California during the summer of 2014 and 2015. The survey asked about the demographics of the participants, some of their habits, and their future hopes.

Summary of Results Of the student participants, 33 belonged to the underprivileged and 122 belonged to the

Abstract 379 Table 1

	Underprivileged (n=33)	Privileged (n=122)	P Value
Gender F:M	27F: 6M	65F: 57M	0.003
Role Model Family Member	22/27 (81%)	57/104 (55%)	0.015
Hours of Sleep/Day			
≤6 hours	18/33 (55%)	59/121 (49%)	NS*
>6 hours	15/33 (45%)	62/121 (51%)	
Social Media (hours/day)			
<2 hours	16/33 (49%)	50/117 (43%)	NS
≥2 hours	17/33 (51%)	67/117 (57%)	NS

*NS=Not Significant.

privileged group. All students had a goal of entering a science or health related career. As the requirement to enroll in the program was a GPA of >3.5 (out of 5), there was no significant difference in GPA of the privileged and underprivileged students. The characteristics of the participants are summarized in table below. When comparing the gender ratios, underserved females were more likely to participate in the program compared to their male counterparts. More than half of the respondents reported that they spend more than 2 hours/day on social media. There was not a significant difference in terms of the hours spent on social media or hours of sleep when comparing the two groups. When asked about their role models, underprivileged were more likely to choose a relative compared to the privileged group.

Conclusions High school students spend a significant amount of time (>2 hours/day) on social media. Our sample size may have been too small to show significant differences among the habits of underprivileged and privileged students but underprivileged students were more likely to choose a relative as a role model. Long term follow-up studies, including larger number of participants are in progress to find the association between different habits of students and their educational success.

380 THE VALUE OF THROMBOPROPHYLAXIS IN PEDIATRIC CANCER PATIENTS WITH CENTRAL VENOUS CATHETERS (CVC): A CLOSER LOOK AT THE LITERATURE

F Aguirre,[1] L Sekiguchi,[1] KJ Yeung,[1] M Alcayde,[1] J Epstein,[1] N Chintalapati,[1] A Le,[1] A Mehta,[1] B Afghani[1,2]. [1]*University of California, Irvine, Irvine, CA;* [2]*CHOC Children's, Orange, CA*

10.1136/jim-d-15-00013.380

Purpose of Study Pediatric cancer patients undergoing chemotherapy are at increased risk of venous thromboembolism (VTE). The objective of this study is to determine whether primary thromboprophylaxis lowers the risk of VTE in pediatric cancer patients with central venous catheters.

Methods Used A literature based review through PubMed and Cochrane databases using key terms such as: VTE, cancer, pediatrics, CVC, prophylaxis, anti-coagulant. Studies which included cancer patients <18 years of age with central-venous catheters and no history of VTE as well as a control group were included in our review.

Summary of Results From the 38 articles we found 4 that met our inclusion criteria. Majority of the studies excluded focused on adults or did not include a control group. Table below summarizes the effectiveness of thromboprophylaxis and major side effects. The risk of VTE was lower in 2 studies that used low molecular weight (LMWH) as part of prophylaxis but one study that used LMWH did not show any difference between the prophylaxis and control group.

Conclusions There may be a role of anti-coagulants for prophylaxis of VTE in pediatric cancer patients with CVCs, but large prospective controlled studies are needed to confirm the effectiveness. It is also important to take into account other confounding variables, safety as well as cost-effectiveness of thromboprophylaxis in such patients.

Abstract 380 Table 1

1st author, year	Control	Prophylaxis Group	% of VTE in Anticoag	% VTE in control	P value	Any other serious side-effects of anticoagulant drugs	Was patient discontinued due to side effects	Duration on prophylaxis	Follow-up period
Ruud, 2007	No prophylaxis (n=33)	warfarin (n=29)	14/29 (48%)	12/33 (36%)	p=0.44	Most thrombi were transient	yes (n=11)	>6 mos	1,3,6 mos
Elhasid, 2001	Matched historical controls (n=50)	LMWH (n=27)	1/41 (2.4%)	2/50 (10%)	p<0.05	1 patient LMWH had brain infarct	no	6 mos	1,3,6 mos
Massicottea, 2003	No prophylaxis (n=80)	LMWH (n=92)	11/78 (14.1%)	10/80 (12.5%)	p=0.41	Bleeding, 2 deaths in control	no; 15%(n=28) were not evaluable	30 days	2 weeks
Meister, 2008	Historical controls who got Antithrombin only (n=71)	LMWH and Antithrombin (n=41)	0/41 (0%)	9/71 (12.7%)	p=0.02	no	no	45 days	240 days

381 EFFECTS OF RISPERIDONE USE IN PEDIATRIC POPULATION WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

AJ Garcia,[1,2] N Kim,[2] J Chang,[2] S Ravikumar,[2] A Morehouse,[2] A Sidhu,[2] A Lee,[2] B Afghani[2,3]. [1]*University of California, Los Angeles, Los Angeles, CA;* [2]*UC Irvine, Irvine, CA;* [3]*CHOC Children's Hospital, Orange, CA*

10.1136/jim-d-15-00013.381

Purpose of Study The use of antipsychotics in pediatric patients with ADHD has been a subject of debate. The objective of this study was to summarize the benefits and side effects of treatment with risperidone in pediatric patients with ADHD.

Methods Used A literature review was conducted utilizing PubMed and Google Scholar databases using the following search terms: ADHD, attention deficit, hyperactivity, children, pediatrics, risperidone, and antipsychotic. Studies that involved patients > 18 years of age were excluded from our analysis. Only studies that reported the effectiveness as well as the side effects of risperidone were included in this review.

Summary of Results We found 5 studies that met our inclusion criteria. The studies were all prospective and included mostly school children. The average length of the risperidone treatment was 6 to 8 weeks with the exception of one study which provided 2 years of treatment. All but one study included ADHD patients who had aggressive behaviors or psychosis. The studies were mostly based on parental questionnaires and showed improvement of symptoms during the study period. Majority of studies reported side effects, such as weight gain, daytime drowsiness, and somnolence during treatment with risperidone. The monitoring of the side effects was limited to the duration of the study.

Conclusions The studies showed that risperidone improved the symptoms of ADHD patients with aggression or psychosis on a short-term basis. However, none of the studies conducted long term follow-up. Further studies are needed to evaluate the long-term benefits and side effects, such as adverse effect on the developing brain as well as long term metabolic side effects.

382 COMMUNITY ACQUIRED-METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (CA-MRSA) INDUCED NECK ABSCESS ASSOCIATED WITH STRIDOR IN A 2-MONTH-OLD INFANT

BH Hammond, H Agarwal. *University of New Mexico, Albuquerque, NM*

10.1136/jim-d-15-00013.382

Background Staphylococcus aureus and Streptococcus pyogenes account for 40–80% of pediatric neck abscesses. CA-MRSA associated neck abscesses are on the rise with the median age of presentation ranging from 7 months to 3 years. We report a case of CA-MRSA induced neck abscess in a 2-month-old infant.

Case Report A 2-month-old previously healthy male infant born at full term via vaginal delivery and on formula feeds presented to the emergency department for neck swelling, subjective fever and squeaky breathing. His examination revealed 37.8°C temperature, mild tachypnea, unilateral submandibular neck swelling, and inspiratory and expiratory stridor. His studies revealed elevated white cell count of 27000 with 64% neutrophils, normal chest X-ray, normal airways on bedside nasal endoscopy evaluation and 4.8×3.7 cm multi-cystic mass in his right neck with lateral deviation of his trachea on CT scan of his neck. He was empirically started on ampicllin-sulbactam and underwent emergent surgical resection that revealed 2 cc of purulent fluid from a multi-cystic abscess. Following his surgery, his stridor improved. His white cell count dropped to 10400 and his CRP reduced from 4.7 to 0.5. The abscess fluid culture revealed methicillin-resistant Staphylococcus aureus (MRSA) and his antibiotic therapy was changed to vancomycin that was transitioned to oral clindamycin at time of discharge.

Discussion There has been an increase in CA-MRSA acquired skin and soft tissue infections including suppurative adenitis and neck abscesses in children. There are no specific risk factors that can predict methicillin resistance in pediatric neck abscesses. Stridor is an unusual clinical presentation with neck swelling, fever and decreased oral intake being more common. Antibiogram studies of Staph aureus at our institution in 2014 revealed 38% resistance

Abstract 381 Table 1

Reference	# Patients	Age of Patients	Use of Control (Y or N)	What Type of Patients	Outcome	Adverse Effects	Duration of Study	Medications Tried Before Risperidone
Aman, 2004	155	4-11 years old	Y	ADHD and aggressive behaviors	Improved	Somnolence, weight gain, headache, dyspepsia	6 weeks	Psychostimulants
Biederman, 2008	31	4-15 years old	N	ADHD and psychosis	Improved	Headache, weight gain, sedation, common cold	8 weeks	Psychostimulants
Arabgol, 2015	33	3–6 years old	N	ADHD only	Improved	Daytime drowsiness and loss of appetite	6 weeks	None
Eapen, 2005	12	4–14 years old	N	ADHD and aggressive behaviors	Improved	Tiredness, sedation, weight gain	2 years	None
Gadow, 2014	168	6–12 years old	Y	ADHD and aggressive behaviors	Improved	Not reported	8 weeks	Not reported

to methicillin. They were 100% susceptible to vancomycin, although 11% were resistant to clindamycin. Given the prevalence of MRSA even in this age population, additional treatment with clindamycin or trimethoprim/ sulfamethoxazole for CA-MRSA coverage must be considered for initial treatment of pediatric neck abscesses in infants.

383 DIETARY INTAKES AND GROWTH PATTERNS IN FORMULA-FED INFANTS CONSUMING A MEAT OR DAIRY-BASED COMPLEMENTARY DIET

KE Griese,[2] M Tang,[2] NF Krebs,[2] AE Hendricks[1]. [1]*University of Colorado, Aurora, CO;* [2]*University of Colorado Denver School of Medicine, Aurora, CO*

10.1136/jim-d-15-00013.383

Purpose of Study Compare meat vs. dairy as complementary foods on dietary intake and growth in formula 6 to 12 mon formula fed infants.

Methods Used Healthy, term formula-fed infants were randomized to a meat-protein diet group (M) or dairy-protein diet group (D) (3 g/kg/d) from 6 to 12 mon of age. Protein-based food (meat purees, infant yogurt, cheese, whey protein) and a standard, cow-milk based formula were provided. Intake of formula, fruits and vegetables was ad libitum. Growth Z scores and 3d diet record were collected monthly.

Summary of Results This is an on-going trial and recruitment goal is 30/group. As of Sept, 2015, 33 infants completed the trial (17 M, 16 D). At baseline, there was no apparent difference of birth weight (M: 3.3±0.4 kg; D: 3.3±0.5 kg), gestational age (M: 39±1 w; D: 39±1 w) or maternal BMI (M: 28.7±7.1; D: 27.2±5.6) between groups. Calorie intakes at baseline (6 mon) were M: 87 ±17 and D: 97±16 kcal/kg/d. In M, protein intake was 1.9±0.4 g/kg/d and contributed to 9±1% of total energy. D had comparable protein intake of 2.1±0.4 g/kg/d and 9 ±1% of total energy. Formula provided >80% of protein and meat or dairy based solid foods provided <5% of protein. Protein intake increased during intervention to 3.2 ±0.9 g/kg/d and 3.4±1.1 g/kg/d at 10 and 12 months of age (~15% of energy at both time points), w/o group difference. Calorie intake was M: 96±25, D: 100±24 at 12 mon. Change of WAZ from 6 to 12 mon was 0.31±0.55 (M, P=0.05) and 0.47±0.46 (D, P=0.004). LAZ increased in M (0.35±0.47, P=0.01) and decreased in D (–0.35 ±0.60, P=0.01). Changes of WAZ and LAZ led to a significant increase of WLZ in D group (0.79±0.53, P=0.0002), but not in M group (0.24±0.65, P=0.19), and a significant difference between groups (P=0.028).

Conclusions Consuming 3g/kg/d of total protein with meat or dairy as the main source in solid foods is feasible in 6–12 months formula-fed infants and calorie intake from protein is still in normal range. Type of protein source did not appear to alter the participants' total calorie intake. The less favorable growth pattern in the dairy group (greater increase of WLZ) during the first year of life may increase risk of later obesity development.

384 IDIOPATHIC PULMONARY HEMOSIDEROSIS PRESENTING AS SEVERE ANEMIA: A CASE REPORT

M Cohen, C Nakamura. *UNSOM-Las Vegas, Las Vegas, NV*

10.1136/jim-d-15-00013.384

Case Report Idiopathic Pulmonary Hemosiderosis (IPH) is a rare disease leading to pulmonary hemorrhage. Patients most commonly present with hemoptysis, dyspnea and anemia as a consequence of recurrent alveolar hemorrhage. There are no extrapulmonary manifestations seen; however the hemorrhage generally results in iron deficiency anemia. Diagnosis is made when a patient presents as listed above in addition to a negative anti-glomerular basement membrane antibody, no serologic evidence of connective tissue disease and a biopsy showing no inflammation, infection or vasculitis. This report presents a 12 year old previously healthy African American female who presented to the ED for a 2 month history of fatigue and hemoptysis. Initial diagnostic tests showed a hemoglobin level of 3.1G/DL. Treatment was initiated with a normal saline bolus and 3 units of packed red blood cells. Additional evaluation included an extensive autoimmune and collagen vascular disease workup, including ANCA for granulomatosis with polyangiitis (also known as Wegener's granulomatosis) and serum milk precipitins for Heiner syndrome (IPH with milk allergy), which was negative. She was started on high-dose methylprednisolone at 1 milligram/kilogram per dose q.6 hours with one additional episode of hemoptysis while inpatient. She then had a laryngoscopy and bronchoscopy with bronchioalveolar lavage, which showed hemosiderin laden macrophages, aiding the confirmation of idiopathic pulmonary hemosiderosis. In this case report we discuss the recognition, diagnosis and treatment of idiopathic pulmonary hemosiderosis as it is a rare condition mainly seen in the pediatric population.

385 NUTRITIONAL INTAKE OF CHILDREN WITH NEPHROTIC SYNDROME

NM Polderman, M Cushing, D Matsell, M Catapang, A Sanchez, C Mammen. *BC Children's Hospital, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.385

Purpose of Study Information regarding nutrition management of childhood Nephrotic Syndrome(NS) is limited. Based on risks of corticosteroid side-effects (excessive weight gain, hypertension, and poor bone health), our recently developed clinical pathway incorporates standardized dietary recommendations for energy intake, daily sodium(Na), calcium(Ca) and Vitamin D(VitD) along with food intake records. This study compares dietary intakes of patients with NS to our pathway's nutrition recommendations.

Methods Used Our retrospective chart review included incident NS patients (1–17 years) seen from Feb 2013-Aug 2015 who completed a 3-day food intake record 4 weeks post-diagnosis which were analyzed using esha™ Food

Processor program. Patient demographics, height, and weight were collected from clinic charts. Our recommendations for daily energy requirements were based on weight, height, age, gender and sedentary activity factor to meet energy needs without promoting significant weight gain. Our recommendation for Na was 1 mg sodium/1 kcal. We recommended supplementation of 500 mg Ca and 1000 IU VitD to optimize bone health. We compared energy, Na and Ca intakes; and Ca and VitD supplements to our recommendations and daily recommended intakes (DRI).

Summary of Results Fifteen of 30 children (50%) completed food intake records. Seven of 15 patients (47%) exceeded our energy recommendations. Mean energy intake was 103+/–22% of daily recommendations. No patients exceeded >50% of our energy recommendations. Eight of 15 patients (53%) exceeded recommended Na intakes. Mean Na intake was 116+/–58% of recommendations, 2 patients exceeded >50% of our Na recommendations. Mean Ca intake was 70+/–25% of DRI. Only 13% met DRI for Ca. Of 6 patients who reported Ca and VitD supplementation, 83% had total Ca intakes that met DRI and 67% met DRI for VitD.

Conclusions Food intake records of children with NS indicate approximately half of patients exceeded our pathways' recommendations for daily energy and Na recommendations indicating that further nutritional education may be required in specific patients. Based on intake data, we feel that our energy and Na recommendations are reasonable and attainable for most patients. Overall low intakes of Ca and VitD justify our pathway's recommendation of daily supplementation in order to optimize bone health.

Community Health III
Concurrent Session
8:00 AM
Saturday, January 30, 2016

386 MEDIA LITERACY EDUCATION TO PREVENT ELECTRONIC NICOTINE DELIVERY SYSTEM USE BY ADOLESCENTS

A Watson. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-d-15-00013.386

Purpose of Study Media Literacy Education (MLE) aims to decrease and prevent adolescent electronic nicotine delivery system (ENDS) use by increasing adolescent skills in deconstructing ENDS advertisements and media promotions.

Methods Used Through key informant interviews, ENDS use by adolescents and lack of knowledge of ENDS safety were identified as growing issues is Bear Lake County. Research on adolescent tobacco prevention showed MLE was effective in helping students understand advertising's persuasive intent and decreased desires to use tobacco products.

Summary of Results The project aims to decrease adolescent ENDS use by improving media literacy in 9th grade students. The public health office was provided a free MLE curriculum (http://www.aditup.net/) that can be adapted to ENDS advertising. Additionally, current research on ENDS safety, including a concise summary of safety data from the American Journal of Medicine and the current stance on ENDS from the American College of Physician was provided and presented. Finally, additional research findings regarding other tobacco cessation and prevention strategies were given.

Conclusions Initial short-term safety data indicates that ENDS products have health risks, yet many people in the community hold the unsubstantiated belief that ENDS are a safe alternative to traditional tobacco use. While public health officials understand ENDS safety risks, it is difficult to relay the message when long-term health effects are currently unavailable. The next step for the public health office is to communicate the known risks of ENDS to both adolescents and the general community. In addition, partnering with teachers to implement media literacy education in 9th grade classes can help adolescents view ENDS advertisements and media with a critical eye to prevent and decrease their use.

387 OBESITY AND DIABETES PREVENTION EDUCATION IN LINCOLN PUBLIC SCHOOLS

H Kibort-Crocker. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-d-15-00013.387

Purpose of Study This intervention aims to educate 7th–10th grade students on healthy lifestyle choices as a means of preventing childhood obesity and the development of diabetes.

Methods Used A meeting with the Montana Diabetes Program at the Lewis and Clark County Department of Public Health and Human Services revealed that Lincoln is below average on a number of diabetes measures, and recent cuts to the diabetes educator's hours make a trip to Lincoln unlikely. After meeting with the principal and the Health and Physical Education teacher at Lincoln Public Schools, it was proposed to create an obesity and diabetes curriculum. A literature review was completed to determine the most effective messages and methods of obesity prevention. While the review showed no clear consensus on the best delivery method, four central messages were recommended. Topics and activities were chosen based on an evidence-based intervention implemented in the Midwest.

Summary of Results A two-week curriculum for the 7th/8th and 9th/10th grade classes was created based on the core message of 5 servings of fruits and vegetables, fewer than 2 hours of recreational screen time, 1 hour or more of physical activity, and 0 sugar drinks each day. An evidence-based online diabetes education program was also included. This curriculum was presented to the Health and PE teacher to be implemented in the upcoming school year.

Conclusions By implementing this intervention through Lincoln Public Schools, all children in 7th–10th grade who live in Lincoln will receive obesity and diabetes education this year. An important next step would be to involve the whole community to increase the healthy options throughout the town, to make the healthy choice the easy choice.

388 SAFE OTC: A COMMUNITY EDUCATION CAMPAIGN IN POWELL, WY

CV Jackson. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-d-15-00013.388

Purpose of Study Safe OTC was designed to utilize point-of-decision advertising techniques to increase community understanding about safe and effective over-the-counter (OTC) medication use.

This campaign was designed for implementation by Park County Public Health Rx workgroup (RxWG) who had previously identified a need for public education regarding OTC meds but had not yet developed a campaign stategy. Nationwide, seniors have been shown to use 50% of all OTC meds purchased in the U.S. On average, rural elderly use more OTC meds than urban elderly. As seniors make up 16.6% of Powell's population (compared to 12.4% in WY), Safe OTC will service this at risk population.

Methods Used Through interactions with patients in the clinic and conversations with RxWG, it was clear that many Powell citizens are at risk of serious health consequences from taking OTC meds incorrectly and are unsure which OTC meds are best for their individual symptoms and health history. The RxWG was eager to implement a campaign if they had assistance researching and developing it. A literature search revealed that point-of-decision advertising would be the most effective and practical way for the campaign to make an impact.

Summary of Results Safe OTC includes a series of eight ads for the popular Powell Tribune paper as well as flyers to be placed in the OTC med aisle at the local grocery store and pharmacy. Each ad addresses one commonly used OTC med and includes the purpose of the medication, generic and brand names, and factors that increase user risk of side effects. Each ad contains the statement "cut me out and tape me to your medicine cabinet". The flyers contain general safety information regarding OTC med use and charts to help simplify decision making when purchasing meds. These materials, an implementation plan, and a report containing findings from a literature review were presented to RxWG.

Conclusions While developing Safe OTC, it was surprising to discover how little public education material already exists about specific OTC meds, further highlighting the need for accessible and understandable information regarding this topic. RxWG consists of invested community members with previous experience implementing campaigns, connections with the local pharmacy and newspaper, and grant funding to cover costs associated with program execution. Partnership with the RxWG is the strength of this campaign.

389 EVALUATION OF A COMMUNITY-BASED HEALTH EDUCATION INTERVENTION TO IMPROVE EARLY CHILDHOOD NUTRITION IN RURAL KENYA

L Matheson,[1] S Walton,[1] N Kotadia,[1] D Webster,[1] V Kapoor[2]. *[1]University of British Columbia, Vancouver, BC, Canada; [2]University of British Columbia, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.389

Purpose of Study According to the Kenya Bureau of Statistics (2013), Kisumu regional data displays high rates of malnutrition and stunting among young children, often leading to physical and cognitive developmental delays. In 2014, nutrition workshops were delivered to Community Health Workers (CHWs) in order to provide them with the tools to educate community members on maternal and early childhood nutrition. The aim of this study was to evaluate if the train-the-trainer method improved community nutrition knowledge and practices.

Methods Used Focus group discussions were conducted with CHWs in three villages. Facilitators asked questions based on the nutrition seminars delivered in 2014. Basic food groups, knowledge and practices surrounding childbirth, breastfeeding and complementary feeding were discussed. Five household surveys were conducted per village, and the inclusion criteria was women of childbearing age. Survey questions addressed the same topics covered with CHWs to assess how well this knowledge was conveyed to the community.

Summary of Results The findings suggest that the information provided in the 2014 nutrition workshops was successfully retained among CHWs and conveyed to mothers in the community. For example, household surveys confirmed that 100% of women were aware of the exclusive breastfeeding protocol for 6 months prior to initiating complementary feeding, and that women should breastfeed for minimum 2 years. However, while many women were aware of these guidelines, they were often unable to adhere to them due to barriers such as inadequate finances or lack of access to nutritious foods.

Conclusions Overall, the train-the-trainer teaching method was found to be an effective knowledge translation tool for maternal and early childhood nutrition education in rural communities. This format is appealing because it provides a community with the means to sustainably educate its members on important health topics. Future education teams can apply this teaching method to a variety of health topics in order to bolster overall community health.

Kenya National Bureau of Statistics (2013). Kisumu County Multiple Indicator Cluster Survey 2011, Final Report. Nairobi, Kenya: Kenya National Bureau of Statistics.

390 EVALUATION OF HAND HYGIENE KNOWLEDGE, PRACTICES, AND BARRIERS IN RURAL UGANDA

PJ Hemmons, T Okuda, V Fung, A Geddes, V Kapoor. *University of British Columbia, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.390

Purpose of Study The goal of the study was to evaluate current hand hygiene knowledge and practices of community health workers (CHWs), and community members (CMs). In addition, this project explored barriers to hand hygiene faced by the communities in and surrounding Nakaseke district of Uganda.

Methods Used Two distinct populations were analyzed: CHWs and CMs. All populations were invited to participate in a survey that assessed participants' current hand hygiene knowledge and practices. All surveys were

facilitated by a local translator and UBC medical students. A subset of the CHWs participated in a focus group to discuss barriers to hand hygiene in their communities.

Summary of Results Surveys were obtained from 62 community health workers, and 24 community members. 46.8% of CHWs and 58.3% of CMs reported that the top reason for washing their hands was to "avoid germs". 100% of CHWs and 95.8% of CMs washed their hands after visiting the toilet, while 85.8% of CHWs and 75% of CMs washed their hands before preparing food. 97.4% of CHWs washed their hands with both soap and water, however only 79.2% of CMs washed with soap ($p=0.00561$). This lower percentage of soap utilization among CMs relates to a reported lack of financial resources that often prevent families from purchasing soap. As well, 43.9% of CHWs and only 29.9% CMs washed their hands for greater than 30 seconds ($p=0.2379$), while 19.4% of CHWs vs 41.7% of CMs washed their hands for 5–15 seconds ($p=0.034$). This discrepancy in proper hand hygiene practices could be caused by the CHWs' reported barriers to sharing their knowledge of hand hygiene practices in their communities, including: cultural and traditional beliefs, incorrect information, lack of resources (e.g., financial, transportation), and CMs seeing CHWs as equals rather than teachers.

Conclusions Although CHWs, and community members in Nakaseke had a relatively strong understanding of the importance of proper hand hygiene, there were a variety of barriers the community faced which prevented best practices. Even though CHWs were generally found to have a greater understanding of hand hygiene practices than CMs, there were a number of obstacles they encountered in sharing this knowledge in their communities. Future directions would include exploring potential solutions to some of the barriers faced by CMs.

391 HELPING THE PRE-DIABETIC AND OVERWEIGHT OF MILES CITY ACCESS THE RESOURCES TO PREVENT DIABETES

B Murphy. *University of Washington, Seattle, WA*

10.1136/jim-d-15-00013.391

Purpose of Study This project's goal is to help people who are overweight and pre-diabetic find and access the resources that will benefit them: trail systems around Miles City and education through a pre-diabetic education group.

Miles City is the County Seat of Custer County with a population of 8,600 people. 27% of the city's population is obese and 8.8% have diabetes; both are above state averages. The number of pre-diabetics in Miles City is unknown. Physical inactivity is 27%, whereas state numbers are 22%. After spending time in Miles City, physical inactivity is clear. However, Miles City has great resources for people that are pre-diabetic and overweight.

Methods Used "Nature's Prescription Pads" were suggested by someone actively working on increasing the health of Miles City. They give physicians the ability to prescribe physical activity in a manner they see fit. Literature shows that Spain and two provinces in Canada that are providing such prescription pads for their physicians have seen results.

Also, a handout was made that physicians can give their patients which maps out six different trails to walk in Miles City, the distance of each trail and the calories burned on each trail for a 160 lb. person.

Summary of Results After talking to four physicians and mid-level primary care providers about the pads and the literature supporting its efficacy, enthusiasm was shown for the project.

The success of Healthy Lifestyles (HL) was discussed with physicians. The group gives a one year course with topics in healthier eating, exercising and dealing with mental distractions to pre-diabetics.

The handout has been asked to be used by Cardiac Rehab at Holy Rosary Hospital, the Chamber of Commerce to distribute to Miles City hotels, arthritis classes and Healthy Women classes in town, the Holy Rosary website and help desk and by the bikewalkmontana.org website.

Conclusions Major challenges include provider usage and the patients' response. Literature shows 1 in 26 patients will significantly modify their physical activity from a doctor's prescription. Hopefully HL can increase the ratio, and literature produced from HL's work demonstrates it likely will. The cost of the class costs $150, but scholarships are available.

Future work could be to study the effectiveness of our work and to increase pads to more providers in the area.

392 EXPANDING ACCESS OF INTRANASAL NALOXONE TO COLUMBIA COUNTY EMERGENCY MEDICAL TECHNICIANS

T Hughes. *University of Washington, Spokane, WA*

10.1136/jim-d-15-00013.392

Purpose of Study This project looks to decrease the amount of opioid overdose deaths in Columbia County by creating protocol allowing for the administration of intranasal (IN) naloxone.

Methods Used Research in the safety and effectiveness of IN naloxone by first responders supports widening the distribution of this medication. Rural EMS being given access to IN naloxone drastically increases the services they can provide an opioid-overdose victim. IN naloxone also has the added benefits of not putting first responders at risk of needle sticks, while decreasing the amount of time an overdose victim has to wait before receiving life-saving medication. The research and idea were presented to the Medical Program Director (MPD) of Columbia County, along with the EMTs that would carry out the proposed protocol.

Summary of Results This project looks to write new protocol detailing when and how to administer IN naloxone to suspected opioid overdose victims. Protocol was written using state and other city protocols as templates followed by an editing process with the MPD to ensure correctness and clarity.

Conclusions Getting approval from regional and state DOH councils are the biggest limiting factor. The next step is to bring the project to the local EMS for ratification and

then to regional and state authorities for review. Recent state RCWs encourage "fire department personnel to work with the county medical program director to obtain supplies of naloxone," and providing naloxone to first responders "to be in the public interest." This project aimed to align county protocol with state recommendations to curb deaths from opioid overdose.

393 TATTOO REGULATIONS: PERMANENT REGULATIONS TO GET INKED IN BUFFALO, WYOMING

M Johnson. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-d-15-00013.393

Purpose of Study This project aims to establish tattoo regulations in Buffalo Wyoming to protect public health and establish safety standards to reduce the risk of blood borne pathogen transmission.

As an invasive procedure there is no doubt tattooing poses a risk to public health from both local and systemic infections. Both of which have been documented due to tattooing, producing major concerns of HCV, HIV, Bacterial, Viral and inflammatory reactions. However, the risk of such infections is negligible when tattooing is conducted under appropriate hygienic and sterile conditions. Johnson County is one of many Wyoming Counties with no health or sanitation regulations for tattooing. The city of Buffalo is the seat of Johnson County with a population of 4,638 of the 8,573 inhabitants of the county. The establishment of two tattoo parlors within four months in this rural community has increased awareness and established a pressing need to implement standardized health practices ensuring licensed tattoo parlors are providing safe and regulated services.

Methods Used Evidence based literature indicates appropriate regulations play a vital role in the management and reduction of the associated health risks from tattooing. Appropriate regulations are both necessary and beneficial, providing protection to the business and client.

Summary of Results The aim is to establish guidelines to normalize health regulations within Johnson County so a standard of care is provided to all consumers, as well as the identification of all tattoo establishments for better public health control and awareness. This was conducted through a variety of community education presentations; a radio announcement, speech at the city council meeting, and the distribution of literature review report to community partners; the Mayor and City Council members.

Conclusions Having gained support from the Mayor of Buffalo and its City Council members, the next step is obtaining support from the County Commissioners for the dissemination of tattoo regulations to the county. There is tremendous support from the Buffalo community and tattoo business owners for the establishment of tattoo regulations. Implementing county wide regulations on tattooing is effective way to regulate public health standards with regards to Tattooing practices Buffalo and to begin the motion for State wide implementation of tattoo regulations.

Endocrinology and Metabolism III
Concurrent Session
8:00 AM
Saturday, January 30, 2016

394 TWO NEW GENES INVOLVED IN LIPID METABOLISM?

JM Yaghoubian,[2] N Ehrhardt,[1] JW Burke,[2] U Tan,[2] M Peterfy,[1] S Fuchs[2]. [1]*Cedars-Sinai Medical Center, Los Angeles, CA;* [2]*Western University of Health Sciences, Pomona, CA*

10.1136/jim-d-15-00013.394

Purpose of Study The purpose of this project is to study the phenotype of SPTY2D1 and TM6SF2 inactivated mice. Genetic studies in patients have identified isoforms of these genes associated with abnormal lipid and other metabolic profiles. Based on observations in humans, we are studying the effects of the down-regulation of these genes, on weight, lipid panel, and glucose levels, under normal or restricted diets.

Methods Used Mouse models for each gene (SPTY2D1 and TM6SF2) were produced and used in the cohort studies. Retro-orbital blood was collected at 8 to 20 weeks, to measure LDL, HDL, triglycerides and glucose levels. These measurements were performed after 4 or 16 hours of fasting. Mouse lengths and weights were also measured weekly for comparison and body mass index (BMI) equivalent calculations (weight in grams divided by the square of snout to anus length in millimeters).

Summary of Results Spty2d1 inactivated mice did not show any impairment in lipid metabolism compared to wild-type (WT) animals. However, these knockout (KO) mice have a decreased plasma glucose concentration compared to WT. TM6SF2 KO females showed decreased plasma cholesterol levels compared to WT females, which recapitulates the human loss-of-function phenotype but no modification in total plasma triglyceride concentration. KO SPTY2D1 male mice show a significant weight reduction ($p<0.020$) as compared to the combined WT and heterozygous (Hz) populations at 9 weeks of age. There was no difference in WT versus Hz mouse weights in either males or females, however in females there is a decrease in KO weights when compared to WT ($p<0.014$) and Hz ($p<0.003$). The trend is similar in male mice.

Conclusions The inactivation of the SPTY2D1 is responsible for a decrease in plasma glucose levels and is associated with a 15% reduction in body weight in both males and females. The inactivation of TM6SF2 decreased plasma cholesterol without modification of the triglyceride levels.

395 LOW INHIBIN B CORRELATES WITH FEATURES OF METABOLIC SYNDROME IN PREPUBERTAL BOYS WITH KLINEFELTER SYNDROME

S Davis,[1] N Lalou,[2] M Bardsley,[3] M Temple,[2] K Kowal,[3] J Ross[3]. [1]*University of Colorado, Aurora, CO;* [2]*Hopital Cochin, Paris, France;* [3]*Thomas Jefferson University, Philedelphia, PA*

10.1136/jim-d-15-00013.395

Purpose of Study Klinefelter syndrome (KS) is the most common sex chromosome aneuploidy, occurring in ~1/600

male births. The phenotypic spectrum includes nearly universal testicular insufficiency in adulthood, high prevalence of metabolic syndrome (MetS), and increased mortality from cardiovascular diseases. Testicular insufficiency may contribute to MetS and increased cardiometabolic risk. The goal of this study was to evaluate whether gonadal function was related to the MetS phenotype in prepubertal boys with KS.

Methods Used In this double-blind, placebo-controlled clinical trial (NCT00348945), 93 boys with KS, 4–12 years, were randomized to oxandrolone or placebo for a 2 year period. In this report we analyzed features of MetS and testicular function at baseline in boys who were <9.5 years of age and tanner 1 pubertal development (n=59). MetS was defined as meeting at least 3 of the following criteria: waist circumference >75%ile for age, triglycerides >97 mg/dl, HDL <50 mg/dl, blood glucose >110 mg/dl, and systolic or diastolic blood pressure >90%ile for age and height.

Summary of Results At least 1 feature of MetS was present in 81% of subjects, while full MetS criteria were met in 17% of subjects. Total testosterone (TT) by liquid chromatography mass spectroscopy was less than the lower limit of the reference range in 47% of subjects. 18% of subjects had an inhibin B (INHB) <5%ile for age. In a logistic regression model, low INHB, but not low TT, was significantly associated with the probability of meeting at least 3 MetS criteria (p=0.047). An INHB <50 ng/dl yields a sensitivity of 83.3% and specificity of 79.2% for meeting full criteria for MetS.

Conclusions Cardiometabolic risk markers and gonadal insufficiency are common in prepubertal boys with KS. This study is the first to suggest an association between impaired sertoli cell function (low INHB) and a higher risk cardiometabolic phenotype. Whether testicular dysfunction is the cause of MetS or both testicular and cardiometabolic function are mediated by an underlying mechanism cannot be determined from this cross-sectional data. Future analysis will examine two year longitudinal data to further investigate this relationship.

396 EXPLORING THIOREDOXIN INTERACTING PROTEIN REGULATED METABOLISM IN ANAPLASTIC THYROID CANCER

LJ Hostetter,[1] J Morrison,[2] V Sharma,[2] J Severson,[2] B Haugen[2]. *[1]University of Colorado Denver School of Medicine, Denver, CO; [2]University of Colorado Denver Anschutz Medical Campus, Denver, CO*

10.1136/jim-d-15-00013.396

Purpose of Study In the assessment of prognosis of a thyroid cancer patient tumor PET positivity (indicating increased glucose uptake) is associated with poorly differentiated tumor types as well as poor prognosis. Interestingly, thioredoxin interacting protein (TXNIP) expression has been shown to be downregulated during the transition from well-differentiated thyroid cancer to poorly-differentiated anaplastic sub-types(ATC), and is a tumor suppressor in thyroid cells. TXNIP has been previously shown to inhibit glucose uptake via endocytosis of the GLUT-1 transporter from the cell surface, as well as inhibition of GLUT-1 transcription. Though TXNIP has many functions, we hypothesize TXNIP's negative regulation of glucose metabolism is critical to its tumor suppressor activity.

Methods Used Multiple ATC cell lines were used to model the effects of stable overexpression of TXNIP, including T238, Ocut2c, 8505c, and HTh74.TXNIP has been shown to negatively regulate GLUT-1 expression at the transcript level and cell surface. To investigate the effects of TXNIP on GLUT-1 expression in thyroid cancer cells, we assessed cell surface expression of GLUT-1 by flow cytometry. GLUT-1 transcript expression was quantified with qPCR, and total GLUT-1 protein was analyzed with western blot.

Summary of Results Cell surface GLUT-1 expression was variable between trials when comparing the vector control cell line to the TXNIP overexpressing cells. However, the changes were minimal, and in some cell lines no difference was observed between the vector and TXNIP lines. Western blot analysis showed minimal changes in total GLUT-1 protein in cells with overexpressed TXNIP compared to controls. GLUT-1 mRNA levels showed mixed results.

Conclusions In an *in vitro* model of TXNIP overexpression in ATC cells, no significant changes in cell surface expression of GLUT-1, total GLUT-1 protein, or GLUT-1 mRNA were observed under standard conditions. However, there are inherent limitations to these studies (endogenous TXNIP expression, media glucose etc). Future directions include using the CRISPR Cas9 system to knock down TXNIP expression in thyroid cancer cells lines to further investigate the role of TXNIP as a modulator of glucose metabolism in ATC.

397 MACROPHAGES SECRETE ESTROGENS WITH EVIDENCE FOR POTENTIAL DE NOVO STEROIDOGENESIS

S Wang, A Chait, K Rubinow. *University of Washington, Seattle, WA*

10.1136/jim-d-15-00013.397

Purpose of Study Estrogens are critical regulators of lipid and glucose metabolism in adipose tissue, but the determinants of tissue-specific estrogen levels are unknown. Adipose tissue estrogen concentrations do not associate with circulating estrogen levels, suggesting the importance of local estrogen production. Macrophages reside in adipose tissue and express aromatase, the enzyme required for conversion of androgens to estrogens, but whether macrophages secrete estrogens or aromatize androgens solely for intracrine signaling has not been determined. We quantified estrogen secretion from murine macrophages and, further, investigated mechanisms of steroidogenesis in these cells.

Methods Used Estrogen secretion from murine bone marrow-derived macrophages (BMDMs) was quantified by LC-MS/MS. Steroidogenic enzyme expression was assessed through rt-PCR and immunoblotting. Two-dimensional TLC with phospho-imaging was employed to assess incorporation of ^{14}C-labeled acetate into secreted sex steroids. BMDMs were cultured in the presence of atorvastatin to

determine whether cholesterol synthesis regulates expression of steroidogenic genes.

Summary of Results Murine macrophages secrete estrogens and amplified media concentrations of 17β-estradiol >20-fold (252±41 pg/mL in conditioned media vs. <10 pg/mL in cell-free media). 17α- and 17β-estradiol were the most abundant estrogens secreted by BMDMs. All enzymes required for *de novo* steroidogenesis were expressed at the mRNA level in BMDMs, and protein expression was detected for CYP11A1, the enzyme that catalyzes the initial step in steroid synthesis from cholesterol. TLC demonstrated co-localization of labeled acetate with secreted estrogens, suggesting synthesis directly from cholesterol. Atorvastatin treatment significantly decreased *Cyp11a1* mRNA expression in BMDMs.

Conclusions Macrophages secrete estrogens and may contribute to tissue-specific estrogen levels. Macrophages may be able to synthesize estrogens directly from cholesterol and thereby generate sex steroids independently of circulating steroid intermediates. Macrophage steroidogenesis appears regulated in part by intracellular cholesterol production. Estrogen secretion may prove a wholly novel facet of macrophage paracrine function. The possible metabolic roles of macrophage-derived estrogens require further investigation.

398 ROLE OF LIPOPROTEIN LIPASE IN NEURONS OF THE BRAIN

I Rudenko, K Bruce, H Wang, R Eckel. *University of Colorado School of Medicine, Denver, CO*

10.1136/jim-d-15-00013.398

Purpose of Study Lipid metabolism in the brain has been implicated in a number of pathological processes including neurodegenerative disease and impaired energy homeostasis. Lipoprotein lipase (LPL) plays a key role in peripheral lipid metabolism by hydrolyzing lipoprotein-derived triglycerides and facilitating free fatty acid uptake, but its role in the brain is less clear. Previously our lab has shown that mice lacking neuronal LPL develop poor cognitive function and obesity, however the molecular mechanisms underlying these phenotypes are unknown. In this study we aim to characterize LPL's role in neuronal function by developing high resolution imaging techniques that accurately measure neuronal lipid accumulation.

Methods Used To determine the function of LPL in the neurons we utilized mHypoE41 (N41) immortalized mouse hypothalamic neurons with variable expression of LPL. N41 cells overexpressing LPL were created by infection of cells with murine stem-cell retrovirus carrying a control or mouse LPL cDNA construct. N41 LPL knockdown cells were created by infection of cells with lentivirus carrying a control or a construct coding for shRNA against the LPL gene. Third Harmonic Generation and Adipored™ staining were used for imaging of lipid droplets in the cells. Image J software was used to quantify the lipid droplets.

Summary of Results N41 LPL overexpressing cells showed a 2-fold increase in number of lipid droplets. N41 LPL knockdown cells showed a 2-fold reduction in number of lipid droplets. Interestingly, while the number of droplets was increased the lipid droplet volume was not significantly different in either cell line.

Conclusions We used a combination of Third Harmonic Generation and Adipored™ to validate the presence of lipid droplets in individual cells and in the future we will utilize the technique that provides the most robust results in the *in vivo* setting. We demonstrated that LPL is involved in lipid droplet accumulation in cultured immortalized mouse hypothalamic neurons. However, an *in vitro* system is not an accurate representation of neuronal microenvironment, which is influenced by the presence of glia cells. Our next step is to utilize viral stereotaxic injections to analyze the function of LPL in neurons of specific brain nuclei to gain critical insights into the pathophysiology/neuronal origins of cognitive and metabolic disorders.

399 CONTROL OF LIPID DROPLET SIGNALING IN MURINE SPERMATOZOA

B Tully,[1,2] J Duke,[2] K Roberts,[2] T Chauvin[2]. [1]*University of Washington School of Medicine, Seattle, WA;* [2]*Washington State University, Spokane, WA*

10.1136/jim-d-15-00013.399

Purpose of Study Upon entry into the female reproductive tract, sperm enter a state of hyperactivity termed capacitation, which proceeds through a cAMP-PKA pathway and phosphorylation of downstream proteins. Proteomic analysis of mouse epididymal sperm reveals proteins involved in lipid catabolic pathways, such as hormone sensitive lipase (Lipe) and perilipin (Plin3), suggesting sperm may utilize triacylglyceride (TAG) for energy, a novel concept in reproductive biology. Both hormone sensitive lipase (HSL) and perilipin are known to be phosphorylated when enzymatically active. This study looked at the phosphorylation status of Lipe during capacitation and the amount of free fatty acids and glycerol produced during non-capacitation and capacitation conditions ex vivo.

Methods Used Sperm cells were isolated from the cauda epididymis of mice and subjected to various conditions including non-capacitating media, capacitating media, and media containing H–89, an inhibitor of protein kinase A (PKA). After the appropriate time step, supernatant was used to measure free fatty acid and glycerol liberated by the sperm. Pelleted cells were lysed and protein was used to perform Western blots with phospho-HSL and HSL antibodies.

Summary of Results Free fatty acid assays show that compared to non-capacitated sperm, capacitated sperm release more fatty acids per period of time (0.6±0.1 vs 1.8±0.2 uM/10^6 sperm). Exposure to H–89 showed no decrease in free fatty acids when compared to capacitating conditions (1.9±0.2 vs 1.6±0.1 uM/10^6 sperm). Glycerol did not differ significantly among various conditions. Western blots revealed that HSL is phosphorylated during capacitation and that the phosphorylation status of HSL is decreased with exposure to the PKA inhibitor H–89.

Conclusions Released free fatty acids may help provide the energy necessary for hyperactive motility of sperm during capacitation. Another possibility is that the liberated free fatty acids could be used in a different manner such as

intracellular or intercellular signaling. Phosphorylation of HSL in sperm cells is a PKA-dependent event.

400 ADRENAL INSUFFICIENCY IN EOSINOPHILIC ESOPHAGITIS PATIENTS TREATED WITH SWALLOWED TOPICAL STEROIDS

H Rahat, C Wood, G Furuta, D Atkins, S Hsu. *Children's Hospital Colorado, Aurora, CO*

10.1136/jim-d-15-00013.400

Purpose of Study The aims of our study were to determine how often Adrenal Insufficiency (AI) occurs with chronic Swallowed Topical Steroids (STS) use and to document co-morbid features.

Methods Used We instituted a quality improvement program in our multi-disciplinary Gastrointestinal Eosinophilic Diseases Program to increase awareness of potential chronic STS side effects. Initially, we completed a retrospective analysis of all STS-treated Eosinophilic Esophagitis (EoE) patients seen in the program from 2007 to 2013 and documented how many had an abnormal a.m. cortisol level. This group was labeled as our retrospective group (RG). Cortisol levels measured in a fasting state and drawn between 7 am and 9 am were accepted as valid. As a part of standard of care, we then prospectively measured morning cortisol levels of EoE children treated with STS for over four months. This group was labeled as our prospective group (PG). If two cortisol levels were <5 mcg/dl, then an ACTH stimulation test was performed in order to test for Al. A peak cortisol level of <18 mcg/dl was diagnostic for AI.

Summary of Results Our RG consisted of 166 children. Of these patients, 8 had a morning cortisol drawn, 2 of which were abnormal. One child had an abnormal ACTH stimulation test and was diagnosed with AI. Our PG consisted of 225 children, out of which 106 had a morning cortisol drawn. Of the 106 children, 33 had a normal cortisol (>10 mcg/dI), 45 had an intermediate cortisol (5-10 mcg/dI) and 28 had an abnormal cortisol (<5 mcg/dI). Of this last group, 3 had AI based on their ACTH stimulation test results. None of these 3 patients had clinical features of AI prior to, or after, the AI diagnosis (i.e. fatigue, hypoglycemia, hypotension or cushingoid appearance). BMI percentiles ranged from 43% to 54%, height percentiles ranged from 1% to 49%. All 3 AI patients had been treated with STS as well as with other steroid treatments for asthma and allergic rhinitis. When comparing the RG to the PG, we found that patients were similar in age, sex, and the number of steroid modalities used. More than 70% of patients in both RG & PG groups were males; More than 50% used Fluticasone as STS treatment.

Conclusions A small fraction of children with EoE treated with STS had biochemical evidence of AI.

401 MODY3 AND DIABETES TYPE 2 COMBINE TO YIELD STUBBORN BLOOD SUGAR MANAGEMENT

J Vercollone. *University of Washington, Seattle, WA*

10.1136/jim-d-15-00013.401

Introduction Maturity onset diabetes of the young (MODY) should be suspected in patients with diabetes not matching typical type 1 or type 2 phenotype, a strong family history of diabetes and age of onset before 25 years. MODY3, the most common form, is characterized by insulin sensitivity that can usually be managed with sulfonylurea monotherapy.

Clinical Case 43M diagnosed with type 2 diabetes at age 27 and placed on metformin. Later in his management, he was found to have a strong family history of diabetes and tested for MODY (MODY3 and MODY2). He had a Hepatocyte nuclear factor-1 alpha (HNF-1a) mutation (MODY3) and subsequently his family members were tested. The HNF-1a mutation was found in his father and 2 daughters who did not have clinical diabetes. However, his mother, sister, maternal uncle and maternal grandmother had diabetes (all on insulin) but not the HNF-1a mutation. The patient's Hemoglobin (Hb) A1c was 7.4% at initial diagnosis as well as at the time of genetic testing 9 years later. He was then switched over to a sulfonylurea (glyburide) and his blood sugar went up precipitously to >300mg/dL. He was transitioned back to metformin but sitagliptin and pioglitizone were added given the persistently high blood glucose (BG) levels. With no improvement in glycemic control, he was escalated to insulin therapy using NPH and Lispro to little avail. Subsequently in our care, we switched him to dose equivalent glargine and, over time, continued to escalate the dose and add liraglutide with no change in his HbA1c. He has had normal fructosamine, iron studies, microalbumin and lipid levels and each time we added a new medication or increased his insulin, his fasting blood glucose decreased for a few days and then trended right back up to an average of 170-180 mg/dL. He feels hypoglycemic with BG<100 mg/dL and has lost 10-15 lbs also with no change in his HbA1c or fingerstick BG.

Discussion Despite having MODY3, our patient is not responsive to sulfonylurea therapy and requires insulin therapy. He also does not follow the trend of insulin resistance typical for type 2 diabetes or diminished insulin production seen in MODY3. His HbA1c remains around 7.4%, despite varied therapies and with his strong family history of both MODY3 and type 2 diabetes, a mixed phenotype is likely contributing to his presentation.

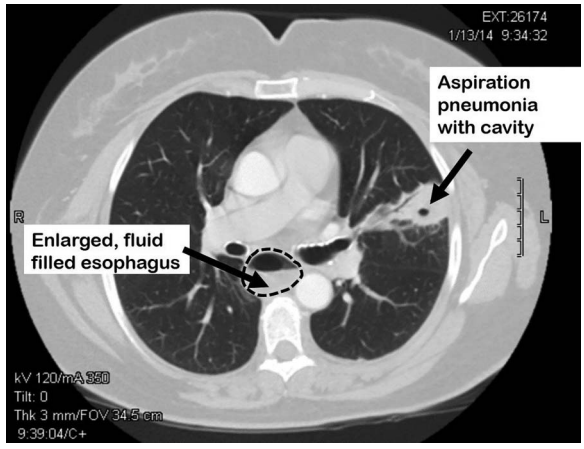
General Internal Medicine and Aging
Concurrent Session
8:00 AM
Saturday, January 30, 2016

402 A RARE COMPLICATION OF A COMMON OBESITY PROCEDURE

L Ereifej, R Crowell, D Schade. *University of New Mexico, Albuquerque, NM*

10.1136/jim-d-15-00013.402

Case Report Obesity is a common disease that effects more than one-third of U.S. adults. Laparoscopic gastric banding has been widely used to treat obesity. Aspiration pneumonia has not been reported as a complication of bariatric surgery. We present a patient who had bariatric surgery and presented with aspiration pneumonia



Abstract 402 Figure 1

secondary to gastric banding induced esophageal food retention.

A 64 y/o female with a past medical history of Type 1 diabetes, obesity and laparoscopic gastric banding presented to urgent care with one month of dry, continuous cough. In addition, she complained of chronic vomiting since her gastric band surgery. She denied fevers, sweating, chills or chest pain. At the urgent care, vital signs were normal. A chest CT scan demonstrated a large opacity in the left upper lobe peripherally containing an air bronchogram. Lymphadenopathy was present in the pretracheal area. Of particular note was that the esophagus was significantly enlarged and fluid filled as demonstrated in the imaging below. Miscellaneous blood culture tests were negative. The patient was diagnosed with aspiration pneumonia. She received appropriate antibiotics for 3 weeks and the gastric band was deflated. After a month, a repeat CT scan showed resolution of the pneumonia. The patient's cough completely resolved and her esophagus returned to normal size.

Laparoscopic gastric banding is one of the most common weight-loss surgery performed in the United States. Aspiration pneumonia is an unreported complication of gastric banding. Not recognizing this complication may a cause delay in the correct diagnosis and lead to invasive procedures with increased morbidity.

403 DOES ASTHMA INCREASE CARDIOVASCULAR RISK IN TYPE 2 DIABETES?

MD Ehrhart, C Murray-Krezan, F Qeadan, MR Burge. *UNM HSC, Albuquerque, NM*

10.1136/jim-d-15-00013.403

Purpose of Study Type 2 diabetes (T2D) and asthma are independent risk factors for cardiovascular disease (CVD), but the CVD risk for patients with both conditions has not been evaluated. The ACC/AHA Cardiovascular Risk score is designed to estimate the 10 year risk of a major CVD event using validated clinical indicators. The instrument incorporates well-recognized risk factors, including age, sex, race, total and HDL cholesterol, blood pressure, smoking status, and diabetes. We hypothesized that people with both T2D plus Asthma would have a significantly higher 10 year risk for a major CVD event than people with T2D alone.

Methods Used Data from the Electronic Medical Record at UNM HSC were obtained using a standard query. ICD-9 billing codes were used to define diagnoses. People in the T2D Alone cohort had a dignosis of T2D, and those with a diagnosis of asthma or who had received a prescription for a beta-2 agonist medication were excluded. The T2D plus Asthma cohort had diagnoses of both T2D and asthma, and those with other respiratory conditions, such as COPD, were excluded. The 10 year major CVD event risk for each cohort was the primary outcome variable. After a large initial data pull, 551 individuals who met inclusion criteria were sampled. Because this initial sample disproportionately represented females, the data set was further truncated to reflect the gender demographics of New Mexico.

Summary of Results We identified 124 patients with T2D Alone and 143 patients with T2D plus Asthma who had complete data sets. Individuals with T2D Alone had a higher 10 year risk for a major CVD event than did individuals with T2D plus Asthma: Median (Interquartile Range) =7.1% (3.1, 13.0) vs. 4.7% (2.1, 11.2) ($p<0.05$). Descriptive characteristics of the cohorts are shown in the data table.

Conclusions Individuals with comorbid T2D plus Asthma had a lower cardiovascular disease risk than those with T2D alone. This finding may be the result of an

Abstract 403 Table 1

Variable	T2D Alone (n=124)	T2D+Asthma (n=143)	Variable	T2D Alone (n=124)	T2D+Asthma (n=143)
Age (years)	53 (46, 62)	55 (48,61)	Cigarette Smokers	17%	12%
Sex	41%F, 59%M	59%F, 41%M *	SBP (mmHg)	128 (118, 142)	128 (120, 138)
Total Chol (mg/dl)	177 (144, 205)	172 (151, 196)	DBP (mmHg)	76 (68, 84)	77 (70, 83)
HDL Chol (mg/dl)	39 (32, 48)	41 (34, 48)	Hispanic Ethnicity	67%	60%

* $p<0.01$.

unexpected, beneficial interaction between diabetes and asthma, an effect of ethnicity, or it may reflect an artifact of a restricted data set.

404 MORTALITY DIFFERENTIALS IN U.S. CHINESE AND JAPANESE NATIVES AND IMMIGRANTS COMPARED TO RESPECTIVE COUNTRIES OF ORIGIN: 2003-2011

K Hastings, D Boothroyd, K Eggleston, M Cullen, L Palaniappan. *Stanford University, Oakalnd, CA*

10.1136/jim-d-15-00013.404

Purpose of Study With immigration and minority populations rapidly growing in the U.S, it is critical to assess how these populations fare when living in host countries. Our aim is to be the first study to evaluate how nativity status may influence mortality outcomes for different Asian subgroups (yet often categorized in a single race group), Chinese and Japanese Americans, and how these rates compare to respective countries of origin.

Methods Used We used 2003–2011 U.S. mortality records obtained from the National Center for Health Statistics and reported causes of death for Chinese and Japanese decedents by nativity status and sex, in comparison to country of origin mortality records (Hong Kong and Japan) using the WHO Mortality database for the same years. Age-standardized mortality rates were calculated for decedents 25 years and older and standardized to 2000 WHO standard population. Life expectancy and trends from 2003–2011 were also shown.

Summary of Results All-cause mortality rates were highest in the country of origin, intermediate for foreign-born, and lowest for U.S. born Asian subgroups. These patterns were also shown for other major causes of death such as cancer and stroke, except for heart disease. Heart disease mortality rates were either similar or slightly increased across nativity groups and country of origin for both subgroups, indicating a disproportionate mortality burden due to heart disease for U.S-born decedents. Life expectancy and median age of death were shown to be higher as acculturation (nativity status as a proxy) in the US increased (i.e. US-born > foreign-born > country of origin) for Chinese, but Japanese foreign-born decedents had the lowest median age of death compared to all other groups.

Conclusions Findings uncover the importance that nativity status may play for mortality outcomes, and further demonstrates mortality heterogeneity within and between Asian subgroups. More research would help to understand how childhood exposures, socioeconomic status, self-selected migration, and acculturation interact to explain mortality differences between these subgroups.

405 PHYSICAL ACTIVITY, BODY FATNESS, AND VISCERAL ADIPOSITY IN OVERWEIGHT LATINO AND NON-LATINO ADULTS

NA Cameron,[1] J Godino,[2,3] J Nichols,[3] D Wing,[3] L Hill,[3] K Patrick[3,2]. *[1]UC San Diego School of Medicine, La Jolla, CA; [2]UC San Diego, La Jolla, CA; [3]UC San Diego, La Jolla, CA*

10.1136/jim-d-15-00013.405

Purpose of Study Although several studies have reported associations between moderate to vigorous physical activity (MVPA), body fatness, and VAT, the extent to which associations differ among Latinos and non-Latinos remains unclear. The present study evaluated the associations between body composition and MVPA in Latino and non-Latino adults.

Methods Used An exploratory, cross-sectional analysis was conducted using baseline data collected from 298 overweight adults enrolled in a 12-month randomized controlled trial that tested the efficacy of text messaging to improve weight-related outcomes. MVPA was assessed objectively using waist-worn accelerometry; body fatness was assessed by DXA, and VAT was estimated using DXA-derived software (GE CoreScan. GE, Madison, WI). Participants with less than 5 days of accelerometry data or missing DXA data were excluded. Multivariable linear regression assessed associations between body composition and MVPA, defined as percentage of time in MVPA, bouts of MVPA (time per bout ≥10 min), and non-bouts of MVPA (time per bout <10 min), number of bouts, time per bout, and meeting the 150-minute MVPA guideline. The modifying influence of ethnicity was modeled with a multiplicative interaction term.

Summary of Results A total of 236 participants (96 Latinos, 140 non-Latinos) had complete data. Participants were 22% male, had a mean age of 43 years and mean BMI of 32.55 kg/m^2. Each measure of MVPA (except time per bout) was negatively associated with body fatness, whereas only percentage of time in MVPA and non-bouts of MVPA were negatively associated with VAT (all adjusted for age, sex and ethnicity, and $p<0.05$). The associations of percentage of time in MVPA, number of bouts and meeting guidelines with body fatness were stronger in non-Latinos than in Latinos, but ethnicity did not influence associations with VAT (all adjusted for age and sex, and significant interaction terms $p<0.05$).

Conclusions In this sample, MVPA was associated with lower levels of body fatness and VAT. Additionally, a given increase in MVPA was associated with a larger decrease in body fat in non Latinos compared to Latinos.

406 PSYCHOSOCIAL INDICATORS AND PHYSICAL ACTIVITY AND FUNCTIONING IN A COHORT OF COMMUNITY DWELLING OLDER ADULTS

I Lin,[1] D Coon,[2] K O'Connor,[3] M Malek-Ahmadi,[4] J Mohler[1,5,2]. *[1]University of Arizona, Tucson, AZ; [2]Arizona State University, Phoenix, AZ; [3]Banner Sun Health Research Institute, Sun City, AZ; [4]Banner Alzheimer's Institute, Phoenix, AZ; [5]University of Arizona, Tucson, AZ*

10.1136/jim-d-15-00013.406

Purpose of Study Psychosocial factors have been previously suggested as predictors of physical activity and functioning. This study examined the relationship between the psychosocial indicators of Satisfaction with Life (SWLS), Valuation of Life (VOL), and depressive signs (CESD) with physical activity (RAPA) and functioning (IADL) using data from a cross-section of the Banner Sun Health Research Institute's Longevity Project Cohort, a longitudinal study of

adults aged 50 years and older residing in, or near, Sun City, AZ.

Methods Used Cross-sectional data was obtained for 1149 participants; baseline interview dates ranged from October 2007 to June 2015. Statistical analyses were performed using R. Linear regression models were generated for physical activity and functioning on all psychosocial indicators with their covariates respectively. Correlation coefficients were then generated for parameters with significant associations.

Summary of Results VOL was significantly associated with RAPA ($p<0.0001$) and IADL ($p<0.0001$) after adjustment (covariates: total number of medical conditions, age, sex, education, and CESD), while SWLS demonstrated no association with RAPA ($p=0.43$) or IADL ($p=0.62$) after covariate adjustment in linear regression models. Adjusting for total number of medical conditions, age, gender, and education, CESD was found to be significantly associated with RAPA ($p<0.0001$) and IADL ($p<0.001$). VOL was weakly, but significantly correlated to RAPA ($r=0.23$, $p<0.0001$) and IADL ($r=0.31$, $p<0.0001$). Similarly, CESD was weakly and significantly correlated to RAPA ($r=-0.17$, $p<0.0001$), while IADL ($r=-0.15$, $p<0.0001$) was inversely correlated.

Conclusions It is of critical importance to identify new or modify existing interventions to help older adults find pleasure, meaning, purpose, and value in life, regardless of health status. Future work on valuation of life and depression may serve as targets for the promotion of well-being, physical activity, and physical functioning, and consequently healthy aging, in older adults.

407 SAD, ANXIOUS, AND PLANNING FOR THE FUTURE: ARE DEPRESSION AND ANXIETY ASSOCIATED WITH ADVANCE CARE PLANNING?

Y Ramos,[1] R McMahan,[2] R Ramos,[2] S Osua,[2] R Sudore[2]. [1]*University of Washington School of Medicine, Seattle, WA;* [2]*University of California, San Francisco, San Francisco, CA*

10.1136/jim-d-15-00013.407

Purpose of Study Depression and anxiety are associated with decreased participation in medical care. It is unknown whether they are also associated with participation in advance care planning (ACP). Because clinicians may be concerned about discussing ACP with patients who are depressed or anxious, understanding these associations would be important to tailor ACP programs.

Methods Used 356 participants were recruited from San Francisco General hospital. We measured depression (Patient Health Questionnaire) and anxiety (Generalized Anxiety Disorder), categorized into none-to-mild vs. moderate-to-severe. We measured ACP engagement with validated surveys of Behavior Change Processes (e.g., readiness, scores 57–285) and Actions (e.g., document wishes, scores 0–25). Participants were also classified into pre-contemplation behavior stages vs. higher stages (contemplation, preparation, action). We used Chi-square and Mann-Whitney rank sum tests and linear regression.

Summary of Results Mean age of participants was 63 years, 84% were non-white, 44% had limited literacy, and 49% were Spanish-speaking. 16.6 % were depressed and 11.8 % were anxious. Depression was not associated with ACP engagement. However, participants with anxiety had higher Process scores than those without, 164 ± 52 vs. 146 ± 49, $p=0.05$. Action scores were not significantly different. In multi-variate linear regression, controlling for age, gender, literacy, and health status, anxiety was associated with higher ACP Process scores (22.7, CI: 6.8–38.6). Participants with anxiety vs. no anxiety, but not depression, were also more likely to be in a higher behavior change stage than pre-contemplation, 74% vs. 66%, $p=0.03$.

Conclusions Anxiety was associated with ACP engagement, although depression was not. It is unclear whether anxious individuals are more likely to engage in ACP, or whether ACP increases anxiety. Three trials of an ACP intervention are currently underway to investigate these associations further.

408 REASONS FOR DISCHARGE FROM A LARGE OPIOID PRESCRIBING REGISTRY: A RETROSPECTIVE ANALYSIS

MS Novack,[1] J James,[2,1] S Jackson,[2,1] C McKinney,[1] J Merrill,[2,1] J Klein[2,1]. [1]*University of Washington School of Medicine, Spokane, WA;* [2]*Harborview Medical Center, Seattle, WA*

10.1136/jim-d-15-00013.408

Purpose of Study In recent years, the risks of chronic opioid use have become increasingly clear, as highlighted by rising rates of death related to prescription opioid overdose. Recognizing these trends, clinics have instituted safety and monitoring measures and prescribing guidelines. The goal of this study was to identify reasons for discharge from a primary care opioid prescribing registry to better understand clinical factors that lead to cessation of chronic opioid therapy in this new prescribing climate.

Methods Used We conducted a retrospective chart review of patients discharged from the opioid prescribing registry in an urban safety-net teaching clinic between 2010 and 2015. At the beginning of the study period, the clinic implemented a comprehensive strategy to improve the safety of opioid prescribing, including guidelines for discontinuation of therapy. We collected narrative information from the medical record describing the circumstances of registry discharge. Reasons for discharge were then categorized, and a primary reason for discharge was assigned for each patient. Independent review of a 10% sample validated this assignment.

Summary of Results In 2010, 578 patients were receiving regular opioids from the AMC opioid registry. By 2015, 384 of these patients (66%) had been discharged. The five most common primary reasons for discharge were abnormal urine toxicology results (29%), transfer of care (26%), missed appointments (13%), death (10%), and medication multi-sourcing (7%). Discharges for abnormal urine toxicology results suggest provider concerns around diversion, substance use, and medication interactions. Transfers of

care were initiated by both patients and providers, reflecting patient dissatisfaction with changing prescribing policies and provider concern that patients could be better served in other clinical settings. Many patients had multiple reasons for discharge.
Conclusions Discharge from an opioid prescribing registry was common in the years following implementation of a comprehensive clinic policy. While such policies may better assure opioid prescribing safety for patients remaining in care, further research is needed to document outcomes for discharged patients.

409 **CANCELLED**

Neonatology General V
Concurrent Session
8:00 AM
Saturday, January 30, 2016

410 THE CHANGING PATTERN OF PROCEDURES PERFORMED IN NEWBORNS IN THE STATE OF CALIFORNIA

T Stavroudis, T Chavez, PS Friedlich, A garingo, FB Wertheimer, A Lakshmanan. *Center for Fetal and Neonatal Medicine, Division of Neonatal Medicine, Children's Hospital Los Angeles and LAC+USC Medical Center, Keck School of Medicine, University of Southern California, Los Angeles, CA, United States, Los Angeles, CA*

10.1136/jim-d-15-00013.410

Purpose of Study While it is widely recognized that newborns undergo many invasive procedures, there is limited information on the frequency of procedures performed in newborns and whether this has changed over time. Therefore, the objectives of this study are: (1) To describe the most frequent procedures performed in neonates in the State of California from 2006 to 2010 and (2) To determine if there is a statistical difference in the number of procedures performed.
Methods Used We studied data from the California Office of Statewide Health Planning and Development (OSHPD) birth cohort file for the years 2006 to 2010. The most frequent procedures performed were identified using ICD9-CM codes. Bivariate tests were used to compare frequencies of procedures between epochs.
Summary of Results A total of 2,102,290 newborns were identified from 2006 to 2010. Differences in the pattern of procedures performed are summarized in the table. The most frequent procedures (%) were phototherapy (1.8), spinal tap (1.7), venous catherization (0.7), transfusion of packed cells (0.6), and intubation (0.4). All procedures were statistically associated with birth year.
Conclusions Future studies are needed to explore the potential causes for the observed changes in patterns of performed procedures and its impact on newborn provider proficiency in the development and maintenance of practical skills.

411 UTILIZATION PATTERNS OF EXTRACORPOREAL MEMBRANE OXYGENATION IN NEONATES IN THE UNITED STATES 1997–2012

A Song, R Chapman, PS Friedlich, A Lakshmanan. *Children's Hospital Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.411

Purpose of Study Extracorporeal membrane oxygenation (ECMO) remains one of the most critical therapies for newborns in the United States. However, there is limited information on resource utilization patterns of neonates receiving ECMO nationwide. The aim of this study is to determine if utilizations in patients who have received ECMO differs between survivors and non-survivors in neonates and to identify predictors of mortality, length of stay (LOS) and total hospital charges (THC) in neonates receiving ECMO.
Methods Used We conducted a retrospective data analysis of the Kids' Inpatient Database from 1997 to 2012. Weighted variables were provided and applied in the analysis for national estimates. Neonates who underwent ECMO were identified using ICD-9-CM codes (39.65). Bivariate tests were used to compare characteristics of survivors and non-survivors. Multivariable analysis was completed to identify predictors of LOS, THC and mortality.
Summary of Results Among the 5151 cases of ECMO identified in neonates between 1997 and 2012, survival to discharge was 62%. Patients were more likely to be male, white and had Medicaid insurance for both survivors and non-survivors. Survival was associated with longer hospitalization ($p<0.0001$) and lower THC at discharge ($p=0.001$). After adjusting for race, gender, insurance type, hospital characteristics, and common indications of ECMO, mortality was associated with being in the Midwest region compared to Northeast region (OR=1.8, 95% CI 1.3-2.5). Mortality of neonates who were diagnosed with CDH was statistically significant higher compared to non-CDH neonates (OR=2.1, 95% CI=1.5–3.0). LOS (SE) increased by [11(3)] days if living in the Midwest region compared to the West region ($p=0.0002$). Longer LOS was associated with a diagnosis of CDH by [20 (3)] days ($p<0.0001$).
Conclusions We found several factors that could affect the health care utilization while delivering care to high risk neonates. Neonates who received ECMO in certain regions, such as Midwest, were associated with poor survival outcomes as well as increased LOS. CDH neonates had a higher mortality rate among other diagnoses.

412 RESOURCE UTILIZATION FOR NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA IN THE UNITED STATES 1997–2012

A Song,[1] PS Friedlich,[1] R Chapman,[1] R Burke,[2] J Upperman,[2] J Stein,[2] A Lakshmanan[1]. [1]*Children's Hospital Los Angeles, Los Angeles, CA;* [2]*Children's Hospital Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.412

Purpose of Study While it is recognized that congenital diaphragmatic hernia (CDH) in neonates is associated with

significant mortality, there is limited information regarding resource utilization in delivering health care to this high-risk population. The aim of this study is to determine if resource utilization differed for survivors versus non-survivors and to identify predictors of length of stay (LOS) and total hospital charges (THC) for neonates with CDH.

Methods Used We conducted a retrospective data analysis of the Kids' Inpatient Database from 1997 to 2012. KID is a national sample of pediatric discharges from participating hospital of Healthcare Cost and Utilization Project, which is released every three years and available from 1997 to 2012. Weighted variables were provided and applied in analysis of our study. CDH neonates were identified using ICD-9-CM codes (756.6). Bivariate tests were used to compare characteristics of survivors and non-survivors. Hospital characteristics were also included in survival analysis. Multivariable analysis was completed to identify predictors of LOS and THC.

Summary of Results Of the 8,105 CDH neonates identified for the period between 1997 and 2012, mortality was 20%. Statistically significant differences were observed for several variables for survivors versus non-survivors outlined in the table. On multivariable analysis, after adjustment for race, sex, insurance, use of extracorporeal membrane oxygenation (ECMO), co-morbidities, and hospital characteristics, LOS (SE) increased with ECMO use by 37 (2) days while shorter LOS (SE) was associated with treatment in small or medium hospitals. Mortality was associated with female gender (OR=1.4, 95% CI 1.1-1.7) and those treated in urban teaching hospitals (OR=1.9, 95% CI 1.0-3.4).

Conclusions More non-survivors were treated in urban teaching hospitals and required ECMO. Longer LOS was associated with ECMO use and shorter if treated in small or medium hospitals for survivors. We have identified several factors that could affect mortality, LOS and THC in delivering health care to this high-risk population nationwide.

413 EPIDIMIOLOGY OF APPARENT LIFE THREATENING EVENTS (ALTE) IN INFANTS IN CALIFORNIA

ED Deribssa,[1] A Lakshmanan,[2] J Shepherd,[2] PS Friedlich,[2] A Mikhail,[2] A Song[2]. *[1]University of Southern California, Los Angeles, CA; [2]Children Hospital Los Angeles, Los Angles, CA*

10.1136/jim-d-15-00013.413

Purpose of Study: Background Many published studies about Apparent Life Threatening Events (ALTE) are confined to particular facility or single center study. Comprehensive descriptive information on state or national level is limited.

Objective (1) To describe demographic characteristics of infants with ALTE at a state level (2) To describe clinical procedures and discharges of infants with ALTE at a state level.

Methods Used We studied data from California Office of Statewide Health Planning and Development (OSHPD) Emergency Department data for years 2005–2011. Patients with ALTE were identified using ICD-9-CM codes (786.03 Apnea; 770.8 Respiratory problem; 780.2 Syncope; 780.09 Altered consciousness; 780.02 Transient loss of consciousness; 782.5 Cyanosis, 7998.2 ALTE and 765.1 Prematurity). We conducted univariate analysis and bivariate test to investigate the characteristics of ALTE patients less than one year old.

Summary of Results Among 5640 infants identified with an ALTE 56 % of those patients were white and 51% of the patients were males. Government insured was 53% and 37% had private insurance. The mean (SD) age of the patient was 121 (99.5) days at service date. The principal diagnosis for 40% of the patients was apnea and 49% of patients were discharged to home or self-care after diagnosis while 36% were discharged or transferred to a short-term general hospital for impatient care. The mortality rate of ALTE patients is less than 1%. The most frequent procedures are listed in table 1; the most frequent was laboratory testing (venipuncture, CPT code 36415).

Conclusions Most patients who presented with ALTE to the emergency department were white. Apnea was the most frequent primary diagnosis and laboratory testing was the most frequent procedure. Further study should be conducted to determine patterns of resource utilization for this patient population.

414 PATTERNS AND PREDICTORS OF RESOURCE UTILIZATION IN NEONATES RECEIVING EXTRACORPOREAL MEMBRANE OXYGENATION IN THE STATE OF CALIFORNIA FROM 2006-2010

G Chen,[1,2] A Song,[2] A Lakshmanan,[2] PS Friedlich,[2] R Chapman[2]. *[1]University of Southern California, Arcadia, CA; [2]Children's Hospital Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.414

Purpose of Study Extracorporeal membrane oxygenation (ECMO) is an invaluable yet resource-intensive procedure with many indications, each with differing associated costs and outcomes.

Objectives (1) To identify resource utilization patterns amongst neonatal survivors and non-survivors of ECMO in the state of California. (2) To identify factors associated with mortality. 3) To determine predictors of length of stay (LOS) and hospital charges (HC) for neonatal ECMO recipients and identify the impact of primary diagnosis (PD) on these outcomes.

Methods Used Data released by the California Office of Statewide Health Planning and Development (OSHPD) from the years 2006–2010 (birth cohort file) was analyzed. Neonates were classified as individuals ≤28 days old. ECMO use was identified using the ICD-9 code for ECMO, 39.65. Bivariate tests were used to compare characteristics between survivors and non-survivors in addition to LOS/HC and PD. Multivariate (MV) analysis was conducted to determine predictors of LOS and HC.

Summary of Results 263 neonates were identified as having received ECMO from 2006–2010. Amongst those identified, the mortality rate was 35.36%. Survival status was found to be statistically significantly associated with ethnicity, LOS, and a PD of meconium aspiration syndrome (MAS) or hypoplastic left heart syndrome (HLHS). MV regression analysis identified hospital charges, survival

status, race, and insurance payer category (IPC) to be significant predictors of LOS. After adjusting for charges, survival, and IPC, Blacks and Asians were found to have significantly longer LOS (16.42 additional days, SE: 7.2; 18.6 additinal days, SE: 3.9) compared to whites. Similarly, after adjusting for the same variables, death was associated with a shorter stay of 8.8 days (SE: 3.6). In a separate MV analysis, after adjusting for race, IPC, and survival, HC increased by $14882 (SE: 731.4) for every day spent in the hospital.

Conclusions Neonates with MAS who received ECMO were more likely to survive when compared to other ECMO recipients, while the opposite was true for neonates with HLHS. Shorter length of stay and non-Hispanic ethnicity was found to be associated with lower likelihood of survival.

415 HOSPITAL MANAGEMENT OF PATENT DUCTUS ARTERIOSUS IN CALIFORNIA

S Ngo,[1] J Profit,[2,3] J Gould,[2,3] HC Lee[2,3]. *[1]University of California, Berkeley, Berkeley, CA; [2]Stanford University, Palo Alto, CA; [3]California Perinatal Quality Care Collaborative, Palo Alto, CA*

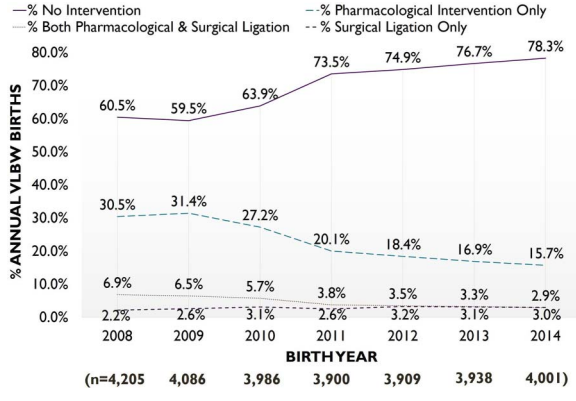
10.1136/jim-d-15-00013.415

Purpose of Study To examine yearly trends of patent ductus arteriosus (PDA) diagnosis and treatment patterns in very low-birthweight (VLBW) infants.

Methods Used In this retrospective cohort study of 28,025 VLBW (<1500 g) births between 2008 and 2014 in 134 California hospitals, we evaluated PDA diagnosis and treatment patterns. Infants were either inborn or transferred in within 2 days after delivery, and had no congenital abnormalities. Four aggressiveness levels for treatment assessed by birth year were: none, pharmacological (indomethacin or ibuprofen), both pharmacological intervention and surgical ligation, or ligation only.

Summary of Results PDA was diagnosed in 42.8% (12,002/28,025) of infants, with a decrease in incidence from 49.2% of 4,205 infants born in 2008 to 38.5% of 4,001 infants born in 2014. Treatment was given to 30.5% of patients. Between 2008 and 2014, the annual proportion of infants who received pharmacological intervention (30.5% vs. 15.7%) or both pharmacological intervention and surgical ligation (6.9% vs. 2.9%) decreased while infants who were not treated (60.5% vs. 78.3%) or received primary ligation (2.2% vs. 3.0%) increased (Figure 1).

Conclusions There is an increasing trend towards not treating patients diagnosed with PDA compared to more aggressive treatments, either pharmacologically or by surgical ligation.



Abstract 415 Figure 1

Hospital Aggressiveness in Patent Ductus Arteriosus (PDA) Management of Very Low-Birthweight (VLBW) Infants (<1500 g) Across 134 California Hospitals, 2008–2014 (N=28,025).

416 EVALUATION OF BIRTH ATTENDANT COMPLIANCE WITH RATIONAL IMMEDIATE NEBORN CARE AND NEONATAL ASPHYXIA INTERVENTION PRACTICES IN AN INDIAN PEDIATRIC HOSPITAL

C Orlando, A Allen, M Parkinson, D Shapiro, B Fassl. *University of Utah School of Medicine, Centerville, UT*

10.1136/jim-d-15-00013.416

Purpose of Study Birth asphyxia is one of the most common causes of child mortality accounting for 200,000 or more neonatal deaths in India each year. Simple interventions immediately after delivery can prevent birth asphyxia. The purpose of this study was to evaluate birth attendance compliance with evidence-based interventions for immediate newborn care following completion of a standardized neonatal care and resuscitation program (Helping Babies Breathe – HBB).

Methods Used This study took place in the Mota Fofalia Pediatric Center in Gujarat, India. All birth attendants completed a 6 hour standardized newborn resuscitation training program according to the HBB curriculum in March-April of 2014. All participants achieved competency per HBB standards. Trained observers observed deliveries to determine compliance with key newborn care quality measures following HBB training between Nov 2014 and July 2015 using a validated newborn care data collection instrument. Main outcome measures included appropriate: (1) Preparation of delivery room and reusucitaiton equipment; (2) Immediate care (drying, suctioning, stimulation); (3) assessment of respiratory status; (4) appropriate bag-and-mask ventilation.

Summary of Results A total of 31 deliveries were observed. Resuscitation equipment was present in 23/31 (74%) and checked for functionality in 11/31 (36%). Immediate newborn care was appropriate in 30/31 cases (97%). Spontaneous breathing/crying occurred within 30 seconds of delivery in all but one newborn. This newborn did not receive bag-and-mask ventilation even though spontaneous crying did not occur for over one minute.

Conclusions Compliance with basic evidence-based neonatal resuscitation procedures following HBB training continues was appropriate. Birth asphyxia recognition and management continue to be inappropriate.

417 SERIAL FOLLOW UP OF MENTAL HEALTH IN LOW-INCOME MOTHERS AFTER NICU DISCHARGE

NG Lynch, AM Yeh, A Diamond, N Flores, J Eshagian, R Polcyn, A Pham, M Williams, DL Vanderbilt, PS Friedlich, A Lakshmanan. *Center for Fetal and Neonatal Medicine, Division of Neonatal Medicine, Children's Hospital Los Angeles and LAC+USC Medical Center, Keck School of Medicine of University of Southern California, Los Angeles, CA*

10.1136/jim-d-15-00013.417

Purpose of Study: Background The prevalence of maternal depression after preterm birth is widely recognized and the Patient Health Questionnaire (PHQ-2 and PHQ-9) has been validated to screen for this condition. However, there is limited information on the follow up of women after initial screening.

Objective (1) Describe the association of the PHQ-9 with positive screening on the PHQ-2 in a population of low-income mothers of preterm infants after NICU discharge and (2) To identify health-related social predictors of depression.

Methods Used: Design/Methods We administered a 120-item survey to mothers of preterm infants attending a high-risk infant follow up program. Our primary outcome was a positive screen for depression determined by a score >3 on the PHQ-2. We then followed the women >6 months after initial screening with the PHQ-9. In multivariable logistic regression, we estimated the adjusted odds of depression in association with health-related social predictors.

Summary of Results Of 153 participants (85% response rate): 74% of participants were Hispanic and 63% reported an annual household income <$20,000. 32% of mothers screened positive for depression based on the PHQ-2. On follow up of 47 women, participants reported no to mild depression. The median (IQR) PHQ-9 score was 2 (1–3) [total score=27]. Only 5 (11%) of respondents reported being referred to a therapist or counselor after initial positive screening on PHQ-2. Adjusting for socio-demographics, infant developmental score and co-morbidities including use of medications and technology, financial burden (AOR, 95% CI), 4 (1.4–11.2) and food insecurity (AOR, 95% CI), 3.9 (1.4–11) were significantly associated with an positive screen for depression on the PHQ-2.

Conclusions Follow up of women who screened positive on the PHQ-2 screen demonstrated that all had none to mild depression. We identified health-related social predictors of depression including food insecurity and financial burden, which should be considered with screening.

Neonatology Perinatal Biology II
Concurrent Session
8:00 AM
Saturday, January 30, 2016

418 PRE-ECLAMPSIA AND INFLAMMATORY PRETERM LABOR ALTER THE HUMAN PLACENTAL HEMATOPOIETIC NICHE

KL Ponder,[1] A Bárcena,[3] FL Bos,[2] M Gormley,[3] Y Zhou,[3] K Ona-Vu,[3] M Kapidzic,[3] AC Zovein,[1,2] SJ Fisher[3]. *[1]UCSF, San Francisco, CA; [2]Cardiovascular Research Institute, UCSF, San Francisco, CA; [3]Eli and Edythe Broad Center of Regeneration Medicine and Stem Cell Research, UCSF, San Francisco, CA*

10.1136/jim-d-15-00013.418

Purpose of Study The human placenta is a source of definitive, transplantable hematopoietic stem and progenitor cells (HSPCs). The Runx1 transcription factor is required for the formation of functional HSPCs and is expressed in the mouse placenta. We sought to determine how pre-eclampsia (PE) and inflammatory preterm labor (iPTL) impact HSPC localization and Runx1 expression in the human placenta.

Methods Used We compared HSPC frequency, density, and localization, as well as Runx1 expression, in control placentas from spontaneous preterm labor (sPTL, n=6) versus PE (n=6) and iPTL (n=6) samples. Fixed and frozen tissue sections of the human placenta, including the chorionic plate, were analyzed for $CD34^+$ $CD45^+$ HSPCs by using immunolocalization and confocal microscopy. Runx1 protein expression was detected by immunolocalization and immunoblotting approaches.

Summary of Results HSPCs were rare cell types associated predominantly with the vasculature of placental villi in all samples. In contrast, Runx1 was expressed primarily in the mesenchymal compartment of the chorionic plate and placental villi. PE and iPTL samples were associated with increased HSPC density compared to controls ($P<0.05$), specifically within the chorionic plate. iPTL specimens exhibited additional increases in large vasculature HSPCs, intra-luminal $Runx1^+$ hematopoietic cell populations, and occasional $Runx1^+$ arterial cell clusters.

Conclusions Human placental HSPCs likely arise from hematopoietic niches comprised of $Runx1^+$ mesenchyme and vascular endothelium. Pregnancy complications that result in preterm birth differentially affect placental

HSPCs, with the most significant alterations in HSPC localization seen in iPTL samples. Our novel results regarding the human placenta support previous findings that inflammation positively regulates hematopoiesis. We also present new evidence that hemogenic endothelium may be active at later stages of human fetal development.

419 ADIPONECTIN SUPPLEMENTATION IN PREGNANT MICE IMPROVES GLUCOSE TOLERANCE IN OFFSPRING

M Gossling,[1] FJ Rosario,[2] T Jansson,[2] T Powell[1,2]. [1]*University of Colorado, Aurora, CO;* [2]*University of Colorado, Aurora, CO*

10.1136/jim-d-15-00013.419

Purpose of Study Childhood obesity may have its origin during fetal life. Neonates born to obese pregnant women are more commonly large for gestational age and have glucose intolerance. This phenotype is associated with an increased lifetime risk of metabolic syndrome. Obese mothers often have low circulating levels of adiponectin, which is associated with increased fetal growth. We hypothesized that adiponectin supplementation during pregnancy would decrease weight gain and improve glucose tolerance in 3-month-old offspring born to obese mice.

Methods Used Female C57BL/6J mice at 13 weeks of age were fed a control diet or a high-fat/high-sugar pelleted diet supplemented by ad libitum 20% sucrose solution (HF/HS). After 4–6 weeks, HF/HS animals (+25% body weight, OB phenotype) and control animals were mated. At E14.5 all dams were infused with either PBS or adiponectin (0.62 ug/g/d). Dams were allowed to deliver and male offspring were studied at 3 months of age (N=36). Body weight was measured. Serial serum glucose levels after a glucose load were measured (GTT, 90 min). Fasting serum insulin levels and serum triglyceride levels were also measured.

Summary of Results Three-month-old male offspring born to obese dams were larger than offspring born to control diet dams (+25%, $p<0.0001$). As hypothesized, male offspring from obese dams receiving adiponectin infusion during pregnancy did not differ in weight compared to offspring from control diet dams. Additionally, three-month-old male offspring had impaired glucose tolerance ($p<0.001$), elevated serum insulin levels ($p<0.01$), and elevated serum triglyceride levels ($p<0.01$) compared to offspring from control diet dams. In contrast, male offspring of adiponectin-supplemented dams did not differ in these measurements compared to offspring of control diet dams.

Conclusions Adult males, who were born to obese mothers, were larger and had glucose intolerance compared to controls. Adiponectin supplementation in obese dams, during pregnancy, eliminated both excessive weight gain and glucose intolerance in adult offspring. Therefore, we speculate that adiponectin may be a potential therapeutic agent for improving the metabolic profile of offspring whose mothers are obese.

420 SYNCHRONOUS ABERRANT CEREBELLAR AND OPERCULAR DEVELOPMENT IN FETUSES AND NEONATES WITH CONGENITAL HEART DISEASE

A Wong,[2] T Chavez,[1] H Lai,[3] L Paquette,[1] A Panigrahy[4]. [1]*University of Southern California, Los Angeles, CA;* [2]*New York Medical College, Valhalla, NY;* [3]*University of Southern California, Los Angeles, CA;* [4]*University of PIttsburgh, Pittsburgh, PA*

10.1136/jim-d-15-00013.420

Purpose of Study Subjects with congenital heart disease (CHD) demonstrate problems with multi-domain cognitive control of unknown etiology. Cingo-opercular and cerebellar brain networks are known to be critical in multi-domain cognitive control including language function. Little is known about the comparative structural growth trajectories of the cerebellum and operculum in CHD patients. The aim of this study is to compare and contrast the longitudinal trajectory of opercular and cerebellar structural growth in fetuses and neonates with CHD compared to control cases without CHD.

Methods Used Subjects were prospectively enrolled from January 2011 to June 2015. Serial fetal (1.5T) and postnatal pre and post-operative (3T) MRI imaging were completed in the same CHD patients. Comparable cross sectional imaging was performed in the non-CHD patients both in the fetal and neonatal period. Like fetal SSFE and neonatal T2 images were used for manual linear cross sectional measurement. Multivariable (MV) analysis was used for adjustments and curve fitting.

Summary of Results A total of 62 mothers were prospectively enrolled, with 11 CHD fetuses and 51 non-CHD fetuses with a total of 80 scans performed and 35 serial scans (9 in the non-CHD group) in the same patient. MV analysis, adjusting for gestational age, demonstrated altered brain trajectories in selected cerebellar and opercular measurements in the CHD patients compared to the non-CHD group (Table 1). The slope of the trajectory measurement for both the opercular and cerebellar structures were similar suggesting synchronous aberrant development in the CHD patients (Figure 1).

Conclusions Synchronous altered early structural development of the cerebellum and the operculum are present in patients with CHD. These results suggest that cingulo-opercular and cerebellar cognitive control brain network are at risk in patients with CHD. Further correlative longitudinal functional connectivity studies and behavior outcomes studies are warranted in patients with CHD.

421 SERIAL CEREBELLAR AND OPERCULAR STRUCTURAL DEVELOPMENT OF FETUSES AND NEONATES WITH CONGENITAL HEART DISEASE (CHD) CORRELATED WITH EARLY NEURODEVELOPMENTAL OUTCOMES

A Wong,[2] S O'Neil,[5] T Chavez,[1] H Lai,[3] A Panigrahy,[4] L Paquette[1]. [1]*University of Southern California, Los Angeles, CA;* [2]*New York Medical College, Valhalla, NY;* [3]*University of Southern California, Los Angeles, CA;* [4]*University of PIttsburgh, Pittsburgh, PA;* [5]*University of Southern California, Los Angeles, CA*

10.1136/jim-d-15-00013.421

Purpose of Study Abnormal development of the operculum and cerebellum has been noted in patients with CHD.

Cingo-opercular and cerebellar brain networks are known to be critical in multi-domain cognitive control including language function and motor components of speech. The aim of this study is to correlate serial fetal and neonatal structural measurements of the operculum and cerebellum with early neurodevelopmental outcomes in CHD patients.

Methods Used CHD fetuses were prospectively enrolled from January 2011 to June 2015. Serial fetal (1.5T) and postnatal pre- and post-operative (3T) MRI were completed in the CHD patients. Neurodevelopment was assessed via Battelle Developmental Inventory, Second Edition at 9 to 37 months of age. Multivariate regression was used for statistical analysis. Gestational age (GA) was corrected for with additional analysis.

Summary of Results A total of eleven CHD fetuses were enrolled who underwent serial pre- and postnatal imaging and infant neurodevelopmental testing. In the CHD group, when adjusted for GA, an enlarged pre-op bilateral operculum width and right operculum width correlated with a lower performance on the Expressive Communication subtest. Similar significant correlations were delineated for the left operculum outer width and right operculum length and the Self-Care Score. Additionally, increased cerebellum inferior vermis width, when corrected for GA, was predictive of a decreased performance in the Receptive Communication, Attention and Memory scores..

Conclusions Altered fetal and neonatal opercular and cerebellar measurements may be predictive of specific neurodevelopmental abnormalities in CHD patients. These results suggest that the cingulo-opercular and cerebellar cognitive control brain network are at risk in CHD patients. Further studies are warranted to determine whether opercular and cerebellar structural assessment can prognosticate neurodevelopmental risks among CHD patients.

422 ANTENATAL VITAMIN D PRESERVES PLACENTAL WEIGHT AND VESSEL DENSITY AND FETAL GROWTH AFTER INTRA-AMNIOTIC ENDOTOXIN EXPOSURE

MW Cookson,[1,2] R Sharon,[2] G Seedorf,[2] B Dodson,[2] SH Abman,[2] E Mandell[2]. [1]*University of Colorado, Denver, CO;* [2]*Univ. of Colorado, Aurora, CO*

10.1136/jim-d-15-00013.422

Purpose of Study The placenta is a major site for vitamin D metabolism. Antenatal intra-amniotic (IA) endotoxin (ETX) exposure in fetal rats causes high neonatal mortality and late morbidity, including abnormal lung structure and pulmonary hypertension during infancy. The biologically active form of vitamin D, 1,25-dihydroxyvitamin D_3 ($1,25\text{-}(OH)_2D_3$), improves survival and lung structure in infant rats after IA ETX. Whether the protective effects of IA $1,25\text{-}(OH)_2D_3$ treatment are due to direct effects on the fetus or improved placental vascular development remain unknown. We aim to determine if $1,25\text{-}(OH)_2D_3$ treatment could improve placental vascularity after IA ETX exposure during late gestation in pregnant rats.

Methods Used Fetal rats were exposed to ETX (10 mg), ETX+$1,25\text{-}(OH)_2D_3$ (1 ng/ml), $1,25\text{-}(OH)_2D_3$ (1 ng/ml), or saline via IA injection at E20 and delivered two days later. To assess placental vascular development, histologic sections from the placenta were stained for CD31 and vessel density per high power field (HPF) was determined and analyzed using Matlab software.

Summary of Results IA ETX reduced placenta and newborn birth weight by 22% and 17%, respectively, when compared to controls (placental weight: 0.66g v. 0.52g; $p< 0.001$; birth weight: 4.82g vs. 5.69g; $p<0.001$). IA $1,25\text{-}(OH)_2D_3$ treatment increased birth weight by 10% in ETX exposed pups (5.34g vs. 4.82g; $p<0.005$). Placental vessel density was reduced after IA ETX exposure by 24% in comparison with controls (1114 (+/–40.65) v. 847 (+/–16.81) vessels per HPF; $p<0.05$). Treatment with IA $1,25\text{-}(OH)_2D_3$ increased placenta vessel density 2-fold after ETX exposure (847 (+/–16.81) v. 1739 (+/–95.88); $p<0.0001$), and increased vessel density in placentas from saline controls by 31% (1114 (+/–40.65) v. 1619 (+/–67.89); $p<0.001$).

Conclusions IA ETX decreases placental and pup weight at birth. Antenatal $1,25\text{-}(OH)_2D_3$ improved newborn rat weight and placental vessel density after IA ETX exposure. We speculate that $1,25\text{-}(OH)_2D_3$ treatment improves dysregulated angiogenesis in the placenta caused by ETX exposure and can enhance placental function and fetal somatic and lung growth in experimental chorioamnionitis.

423 THE USE OF HEPATOBILIARY SCINTIGRAPHY IN DIAGNOSING BILIARY ATRESIA IN INFANTS WITH CONJUGATED HYPERBILIRUBINEMIA WHO RECEIVED PARENTERAL NUTRITION

K Barseghyan,[1,2] C McLean,[2] T Chavez,[2] R Ramanathan[1]. [1]*LAC+USC, Los Angeles, CA;* [2]*Children's Hospital Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.423

Purpose of Study Hepatobiliary Scintigraphy (HS) is used to aid in the diagnosis of Biliary Atresia (BA) in full-term infants with conjugated hyperbilirubinemia (CH). There is little information on the utility of the HS scans in premature infants with CH and infants with parenteral nutrition associated cholestasis (PNAC). The purpose of this study was to assess if HS is useful in differentiation between BA and PNAC.

Methods Used Retrospective data collection and analysis on infants who developed PNAC and had HS performed during their stay in our neonatal intensive care unit from 2004 to 2014.

Summary of Results A total of 20 patients had the HS; 2 patients were confirmed to have BA. There were no statistically significant differences between the patients with BA versus PNAC patients in demographics; however, large effect sizes were noted. HS had 100% sensitivity, 17% specificity, positive predictive value of 12% and a negative predictive value at 100% with an overall capability of correctly classifying 25% of patients with BA. The Receiver Operating Characteristics Area Under Curve (AUC) was 0.58. Covariates (birthweight (BW), gestational age (GA) at birth) didn't significantly add to the model. Post hoc analysis showed 0.54 power.

Conclusions These data indicate that the ability of HS in diagnosing BA is poor (AUC=0.58, "Poor discrimination") in a population of preterm neonates with PNAC. Although

Abstract 423 Table 1 Baseline Demographics

	No BA n=18	BA n=2	Total n=20	Effect Size	p-value
GA at Birth (weeks) median [IQR]	30 6/7 (28 4/7, 36 1/7)	28 2/7 (25 4/7, 30 6/7)	30 6/7 (28 1/7, 35 1/7)	0.82*	0.26
BW (grams)	1481 (995, 1796)	1325 (630, 2020)	1481 (972.5, 1908)	0.33	0.71
Days on PN	29 (18, 51.5)	40.5 (20, 61)	29 (20, 56)	–0.21	0.83
Highest Direct Bilirubin Level (mg/dL)	8.85 (5.6, 12.1)	16.1	9 (5.6, 12.6)	–	0.17
Direct Bilirubin Level during scan (mg/dL)	4.85 (3.8, 7.4)	4.2 (3.8, 4.6)	4.7 (3.8, 7.2)	0.53	0.49
GA during scan (weeks)	40 5/7 (37 6/7, 44 5/7)	45 0/7 (39 4/7, 50 3/7)	40 6/7 (37 6/7, 44 6/7)	–0.67	0.38
Day of life during scan	63 (50, 77)	117.5 (61, 174)	63 (50.5, 82.5)	1.04*	0.38
Feeds during scan (ml/kg/day)	145 (100, 150)	90 (0, 180)	145 (95, 155)	0.47	0.95
Days on feeds before the scan	26.5 (19, 46)	77 (0, 154)	26.5 (18, 48)	0.84*	0.89

– Incalculable.
*Large effect Size.

there is 100% sensitivity, the poor specificity should be acknowledged when utilizing HS to diagnose BA. Further research encompassing a larger sample size is needed to determine whether these diagnostic classifications and baseline demographic effect sizes persist.

Pulmonary and Critical Care II
Concurrent Session
8:00 AM
Saturday, January 30, 2016

424 PRESENTING ILLNESS AND MORTALITY OUTCOMES IN PATIENTS INTUBATED IN THE EMERGENCY DEPARTMENT

J Yeaton, AE Pickering, T Durns, R Miller, Z Roward, L DeLuca. *University of Arizona, Tucson, AZ*

10.1136/jim-d-15–00013.424

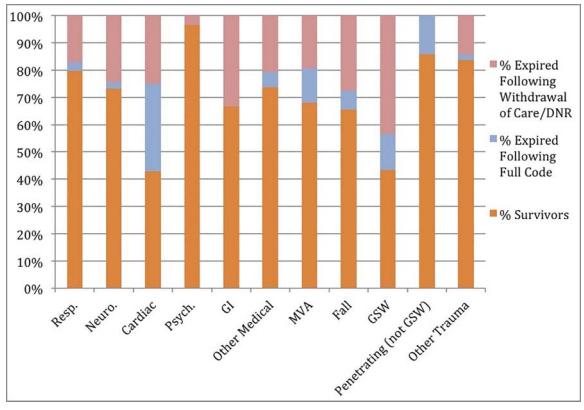
Purpose of Study To characterize the influence of presenting complaint on mortality for patients intubated in the ED.

Methods Used This study was performed in a Level I Trauma center with an annual census of 77,000. A cohort of patients intubated in the ED was identified and grouped into those who survived to discharge (SURVIVED), those who died after being designated DNR or having care withdrawn (WDCARE) per family wishes, and those who died after full resuscitative efforts (CODED). Patients were stratified into traumatic and medical complaints and mortality was compared between groups.

Summary of Results 533 patients were included. Overall 72.8% (388) SURVIVED, 7.5% (40) CODED, and 19.7% (105) died after DNR or WDCARE. Of the 241 trauma patients, 10% (24) CODED and 21.2% (51) died after DNR or WDCARE. Of the 292 patients intubated after presenting with medical complaints, 5.5% (16) CODED and 18.5% (54) died after DNR or WDCARE. For trauma patients, gunshot wounds (GSW) and falls had the highest mortality at 56.7% and 34.5%, respectively. For medical patients, 57% of patients with cardiac complaints and 33% of gastrointestinal complaints expired. Psychiatric complaints had the lowest mortality at 3.5%.

Conclusions Patients who were intubated in the ED for traumatic injuries had higher mortality rates than those intubated for medical concerns. GSW and cardiac patients had the highest rates of death among traumatic and medical presentations, respectively. GSW patients were also the most likely to expire following withdrawal of care.

Mortality Outcome by Presenting Complaint.



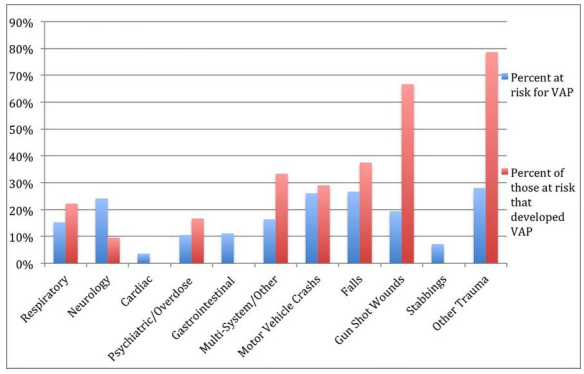
Abstract 424 Figure 1

425 THE EFFECT OF PRESENTING COMPLAINT ON THE RISK OF DEVELOPING VENTILATOR-ASSOCIATED PNEUMONIA FOR PATIENTS INTUBATED IN AN ACADEMIC EMERGENCY DEPARTMENT

AE Pickering,[1] J Yeaton,[1] T Durns,[1] R Miller,[1] Z Roward,[1] L DeLuca[2,3,1]. *[1]University of Arizona Tucson, Tucson, AZ; [2]Banner University Medical Center, Tucson, AR; [3]Arizona Emergency Medicine Research Center, Tucson, AZ*

10.1136/jim-d-15-00013.425

Purpose of Study Ventilator associated pneumonia (VAP) increases ICU length of stay and mortality. Eckert found that 26% of trauma patients intubated in the ED develop VAP as compared to 6.5% of those intubated in the ICU. Green demonstrated that 70% of critical patients were intubated pre-hospital or in the ED and 18.2% remained in the ED for more than 4 hours.



Abstract 425 Figure 1

Objective To characterize the effect of presenting complaint on VAP risk and prevalence for patients intubated in the ED.

Methods Used A retrospective study was performed using a QI database of patients intubated in the ED. "At-risk for VAP" was defined as intubated >48 hours, with no significant abnormality on chest x-ray in the first 48 hours. "At-risk" patients were identified as VAP positive if they had a new persistent infiltrate on CXR with temperature outside 36–38C, and leukocyte count outside 4,000–12,000, on chart review.

Summary of Results 539 patients were included in the cohort. 244 presented with traumatic complaints, of these 25% (60) were found to be at risk for VAP and 45% (27) of these developed VAP. 295 patients had medical presenting complaints, of these 16% (47) were at risk for VAP and 17% (8) of these developed VAP. Trauma of unknown or less prevalent mechanism was categorized as Other Trauma, including TBI's and multi trauma. 28% of this group was at risk for VAP and 79% of these were VAP positive. 19% of gunshot wounds were at risk and 67% developed VAP.

Conclusions Patients with traumatic injury were at higher risk for VAP and developed VAP more frequently.

426 GENETIC NETWORK IDENTIFICATION, INTERACTION, AND VARIABLE EXPRESSION IN MUC5B VARIANT IDIOPATHIC PULMONARY FIBROSIS

K Lind, A Walts, A Thor, I Yang, D Schwartz. *University of Colorado School of Medicine, Greenwood Village, CO*

10.1136/jim-d-15-00013.426

Purpose of Study Idiopathic pulmonary fibrosis (IPF) is a complex disorder characterized by pulmonary fibrosis that leads to significant hypoxemic respiratory insufficiency and, ultimately, significant morbidity and mortality. Although there is currently no known etiology of IPF, familial clustering and association of IPF with systemic genetic syndromes suggest that genetics have a critical role in the development of IPF. We have previously shown that the *MUC5B* promoter variant (rs35705950) is strongly associated with sporadic and familial IPF but the exact mechanism is unknown. A previously published genome-wide association study identified 10 loci of susceptibility (encompassing 66 genes) involved in host defense, cell-cell adhesion, and DNA repair. We hypothesize that these genes are expressed and interact as a network in IPF.

Methods Used In this study, we identified the most promising network from the previously-identified loci by Ingenuity Pathway Analysis. In this network, we selected four genes- AZGP1, OBFC1, DISP2, and the Androgen Receptor- to serve as representatives of this network and compared expression of these genes in healthy and IPF tissue by immunohistochemistry (IHC).

Summary of Results These four genes were notably down-regulated in diseased IPF tissue with both wild-type and heterozygous MUC5B variant as compared to healthy lung tissue. Surprisingly, the Androgen Receptor appeared to be strongly expressed in the *MUC5B* variant and in healthy tissue but lost expression in all other diseased tissue.

Conclusions This data suggests that there is an overall decreased expression of this network in IPF that is somehow altered by the *MUC5B* variant. Further studies of this network will be crucial to elucidate the mechanism of the *MUC5B* variant's effect on the development of IPF.

427 *IN VIVO* MEASUREMENT OF MOUSE ENDOTHELIAL SURFACE LAYER IN SURFACE CORTICAL MICROVASCULATURE

MJ Perez, J Ford, Y Yang, E Schmidt. *University of Colorado SOM, Denver, CO*

10.1136/jim-d-15-00013.427

Purpose of Study Sepsis, a systemic inflammatory response to infection, is the most common cause of in-hospital mortality in the USA. Sepsis survivors often demonstrate chronic neurocognitive dysfunction. However, little is known about the mechanisms underlying the development of neurocognitive dysfunction during sepsis. We have previously shown that septic lung and kidney injury is mediated by degradation of the endothelial surface layer (ESL), a thick glycosaminoglycan-rich layer lining the pulmonary and glomerular microcirculation. We postulate that degradation of neurovascular ESL may contribute to septic neurocognitive dysfunction. To pursue this hypothesis, we adapted a surgical approach to *in vivo* brain confocal microscopy that allows for direct visualization of the ESL in surface cortical microvasculature.

Methods Used We placed a cranial window in anesthetized mice. After allowing for 4 days of recovery, we re-anesthetized mice and administered an intravenous bolus of FITC-labeled 150 kDa dextran, followed by TRITC-labeled 40 kDa dextran. Using an in-focus frame, we identified at least 3 surface cortical microvessels (<20 μm diameter). We performed *in vivo* confocal microscopy through the cranial window, simultaneously measuring TRITC (inclusive of the ESL) and FITC (exclusive of the ESL) microvessel widths. Assuming equal ESL thickness at both edges of the vessel, the ESL size is defined by one-half the difference between TRICT- and FITC-dextran vascular widths. After measurement of baseline ESL thickness, mice were injected with lipopolysaccharide (LPS) to model sepsis and ESL was measured every 30 mins.

Summary of Results The baseline ESL thickness of surface cortical microvessels was 0.51 μm, a size less than that which we have previously observed in lungs (1.67 μm) but similar to that observed in systemic vessels (0.6–0.7 μm). Endotoxemia led to a rapid loss of ESL thickness (0.08 μm vs. 0.71 μm 30 min after LPS or saline, respectively).
Conclusions In conclusion, by use of surgical placement of a cranial window, we have developed an experimental model that allows for the detailed observation of the neurovascular ESL. Using this model, we have demonstrated that the neurovascular ESL thickness is approximately 0.51 μm in thickness and may be degraded during endotoxemia, similar to other vascular beds of clinical relevance in sepsis.

428 EXPLORING THE ANTI-INFLAMMATORY EFFECTS OF THE AMYLOIDOGENIC HEXAPEPTIDE, AMYLIN28–33, IN SEPSIS

S Mahapatra,[3,2] M Kurnellas,[1] J Rothbard,[1] D Cornfield,[3] L Steinman[1]. [1]*Stanford University Medical Center, Palo Alto, CA;* [2]*University of Nebraska Medical Center, Omaha, NE;* [3]*Stanford University Medical Center, Stanford, CA*

10.1136/jim-d-15-00013.428

Purpose of Study Traditionally, the accumulation of amyloidogenic proteins in conditions like multiple sclerosis is considered pathologic. However, in a murine model of multiple sclerosis, i.e. experimental autoimmune encephalomyelitis, amyloidogenic proteins, such as major prior protein, serum amyloid protein, and amylin, were anti-inflammatory. Whether these molecules can modulate inflammation in sepsis remains unknown. We hypothesized that amylin attenuates the systemic inflammatory response in a murine model of sepsis.
Methods Used Mice were treated with vehicle (control) or amylin 28–33 (20 μg) at 12 hours and 6 hours prior to administration of intraperitoneal (IP) lipopolysaccharide (LPS, 20 mg/kg). Illness severity scores, weight loss, and survival data were recorded every 6 hours over a 3-day study period. In addition, levels of pro- (IL-6, TNF-alpha, IFN-gamma) and anti-inflammatory (IL-10) cytokines were measured via ELISA at 1, 3, 6, 12, and 24 hours after (IP) LPS in both groups.
Summary of Results Overall mortality at 3 days was decreased by 50% in amylin pre-treated mice compared to control. Moreover, illness severity was lower in amylin pre-treated compared to control mice, with lower peak sepsis scores and more rapid return to baseline ($p<0.05$, controls vs. amylin for all parameters). Consistent with illness severity scores, peak levels of the pro-inflammatory cytokines, IL-6, IFN-gamma, and TNF-alpha were lower ($p<0.05$) in amylin pre-treated mice compared to controls. Interestingly, while IL-10 levels were increased for 1 hour in control mice, IL-10 levels remained elevated at 3 hours in the amylin pre-treatment group.
Conclusions In a murine model of sepsis, pre-treatment with amylin 28–33 reduced mortality, disease severity, duration of illness and constitutional symptoms compared to controls. Dynamic changes in cytokine levels were consistent with the observations in whole animals as amylin pre-treatment decreased pro- and increased anti-inflammatory serum concentrations of cytokines. We conclude that amylin 28–33 possesses previously undescribed anti-inflammatory properties, perhaps via a sustained increase in IL-10 levels.

429 UNIQUE RAT STRAIN THAT SURVIVES BREATHING HYPEROXIA ALSO RESISTS OBESITY

K Repine, PV Wilson, N Elkins, J Newman, Q He, KA Baer, J Torres, A Newman, A Fernandez-Bustamante, JE Repine. *Webb-Waring Center, University of Colorado Anschutz Medical Center, Aurora, CO*

10.1136/jim-d-15-00013.429

Purpose of Study While studying the effects of continuously breathing pure oxygen (hyperoxia) on acute inflammatory oxidative edematous lung injury ("ARDS") in Sprague-Dawley rats, a single control rat unexpectedly survived while all (>1000) control rats died after ~66 hours. By breeding this unusual hyperoxia tolerant ("tolerant") rat with control rats, and then breeding the tolerant offspring, we created a new strain of rats that survive indefinitely in hyperoxia. Tolerant rats also develop less lung inflammation and oxidative stress after hyperoxia. Because of emerging interest in inflammation, oxidative stress, and heme oxygenase-1 (HO-1)—a multidimensional anti-inflammatory antioxidant in ARDS and obesity—we evaluated weight gain and HO-1 expression in tolerant rats.
Methods Used Rats were fed a standard diet *ad libitum* and weighed. Lavage neutrophils and protein and nitrotyrosine staining were measured in lungs after hyperoxia for ~52 hours. Alveolar macrophages, bone marrow mononuclear cells, and visceral fat were analyzed for HO-1 (ELISA).
Summary of Results Tolerant rats gained less ($p<0.002$) weight (393+/-9 g vs. 491+/–12 g at 3.5 months and 610 +/–28 g vs. 809+/–18 g at 12 months) than control rats. Tolerant rats also had smaller ($p<0.02$) abdominal girths (16.0+/–0.6 cm vs. 17.6+/–0.3 cm at 3.5 months) than control rats. After hyperoxia, tolerant rats also had less ($p<0.05$) lung lavage PMN ($2.5+/-0.4\times10^6$ vs. $6.3+/-1.1$ $\times10^6$), lung nitrotyrosine staining, and lung lavage protein (1.5+/–0.3 mg/ml vs. 3.6+/–0.3 mg/ml) than control rats. Alveolar macrophages from tolerant rats had higher ($p<0.002$) HO-1 before ($101+/-21$ ng/ml$\times10^6$ cells vs. 28 +/–4 ng/ml$\times10^6$ cells) and after ($45+/-10$ ng/ml$\times10^6$ cells vs. $0.6+/-0.2$ ng/ml$\times10^6$ cells) hyperoxia than control rats. Bone marrow mononuclear cells ($6.0+/-1.1$ ng/ml$\times10^6$ cells vs. $2.8+/-0.6$ ng/ml$\times10^6$ cells, $p=0.07$) and visceral fat (13.8+/–4.9 ng/ml vs. 9.9+/–1.5 ng/ml, $p=0.5$) from tolerant rats had non-significant HO–1 increases compared to control rats.
Conclusions We serendipitously created a novel strain of tolerant rats that resist both hyperoxia-induced ARDS and obesity. A contribution of systemically and naturally increased HO-1 expression in tolerant rats is suggested but needs more study.

Surgery IV
Concurrent Session
8:00 AM
Saturday, January 30, 2016

430 DOES PREOPERATIVE VITAMIN D DEFICIENCY PREDICT POSTOPERATIVE HYPOCALCEMIA AFTER THYROIDECTOMY?

E Alkhalili, MD Ehrhart, MR Burge. *UNM HSC, Albuquerque, NM*

10.1136/jim-d-15-00013.430

Purpose of Study Hypocalcemia is a frequent occurrence after total thyroidectomy. The role of preoperative vitamin D levels in the pathogenesis of this condition is not known. We hypothesized that patients with preoperative vitamin D deficiency would be more likely to suffer from postoperative hypocalcemia, thereby requiring prolonged hospitalization.

Methods Used A retrospective chart review of all patients undergoing total thyroidectomy at the University of New Mexico Hospital between 2005 and 2014 was performed. Patients who underwent parathyroidectomy in addition to thyroidectomy were excluded. The study included 30 patients who had a 25(OH) Vitamin D level obtained within 12 months before surgery. 12 patients with vitamin D deficiency (VDD; 25 [OH] Vitamin D $\leq$20 pg/ml) were compared to 18 patients without vitamin D deficiency (Non-VDD; 25 [OH] Vitamin D > 20 pg/ml). Postoperative levels of calcium, phosphorus, albumin, parathyroid hormone (PTH), and the use of intravenous calcium to treat hypocalcemia, as well as the length of stay and the need for calcium or calcitriol supplementation after discharge, were also compared.

Summary of Results The mean nadir postoperative ionized calcium concentration was lower in the VDD group (0.99 $\pm$0.10 vs. 1.06$\pm$0.06 mmol/L, p=0.04) (Ref Range=1.15–1.27 mmol/l), as was the postoperative concentration of phosphorus (3.48$\pm$0.60 vs. 4.17$\pm$0.84 mg/dL, p=0.03). VDD patients had a longer length of stay when compared to the non-VDD patients (4.3$\pm$4.4 vs. 1.7$\pm$1.5 days, p=0.03). Three patients in the VDD group required intravenous calcium for treatment of symptomatic hypocalcemia, but none of the Non-VDD patients did (p=0.054). There was no difference in the performance of neck dissection or parathyroid auto-transplantation between the two groups.

Conclusions Preoperative vitamin D deficiency is associated with an increased risk of postoperative hypocalcemia and a prolonged length of stay in patients undergoing total thyroidectomy. Vitamin D replacement before thyroidectomy may improve postsurgical outcomes.

431 UTILITY OF A PORCINE MODEL OF POLYMETHYL METHACRYLATE SPREAD DURING KYPHOPLASTY OR VERTEBROPLASTY

J Frankl,[1] M Sakata,[1] A Peterson,[2] C Hennemeyer[2]. *[1]University of Arizona College of Medicine, Tucson, AZ; [2]University of Arizona College of Medicine, Tucson, AZ*

10.1136/jim-d-15-00013.431

Purpose of Study To evaluate the utility of an *ex vivo* porcine model of polymethyl methalcrylate (PMMA) spread within vertebral bodies during kyphoplasty or vertebroplasty.

Methods Used Lumbar and lower thoracic vertebrae were harvested from 6.4–6 month old Yorkshire-Hampshire pigs weighing 45–70 kg that had been sacrificed by intravenous injection of pentobarbital and phenytoin sodium. The skin, superficial fat, and erector spinae muscles were removed to gain access to the spine. The spinal column was split at the junction of L6 with the sacrum and T12 with T11 with an oscillatory autopsy saw. The spine was removed and cleaned, yielding 9 usable vertebrae. Using a C-arm, 10-gauge cannulas were placed in vertebrae with an extrapedicular approach. A kyphoplasty balloon was used to create a cavity in initial trials and an osteotome in subsequent trials. After all cannulas were placed and cavities created, benzoyl peroxide initiator was added to PMMA and methalcrylate powder to initiate the polymerization reaction. PMMA was injected after 2 minutes of polymerization through the cannulas into successive vertebral levels.

Summary of Results The kyphoplasty balloon created a minimal cavity even when filled to 450 pounds per square inch. PMMA injection resulted in significant retropulsion along the cannulas' tracks and minimal spread within vertebral bodies. Spread was reduced further with additional time from the beginning of PMMA polymerization. Cavity creation with the osteotome was also minimal. Deployment of the osteotome resulted in rotation of the device rather than clearing of bone. PMMA spread was similarly minimal after osteotome and kyphoplasty balloon cavity creation.

Conclusions Commonly used cavity creation devices are unable to sufficiently clear trabecular bone within healthy porcine vertebral bodies to inject PMMA with minimal extravasation. PMMA encounters too much resistance in healthy porcine trabecular bone to adequately spread. Vertebrae from young healthy pigs are a poor model of PMMA spread within pathologic or fragility fractures. However, this model indicates that kyphoplasty and vertebroplasty may have a limited role in the treatment traumatic fractures in young healthy humans.

432 ASSESSMENT AND COMPARISON OF VACCINATION STATUS IN PEDIATRIC COCHLEAR IMPLANT PATIENTS: A 10 YEAR RETROSPECTIVE REVIEW

C Jin,[2] P Téllez,[1] D Lu,[2] J Pauwels,[1] S Dobson,[1,2] FK Kozak[1,2]. *[1]BC Children's Hospital, Vancouver, BC, Canada; [2]University of British Columbia, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.432

Purpose of Study A review of vaccination records of pediatric cochlear implant (CI) recipients at BC Children's Hospital implanted between 2002–2007 revealed that 67% of patients were not up-to-date at the time of their surgery, putting them at risk of infections. In 2008, an Infectious Disease Specialist began working with the Cochlear Implant Team in order to address this serious health concern. The objectives of this current study were to

review the vaccination status of CI patients implanted since 2008, compare these findings to those from the aforementioned review and investigate if barriers to child vaccination compliance post-surgery continue to exist.

Methods Used This study consisted of a retrospective chart review and a telephone survey. Medical charts of 116 patients were reviewed. Telephone surveys were administered to the parents of patients who required additional vaccines after their CI (n=28) to obtain current patient vaccination status and, if applicable, reasons for non-compliance.

Summary of Results In 2010–2014, 91% of patients were up to date at the time of surgery, whereas 67% of patients were up to date at the time of surgery in 2002–2007 (a 36% increase). 19 patients have completed the survey thus far and 47% of these patients did not receive the necessary vaccinations post-surgery. Pneumovax-23, a vaccine specifically for high-risk patients, was the only vaccine missed in all 9 cases. The main reason for non-compliance was because parents were unaware that their children should follow the high-risk vaccination schedule.

Conclusions Pre-operative vaccinations improved after administrative changes were made in 2008, however 9% of pediatric CI recipients were still not appropriately vaccinated at the time of surgery. More alarmingly, a large proportion of patients requiring vaccinations after surgery did not receive them. A communication gap continues to exist between the CI team, patient's parents and public health, resulting in CI patients missing vaccines critical to their health. Possible solutions to bridge this communication gap include providing families with updated high risk vaccination schedules post-surgery, sending families reminder notifications, and notifying public health of the patient's high risk status.

433 THE "SIMPLE" CHECKLIST: A CRITICAL APPRAISAL TOOL FOR REVIEWING THE MEDICAL LITERATURE AT JOURNAL CLUB AND BEYOND

N Wierks,[1] A Knox,[2] J Arneja[1,3]. *[1]UBC, Vancouver, BC, Canada; [2]UBC, Vancouver, BC, Canada; [3]BC Children's Hospital, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.433

Purpose of Study Journal club is implemented in residency programs across the world to achieve a variety of educational goals. Over the years, journal club has become a platform for residents to develop critical appraisal skills, but it is unclear whether journal club is actually effective in teaching these skills. The purpose of this study was to identify areas for improvement within journal club by analyzing current concepts and practices, especially the methodology used for review of articles at journal club.

Methods Used An online survey was administered to Canadian and American plastic surgery program directors and residents, as well as editors from prominent plastic surgery journals. The survey was designed to determine current structure of journal club, the goals deemed important, its educational value, the perceived benefits and the article review methodology.

Summary of Results Survey response rates for invited residents, program directors, and journal editors were 33% (30/90), 23%(16/69), and 22% (21/96), respectively. Keeping abreast with current literature and teaching critical appraisal skills were the two main goals of journal club identified by residents (33.3% and 23.3%, respectively) and program directors (31.2% and 43.8%, respectively). Many residents reported that they had only some experience, or were not experienced with critical appraisal of the literature upon entry into residency (46.2%). It was reported by 70.8% of residents that they felt there was no formal instruction of how to critically appraise literature in their residency programs. The majority of residents (75.0%) and journal editors (73.3%) indicated that there was no critical appraisal tool to aid them in their assessment of the articles chosen for discussion. Of respondents who had a tool provided, 87.8% found the tool useful for appraising articles, while 84.7% of those not provided with an appraisal tool thought that it would be useful.

Conclusions In its current form, journal club is not felt to properly address teaching critical appraisal skills to residents. We propose a simple tool to promote succinct, structured critical appraisal and to facilitate efficient preparation and discussion of the literature during journal club.

434 TIMELY EMERGENCY AND URGENT SURGERY ACCESS FOR ACUTELY ILL PEDIATRIC PATIENTS: A RETROSPECTIVE REVIEW

S Kim, S Butteworth. *BC Children's Hospital, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.434

Purpose of Study Emerging literature shows that delays to operation increase patient morbidity and mortality. A preliminary audit at BCCH, a tertiary pediatric hospital, identified that the majority of emergent operations in the most unstable patients (requiring emergent surgery <1 hour) are least likely to have their operation within target. Our study aim was to evaluate the relationship of surgical specialty and patient characteristics on performance of Class 1 cases (<1 hour) within target operating times.

Methods Used With REB approval, a retrospective review of a prospective Operating Room database was performed from January 2011–June 2015. Operative data and patient data were collected and descriptive statistics used.

Summary of Results There were 388 Class 1 cases (5.86% of the total number of emergency cases). The majority of Class 1 cases were performed by the Neurosurgery and General Surgery [169 (44%) of total]. Majority of patients undergoing Class 1 surgeries were 1 year of age or younger (34%). Class 1 cases had a booking time recorded in 39.4%(153 cases): 56% of these Class 1 cases had met a target operating room (OR) time of 1 hour, while 22% of these Class 1 cases had an incision time of 1 hour. Otolaryngology, Urology, and Cardiovascular services were most successful in having 81.0%, 68.1%, and 66.7% of Class 1 cases meeting the target in-room times respectively. Across different services, median time to OR was 55 minutes and median time to incision was 1 hour and 26 minutes. The longest wait time to OR were Ophthalmology cases and in patients aged 0–28 days. Mean anaesthesia time was 30 minutes, with the longest anaesthesia times in Neurosurgery (45 mins) and General

Surgery (40 mins), and in patients aged 0–28 days (44 mins).

Conclusions In our institution, the minority of cases had surgical booking time recorded. For emergent (Class 1) patients, infants and those requiring Neurosurgical and General Surgical intervention were the most likely to experience delays to surgery.

435 IN VIVO ULTRASOUND ELASTICITY IMAGING CLASSIFIES HEALTHY AND DISEASED POSTERIOR TIBIAL TENDONS

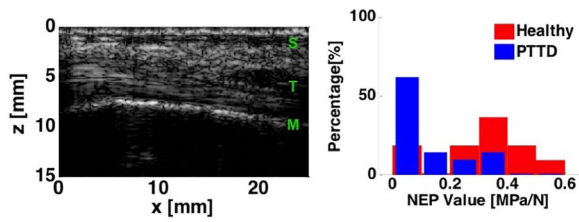
J Klewer, L Gao, J Guerra, J Szivek, M Taljanovic, L Latt, R Witte. *University of Arizona, Tucson, AZ*

10.1136/jim-d-15-00013.435

Purpose of Study Posterior tibial tendon dysfunction (PTTD) is a common tendinopathy that can lead to a decrease in walking ability. Currently, there is no way to determine which patients will do well with conservative care and which will require surgery. Ultrasound elasticity imaging (UEI) is a non-invasive technique that combines US imaging, tendon deformation and force sensing to quantify stiffness of soft tissue. The goal of this study is to determine whether UEI can detect differences in the mechanical properties of the PTT for healthy volunteers and PTTD patients.

Methods Used Eight healthy volunteers and 9 patients with PTTD were recruited for testing. The foot was secured in a custom inversion board in maximum plantar flexion. US data along the PTT were collected while subjects exerted maximal inversion force (F) against a dynamometer. Speckle tracking was then performed to estimate lateral displacement and strain (S_x). US was also used to estimate cross-sectional area (A) of the PTT. The elastic modulus (λ) was calculated as the ratio $(F/A)/S_x$ and plotted against the inversion force. The slope of λ vs. F, referred to as the non-linear elastic parameter (NEP).**Summary of Results** The stress-strain curves differed markedly between healthy and diseased tendons. The diseased tendons demonstrated highly nonlinear behavior. The average NEP values were found to be significantly different ($p<0.01$) between healthy (0.12 ± 0.11 MPa/N) and diseased (0.34 ± 0.19 MPa/N) tendons (Fig 1, right).

Conclusions This project demonstrated that UEI is capable of classifying diseased and healthy tendons based on their non-linear elastic behavior. UEI may eventually be able to predict which tendons can be treated conservatively and which will require surgery. This would improve patient care by preventing unnecessary surgeries in some patients, while avoiding prolonged, unsuccessful rehabilitation in others.



Abstract 435 Figure 1

436 THE ROLE OF ALDOSE REDUCTASE IN THE DEVELOPMENT OF POSTERIOR CAPSULAR OPACIFICATION IN A MOUSE MODEL OF CATARACT SURGERY

L Zukin,[2] M Pedler,[1] JM Petrash[1]. [1]*University of Colorado School of Medicine, Greenwood Village, CO;* [2]*University of Colorado Denver, Aurora, CO*

10.1136/jim-d-15-00013.436

Purpose of Study Cataract surgery to remove the cloudy lens constitutes one of the most common surgeries on the planet. About one-fifth of these patients will develop a secondary, postoperative deterioration of vision called posterior capsular opacification (PCO), whereby residual cells in the lens capsule proliferate in an undesired wound healing process to obstruct the visual axis. While inhibition of aldose reductase has been shown to suppress various biomarkers of PCO in tissue culture cells, our study is designed to investigate the prevention of PCO in a mouse model.

Methods Used A modified extracapsular lens extraction was performed on three different strains of mice: wild-type, aldose reductase overexpression, aldose reductase knockout. RNA expression levels of various epithelial-to-mesenchymal transition (EMT) markers and lens fiber cell regeneration markers were assayed by quantitative polymerase chain reaction (q-PCR). Protein expression of select EMT markers and gross morphological features of the postoperative eye were analyzed by immunofluorescence. Pharmacological aldose reductase inhibition was tested with the drug Sorbinil.

Summary of Results Alterations in expression levels of EMT markers like alpha smooth muscle actin (a-SMA), vimentin, and E-cadherin and lens fiber cell regeneration markers demonstrate a significant role for aldose reductase in PCO. Furthermore, aldose reductase inhibition caused a decrease in representative markers like a-SMA. These results were recapitulated with microscopic examination of the lens capsules with immunostaining.

Conclusions This study demonstrated the role of aldose reductase in the development of PCO in vivo and presents a promising avenue for further research into the prevention of PCO through aldose reductase inhibition.

437 TISSUE EXPANSION IN PEDIATRIC PATIENTS: A 10-YEAR REVIEW

L Bjornson,[1,2] M Bucevska,[2] C Verchere[2,3]. [1]*Queen's University, Kingston, ON, Canada;* [2]*University of British Columbia, Vancouver, BC, Canada;* [3]*BC Children's Hospital, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.437

Purpose of Study Tissue expansion provides large, highly vascularized reconstructive flaps which match the surrounding tissue in colour, texture, thickness, and hair-bearing characteristics. Pediatric tissue expansion is not risk-free,

with complication rates of up to 40%. Few studies have been published in recent years assessing pediatric tissue expansion in Canada. This study aims to review one Canadian pediatric plastic surgeon's experience with tissue expansion in the past 10 years. The objectives were to: (1) examine tissue expander complications among the study cohort, (2) examine flap complications in the same cohort and how they relate to expander complications, and (3) increase understanding of the tissue expansion experience in Canada.

Methods Used The study was a retrospective analysis of the health records of all pediatric patients who underwent tissue expansion by the senior author between January, 2005 and December, 2014 at British Columbia Children's Hospital in Vancouver, Canada. The medical charts and operative reports of eligible patients were reviewed and data were collected on patient demographics, tissue expansion treatment-specific details, complications and outcomes. Data were analyzed using descriptive statistics. Chi-squared test was used to examine the relationship between expander and flap complications.

Summary of Results Ninety-three expanders were placed in and removed from 24 patients during 49 tissue expansion sessions. Complications occurred in 19 of 93 expanders (10 of 24 patients; 16 of 49 sessions), resulting in premature removal of 9 expanders. Forty-eight sessions were successful, ending with defect reconstruction. One session was unsuccessful, as the single expander became exposed and was removed after a month. Sessions with complications appear to have twice as many flap complications as those with no complications, but this is not statistically significant X^2 (1,N=49)=2.17, p=0.140.

Conclusions Tissue expansion is a successful reconstructive method in Canada that provides aesthetically pleasing results. Patients and physicians should be aware that this procedure requires a large commitment of both time and effort, and that there is a 20% risk that a tissue expander will suffer complications.

Adolescent Medicine and General Pediatrics IV
Concurrent Session
10:15 AM
Saturday, January 30, 2016

438 TESTING THE UTILITY OF STANDARDIZED INTERVIEWS FOR RESIDENCY SELECTION BY DIVIDING THE STANDARDIZED QUESTIONS AMONGST MULTIPLE INTERVIEWERS

SU Das, ME Bar-on. *University of Nevada School of Medicine, Las Vegas, NV*

10.1136/jim-d-15-00013.438

Purpose of Study There have been some questions about the utility of standard interviews for residency selection. It is thought that how well a candidate scores on one standard interview is only somewhat correlated with how well that candidate scores on the next interview. One residency program wanted to test the utility of standardized interviews by dividing the questions amongst multiple interviewers and testing the correlation between the scores given by different interviewers.

Methods Used The residency training interviewed 150 candidates for 13 residency spots. The standardized questions were divided amongst the Chair, Program Director and Associate Program Director and all three interviewed each of the 150 candidates. All three interviewers had different questions addressing different viewpoints. The scores given by each interviewer was on a scale of 0 to 7. Correlation coefficients were calculated between each interviewer.

Summary of Results The correlation coefficients between the three interviewers were 0.387 vs. 0.437, 0.387 vs. 0.528, and 0.437 vs 0.528, all of which were significant. It was calculated whether they were significantly different from each other and they were not found to be significantly different.

Conclusions All 3 interviewers' scores were correlated with each other and fell in the range of "moderate" to "strong" correlation. Since there was no significant difference between the correlation coefficients of the different interviewers, this means that all three interviewers were issuing scores for each candidate that were in line with each other, despite asking different questions. Dividing up standardized questions amongst multiple interviewers without repetition of questions could be a potential way to increase the utility of standardized interviews.

439 SOCIAL MEDIA: AN EFFECTIVE METHOD OF ATTRACTING THE MODERN RESIDENCY APPLICANT

C Casilang, S Mehra. *UCSF Fresno, Fresno, CA*

10.1136/jim-d-15-00013.439

Purpose of Study Social media (Facebook, Twitter, etc.) has become a ubiquitous phenomenon and is a new standard of communication among future physicians who are preparing to integrate into the current workforce. While many studies have explored how residency programs use social media to screen candidates, the impact of a residency program's social networking profile on the trainee's residency selection process has not been well studied. This study aims to evaluate the use of social media as a potential residency program selection tool by candidates pursuing a pediatrics residency.

Methods Used Applicants to the UCSF Fresno Pediatric Residency program completed an anonymous 4-question post-interview survey for the 2014–2015 application cycle (n=94). The survey was voluntary. Data was compiled and analyzed to examine the influences of social media on applicants' residency screening and selection process.

Summary of Results For the 2014–2015 application cycle, out of 78 respondents, 55% accessed the "UCSF Fresno Pediatrics" Facebook page to find out more information about the program; 19% of these respondents specifically sought out information related to social activities in which current residents participate. Out of 42 respondents, 52% found the Facebook page to be most useful during interview preparation and in residency program ranking. When asked about what additional information they would find

most useful, 68% responded with wanting more information about alumni outcomes and current resident narratives.

Conclusions Our results show that social networking has a significant influence on how prospective residents learn about and ultimately choose to rank a residency program. In today's competitive landscape for health care employment, residency programs need to assess and evaluate new avenues for recruiting well-qualified applicants. Enhancing residency program presence on social media provides candidates with the chance to determine fit within the program, especially given the limited interaction with current residents during the application process.

440 STRETCHING EFFECT ON CHANGES IN ACHILLES TENDON CROSS-SECTIONAL AREA IN RUNNERS

C Neves,[1] A Johnson,[2] I Hunter[2]. *[1]University of Washington School of Medicine, Seattle, WA; [2]Brigham Young University, Provo, UT*

10.1136/jim-d-15-00013.440

Purpose of Study There is controversy regarding stretching among runners. Many runners stretch either before or after running believing it will improve performance and/or decrease injury rates, while others do not stretch at all believing no benefits come from stretching. The Achilles tendon is a common site of pathology in runners. Achilles tendon thickness/length response to exercise and stretching is an important consideration for runners. This study investigated the acute change in Achilles tendon cross-sectional area (CSA) in response to a three-week calf-stretching program.

Methods Used Thirty-three young runners (16 female, 17 male, age=25.1±3.3 y, height=173.9±10.8 cm, weight=66.4±11.2 kg) completed two running trials (pre-test and post-test) during the study. Participants ran for twenty minutes on a treadmill at 7 mph (3.13 m/s) at 0% or level incline. Achilles tendon cross-sectional area was imaged using Doppler ultrasound. Ankle range of motion was also taken. Participants were randomly assigned to control or intervention groups. The intervention group completed a daily stretching protocol that included three repetitions of 30 seconds of Soleus stretching and three repetitions of 30 seconds of Gastrocnemius stretching on each leg.

Summary of Results Results show there was a significant decrease in Achilles tendon CSA between pre-run and post-run at the baseline measurement and between pre-run and post-run at post treatment for both control and stretching groups ($p<0.001$). There was no difference between groups at baseline or post treatment ($p=0.446$).

Conclusions The results suggest that the Achilles tendon is affected by running with a decrease in CSA. The stretching protocol did not change the rate of Achilles tendon thinning due to running between the control and stretching groups.

441 withdrew

442 PEDIATRIC EXPOSURES TO DISHWASHER AND LAUNDRY DETERGENTS: 2013-2014

M Davis,[2,1] M Casavant,[3,4] H Spiller,[3,4] T Chounthirath,[2] G Smith[2,4,5]. *[1]University of Washington School of Medicine, Seattle, WA; [2]Nationwide Children's Hospital, Columbus, OH; [3]Central Ohio Poison Center, Columbus, OH; [4]The Ohio State University College of Medicine, Columbus, OH; [5]Child Injury Prevention Alliance, Columbus, OH*

10.1136/jim-d-15-00013.442

Purpose of Study The purpose of this study is to analyze the demographic and nationwide trends associated with pediatric exposures to non-pods and pods for dishwasher and laundry detergents in the United States. Previous studies have determined that pediatric laundry detergent pod exposures resulted in serious clinical outcomes and death; however, no study has been conducted to compare non-pod and pod dishwasher and laundry detergent exposures.

Methods Used This investigation was conducted with data from the National Poison Data System to determine exposures to dishwasher and laundry detergents among children younger than 6 years old in 2013 and 2014.

Summary of Results There were 62,254 children younger than 6 years old exposed to dishwasher or laundry detergents in 2013 and 2014. The number and rate of detergent exposures increased by 14.3% and 14.8% from 2013 to 2014, respectively. The highest increase was among laundry pod (17.0% and 17.5%) and dishwasher pod (14.0% and 14.5%) exposures. Eighty-five percent of the children were exposed through ingestion. The odds (OR: 4.8; 95% CI: 4.0–5.8) of hospitalization and (OR: 8.4; 95% CI: 3.9–18.2) serious medical outcomes were significantly higher for laundry detergent pod exposures compared to laundry detergent non-pod exposures; the odds were even greater when compared to either forms of dishwasher detergent exposures. There were 117 children who required intubation (104 children exposed to laundry detergent pods). There were two deaths of children due to laundry detergent pod exposures.

Conclusions Dishwasher and laundry detergents pose a risk to young children, but laundry detergent pods pose the most serious poisoning risk. This nationwide study accentuates the need for methods to prevent exposures to young children. These efforts include changes in product packaging and labeling, changes in product composition and appearance, and public education.

443 A WELL ORGANIZED SYSTEMATIC APPROACH TO INCREASE RESIDENT SCHOLARSHIP

SU Das, ME Bar-on. *University of Nevada School of Medicine, Las Vegas, NV*

10.1136/jim-d-15-00013.443

Purpose of Study To describe the methods one training program implemented to increase resident scholarship and engage faculty to support these activities.

Methods Used The residency program leadership took several measures to increase the scholarly activity. Step one was the creation and implementation of a new scholarly activity policy in 2014. This policy requires all residents to

participate in both scholarly and quality improvement projects during their training. To stimulate resident interest and provide a starting point a list of faculty projects/interests is distributed annually. Step two was the creation of a weekly half-session of availability with the Vice Chair of Research for residents to seek guidance on their projects. All projects required review by the vice chair and supervision by a member of the faculty. "Writing mentors" were identified to help residents with developing their work for presentation and/or publication. Step three included redesigning the "Educator Rotation" in the PGY1 year to focus on the concepts of research methodologies and quality improvement project design. Support for statistical/data analysis is provided from the Office of Medical Research. The program leadership critically assessed each rotation and carved out protected time during specific rotations. The status of scholarly activity for each resident is tracked by the Program Director. To demonstrate the department's commitment to this initiative limited funds have been set aside for residents to travel to present their work at departmentally approved meetings.

Summary of Results The first academic year (2014–15) after the policy was implemented residents had 12 publications and 17 abstracts competitively accepted for presentation. As the 2015–16 academic year starts, there have been 3 publications and 11 abstracts and/or publications in process. A secondary measure has been the increase on the ACGME resident survey response to the question regarding "Satisfaction with opportunities for scholarly activities" from below to above national mean for the academic year 2014–15.

Conclusions Resident participation in scholarly activities can be a reality. A well organized, systematic approach is needed to not only engage residents in the process but also the faculty. The process needs continual nurturing to maintain productivity and satisfaction.

Health Care Research III
Concurrent Session
10:15 AM
Saturday, January 30, 2016

444 IMPROVING ASTHMA CARE IN A PEDIATRIC TEACHING CLINIC

J Lee, A Gogo, D Tancredi, U Shaikh. *UC Davis Medical Center, Sacramento, CA*

10.1136/jim-d-15-00013.444

Purpose of Study Standardized systematic approaches to asthma management result in increased compliance with asthma care guidelines, creation of asthma action plans, appropriate prescription for controller medication, and decreased medical service utilization. There is significant variation in asthma management in the outpatient setting. Our objective was to increase appropriate care for asthma in our pediatric teaching clinic.

Methods Used Our interventions included education of residents and staff and electronic health record(EHR) enhancements. We created a visual aid with key national guideline messages and EHR enhancements such as standardized templates for documentation and management. A chart review was conducted at baseline and repeated every two months through use of Education in Quality Improvement for Pediatric Practice(EQIPP), a quality

Abstract 444 Table 1 Responses on EQIPP questionnaire

Questions in Asthma EQIPP module and their favorable responses per chart review	Baseline Chart Review October 2014	Cycle 1 Chart Review January 2015	Cycle 2 Chart Review March 2015	Cycle 3 Chart Review May 2015	Cycle 4 Chart Review July 2015
Were one or more asthma key indicators present when considering the diagnosis of asthma?	38 out of 65 (58%)	76 out of 89 (85%)	30 out of 32 (94%)	27 out of 33 (82%)	32 out of 38 (84%)
Was a standardized instrument used to determine the current level of asthma control?	13 out of 65 (20%)	30 out of 89 (34%)	15 out of 32 (47%)	14 out of 33 (42%)	22 out of 38 (58%)
Is spirometry currently scheduled to be tested or have results been obtained within the last 1 or 2 years? (for those greater than 5 years old)	10 out of 61 (16%)	30 out of 77 (39%)	4 out of 20 (20%)	9 out of 28 (32%)	12 out of 32 (38%)
Was the age appropriate national asthma guideline stepwise table used to identify treatment options or to adjust therapy based on asthma control?	18 out of 65 (28%)	45 out of 89 (51%)	31 out of 32 (97%)	20 out of 33 (61%)	30 out of 38 (79%)
Has a flu shot been administered or recommendation made within the past 12 months? (for those greater than 6 months old)	36 out of 64 (56%)	81 out of 89 (91%)	31 out of 32 (97%)	27 out of 33 (82%)	26 out of 38 (68%)
Does the patient have a written asthma action plan?	19 out of 65 (29%)	41 out of 89 (46%)	17 out of 32 (53%)	19 out of 33 (58%)	24 out of 38 (63%)
Were asthma self-management education and materials provided and explained to the patient and family at any visit?	23 out of 65 (35%)	53 out of 89 (60%)	21 out of 32 (66%)	23 out of 33 (70%)	28 out of 38 (74%)

improvement module created by the American Academy of Pediatrics. After each chart review, residents were given feedback on group and individual results. Pairwise between-timepoint comparisons(using baseline as the reference group) of process of care outcomes were analyzed in SAS using logistic regression, with Dunnett-Hsu confidence intervals to adjust for multiple comparisons.

Summary of Results Several measures showed statistically significant improvements in use of standardized instruments to determine level of control, use of national guidelines for treatment, providing asthma action plans and education. We noted statistically significant improvement in influenza immunization in months when patients face the highest risks for influenza.

Conclusions Our university-based teaching clinic serves a large proportion of underserved children who are at highest risk for complications related to asthma. Standardization and the use of EHR improved adherence to national guidelines for pediatric asthma management. Utilizing the asthma EQIPP module allowed us to monitor measures over the course of our intervention.

445 USABILITY TESTING OF THE BURN SURVIVAL KIT WITH HEALTHCARE PROVIDERS IN UGANDA

A Ribeiro,[4] A Maccan,[4] A Rajwani,[4] J Huebner,[1] M Caulfield,[4] MM Ajiko,[3] N O'Hara,[1] R Evans[2]. *[1]BC Children's Hospital, Vancouver, BC, Canada; [2]University of British Columbia, Vancouver, BC, Canada; [3]Soroti Regional Referral Hospital, Soroti, Uganda; [4]University of British Columbia, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.445

Purpose of Study It is estimated that over 300,000 people die from burn injuries annually, and approximately 90–95% of burn-related deaths occur in low- and middle-income countries. Although many high-income countries have made significant advancements in burn treatments, resource constraints have prevented similar burn patient outcomes in low- and middle-income countries. This study assessed the usability of the Burn Survival Kit (BSK) amongst healthcare workers (HCW) as an accessible algorithm for primary care of burns in Uganda. The BSK consists of rehydration salts, novel wound dressing and a step-by-step wordless illustrative instructions intended to overcome language barriers in multilingual settings.

Methods Used The study recruited HCW frome 14 healthcare facilities in Eastern Uganda. The HCW performed a filmed simulation of burn treatment using the BSK on a mock-burn without prior instruction on BSK use. Written debriefing questions and a short categorical questionnaire were then administered.

Summary of Results Of the 20 HCW that participated in this study, 65% were female and the mean age was 34.6 years (SD: 10.6). Subjects most commonly identified as a nurse (35%), with either a certificate or diploma, and all of the subjects reported attending to patients. None of the HCW used the kit as intended from start to finish, and 25% applied the rehydration salts to the wounded area. 95% agreed or strongly agreed they would "like to use the BSK in the treatment of burns" and 65% either agreed or strongly agreed that the BSK was easy to use.

Conclusions The overall attitude of Ugandan HCW toward the BSK was positive, however, necessary improvements were identified. Possible improvements include numbering the compartments to ensure treatment sequence and the use of English in the instructions. These results will help guide the initial treatment of burns in low-income countries such as Uganda.

446 OCCUPATION-RELATED DIFFERENCES IN HEMOGLOBIN A1C IN A PREDOMINANTLY HISPANIC POPULATION

A Manshad, JR Bucheli, MR Burge. *UNM HSC, Albuquerque, NM*

10.1136/jim-d-15-00013.446

Purpose of Study Occupation may be a surrogate for socioeconomic status. To better describe the distribution of A1c levels among a New Mexico working population enriched in Hispanic individuals and known to be at risk for type 2 diabetes (T2D), we investigated the relationship between different occupational classes and their effects on A1c levels. We hypothesized that lower occupational class was associated with higher levels of A1c after adjusting for important covariates.

Methods Used We determined the glucose homeostasis status of 219 adults from New Mexico who were at risk for diabetes using A1c criteria. All subjects completed a comprehensive health survey and were categorized into five groups according to their occupational class: (1) Homemaker; (2) Homemaker and Part-time Worker; (3) Full-time Worker; (4) Student; and (5) Unknown. Glucose homeostasis status was assigned as: no diabetes (A1c<5.7%), prediabetes (A1c 5.7–6.4%), and T2D (A1c >6.4%). Of the entire group, 48% had no diabetes, 50% had prediabetes, and 2% had T2D.

Summary of Results 179 patients with complete data sets were included in the analysis. We assessed the differences in A1c values across occupational categories with an Analysis of Covariance and estimated the Means (with 95% CIs) for each occupational category using a multivariate linear combination. Mean age was 45±2 years, the group was predominantly female (66% F), and the ethnic

Abstract 446 Table 1

n=179	Homemaker (n=19)	Homemaker & Part-time Worker (n=13)	Full-time Worker (n=94)	Student (n=34)	Unknown (n=19)	p-value
Model 1	5.27 (4.34–6.09)	5.20 (4.36–6.04)	5.04 (4.24–5.84)	4.76 (3.93–5.59)	5.09 (4.26–5.92)	0.006
Model 2	5.25 (4.35–6.15)	5.22 (4.29–6.15)	5.04 (4.14–5.94)	4.77 (3.83–5.73)	5.10 (4.17–6.01)	0.021

composition was 45% Hispanic, 39% NHW, 10% Native American, 3% African American and 3% other. As shown in the Data Table, homemakers, and part-time workers had the highest levels of A1c after adjusting for age, sex, weight, ethnicity, parental history of diabetes, history of hypertension, and smoking status (Model 1). This association remained consistent after additionally adjusting for education (Model 2).

Conclusions In this cohort of New Mexico residents, low occupational class is positively associated with higher levels of A1c independent of conventional risk factors.

447 A METHOD FOR MULTISTAGE SAMPLING IN THE RANDOMIZATION OF HOUSEHOLD SURVEYS IN DEVELOPING COUNTRIES

MD Caulfield,[1] A Rajwani,[1] AS Maccan,[1] J Huebner,[2] A Ribeiro,[1] MM Ajiko,[3] N O'Hara,[4] R Evans[5]. *[1]University of British Columbia, Vancouver, BC, Canada; [2]University of Southern California, California, CA; [3]Soroti Regional Referral Hospital, Soroti, Uganda; [4]BC Children's Hospital, Vancouver, BC, Canada; [5]University of British Columbia, Vancouver, BC, Canada*

10.1136/jim-d-15-00013.447

Purpose of Study Obtaining a properly randomized sample while conducting a household survey is crucial to the generalizability of the results, but can be especially difficult in developing countries where maps, home phones, addresses, and street names are either not available or insufficient. The purpose of this study is to explore the potential of computer technology to standardize randomization, provide a means of in-field navigation and allow for mechanisms of quality control.

Methods Used Twenty Parishes in Uganda were selected from the Land Conflict Mapping Tool using a random number generator. A web interface was then constructed to digitize the coordinates of individual houses and generate roads on satellite imagery. A random subset of houses to be sampled were generated using ArcGIS software and GeoPDF maps were created. The maps were loaded into Avenza PDF Maps on mobile devices which enabled real time navigation in the field for locating the houses. The mobile devices were also used to collect survey data.

Summary of Results The methods described in this paper were used to estimate the 5 year incidence of burns in the Northern and Eastern regions of Uganda. The process of clicking putative houses on the satellite imagery and manually laying down roads was the most time-consuming aspect of the set-up, but can be worked on remotely or in the field by multiple individuals at the same time.

Conclusions Carrying out this process in the field is user-friendly and can be easily accomplished by novices or volunteers. The techniques described not only encourage household surveys by aiding navigation, but also improves the quality of the findings by making the samples more representative. Information gathering of this sort is especially valuable in developing countries where administrations often lack basic demographic data on their citizens and effective developmental policies are desperately needed.

448 UNDERREPRESENTED MINORITY (URM) MEDICAL STUDENT PERSPECTIVES ON RETENTION AND ADVANCEMENT

AJ Smith, C Solomon, LS Morales. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-d-15-00013.448

Purpose of Study Underrepresented minority (URM) medical students have lower retention rates compared with majority medical students. Research identifying effective support or evidence-based interventions for the retention and advancement of URM students is limited. The purpose of this study is to investigate URM medical student perspectives on retention and advancement.

Methods Used A survey was conducted to garner the perspectives of URM medical school graduates between 2011 and 2015. Participants (N=50) were recruited by email through known URM student networks and referrals. The web-based survey consisted of 4 sections including demographic and social characteristics, medical school characteristics, facilitators of success, and self-assessed success in medical school. Facilitators were divided into 6 subcategories including mentorship, academic support, financial support, peer support, mental health counseling and career counseling. Participants rated the importance of each facilitator on an ordinal scale of 0–5, with 0 being "not at all important" and 5 being "extremely important".

Summary of Results Participants rated faculty mentoring (mean 4.52, SD 1.03) and financial support (mean 4.50 SD 0.84) as the most important factors to retention of URM students in medical school. When asked about desired mentor characteristics, participants rated having a mentor with the same career interest as them highest (mean 3.84, SD 1.09) followed by someone who was of the same race/ethnicity as them (mean 3.24, SD 1.42). Peer support was also ranked highly as a perceived facilitator of retention and success (mean 4.18, SD 1.03). Members of ethnic-affinity student groups indicated that membership had the most positive effect on their psychosocial well-being (mean 4.28, SD 1.21, n=36). Members also indicated positive effects on their professional development (mean 4.00, SD 1.31, n=36) and academic performance (mean 3.61, SD 1.32, n=36).

Conclusions Participants reported that mentorship, financial support, and peer support were the most important facilitators associated with retention and success in medical school. Race/ethnicity concordance between the student and their faculty mentors was also highly valued by survey participants.

449 PRIMARY CARE PROVIDERS' PERCEPTIONS OF DIABETES PREVENTION PROGRAMS

EC Vasti,[1] S Tsoi,[2,1] T Moin[3,1,2]. *[1]VA Greater Los Angeles Healthcare System, Los Angeles, CA; [2]David Geffen School of Medicine at UCLA, Los Angeles, CA; [3]HSR&D Center for the Study of Healthcare Innovation, Implementation & Policy, Los Angeles, CA*

10.1136/jim-d-15-00013.449

Purpose of Study The increasing burden of diabetes has shifted the spotlight to prediabetes and the importance of

diabetes prevention, especially in a primary care setting. There is strong evidence to support the use of Diabetes Prevention Programs (DPPs), however, few studies have evaluated primary care provider's (PCPs) perceptions' of DPP modalities. Our objectives were to: (1) evaluate PCPs' knowledge and perception of prediabetes, as a stand-alone diagnosis; (2) assess PCPs' awareness of their patients' barriers and facilitators to seeking DPPs; (3) and evaluate PCPs' perceptions of various DPP modalities in the outpatient care setting.

Methods Used We interviewed 16 PCPs from four outpatient VA Greater Los Angeles clinics using a semi-structured questionnaire. Interviews were transcribed and qualitatively analyzed using CFIR and RE-AIM constructs.

Summary of Results We identified 2 main overlying themes; (1) Prediabetes, as a stand-alone diagnosis, and the evidence to support DPP interventions are not consistently, nor fully, acknowledged by PCPs. For instance, PCPs defined "optimal care" for prediabetes as modifying patient risk factors through sustainable lifestyle changes. However, we found a general lack of knowledge about DPPs, both in-person and online. (2) Most PCPs are referring patients to lifestyle modification programs, but they perceived many barriers for most of their patients. PCPs believed that these barriers, such as factors of convenience and patient motivation, were partially addressed through a wider menu of options, including online and individualized counseling.

Conclusions The invisibility of prediabetes is evident on multiple individual (patient and provider) and organizational levels, and this has many implications on the management and prevention of this disease. This study highlights a potential misalignment between the goals of promoting group-based lifestyle interventions within the VA and PCPs' perceptions of very low levels of uptake and effectiveness. Alternative delivery models, such as online DPP interventions, may help reduce some of the perceived barriers, and may be worth additional study.

Hematology and Oncology III
Concurrent Session
10:15 AM
Saturday, January 30, 2016

450 CHARACTERIZATION OF A CUSTOM MONOCLONAL ANTIBODY AS A NOVEL TUMOR BIOMARKER IN HUMAN GASTROINTESTINAL CANCERS

JS Ryan,[1] Q Wang,[2] D Wu,[1,2] Z Dong,[1,2] P Wu[1,2]. [1]*University of Washington School of Medicine, Seattle, WA;* [2]*VA Puget Sound Health Care System, Seattle, WA*

10.1136/jim-d-15-00013.450

Purpose of Study Coxsackie and Adenovirus Receptor (CAR) is a 46-kDa transmembrane protein associated with tight junctions and functionally serves as a receptor for Coxsackie B virus and Adenovirus infections. Recently, CAR expression has been shown to be upregulated in different types of cancer, suggesting that it may serve as a useful solid tumor biomarker. The purpose of this study is to characterize the expression CAR in human gastrointestinal tumors and to test the efficacy of a custom monoclonal antibody (mCAR) compared to a commercial polyclonal source (pCAR). We hypothesize that CAR expression is upregulated in dysplastic and malignant epithelial cells, but not expressed in normal epithelial tissues in GI cancers.

Methods Used CAR expression was tested in vivo using archival human tissue blocks that were obtained from the VHA Puget Sound institutional GI Tumor bio-repository. 20 human rectal tumor specimens and 9 human esophageal tumor specimens were evaluated for mCAR and pCAR staining. Tissue blocks were sectioned and then stained using immunohistochemistry (IHC). The custom mCAR antibody was derived from a sequenced hybridoma line and generated and purified from mouse ascites. In vitro CAR expression was tested using immunofluorescence and 4 immortalized colorectal tumor cell lines. In vivo expression was tested in the human surgical specimens obtained from the bio-repository.

Summary of Results CAR was found to be tumor-specific and stain strongly for malignant epithelial tissues in 78% (7/9) of esophageal specimens, 90% (18/20) of rectal tumors, and 75% (3/4) of tumor cells lines. In 2 patients diagnosed as a pathological complete response following chemoradiation (i.e. no viable tumor), microscopic occult disease was detected upon staining with CAR resulting in tumor upstaging. Both mCAR and pCAR stained strongly for malignant and dysplastic epithelial cells with no detectable staining in normal epithelial cells. Increased sensitivity and specificity was observed using mCAR compared to pCAR.

Conclusions This study provides compelling evidence that CAR antibody may serve as a novel tumor-specific biomarker for human gastrointestinal cancers and increase detection of microscopic occult disease to help guide cancer therapy.

451 LIPOPLEX DELIVERY OF MICRO-RNA 200C TO OVARIAN CANCER CELLS

L Smith,[1] M Gordon,[1] JL Betker,[2] TJ Anchordoquy,[2] JK Richer[1]. [1]*University of Colorado AMC, Denver, CO;* [2]*University of Colorado AMC, Aurora, CO*

10.1136/jim-d-15-00013.451

Purpose of Study Ovarian cancer metastasizes by cell shedding and direct seeding to other sites within the peritoneal cavity. Essential steps in the metastatic cascade include the epithelial to mesenchymal transition (EMT) and resistance to anoikis (detachment-induced cell death). Our lab determined that restoration of miR-200c, a non-coding microRNA, decreased ovarian cancer progression by reversing EMT, increasing anoikis sensitivity and also increasing sensitivity to taxane chemotherapeutics. We hypothesize that delivery of miR-200c via direct intraperitoneal injection can be used as an adjuvant to traditional chemotherapeutics to increase anoikis, decrease metastasis, and lower tumor burden. Lipolexes are synthesized from naturally occurring lipid compounds, and can serve as low toxicity delivery vehicles for miR-200c and have the potential to be used in human therapy. We examined the effects of lipoplex-mediated delivery of miR-200c to ovarian cancer cells.

Methods Used The ovarian cancer cell lines HEY and OV-1847 were treated *in vitro* with 100nM of miR-200c lipoplexes for 48, 72, and 96 hours. We tested four formulations of lipoplex for efficiency of delivery. Gene expression of miR200c and downstream targets were measured by qRT-PCR. Migration/invasion were assessed using an Xcelligence Real-Time Cell Analyzer, and apoptosis/anoikis was measured by Caspase 3/7 assay.
Summary of Results Transfection of ovarian cancer cells with lipoplexes containing miR-200c resulted in approximately a 1,000-fold increase of miR-200c levels ($p<0.0001$) as well as expression changes in downstream targets, including ZEB1 and ESRP1. Changes in expression were most significant at time points greater than 72 hours. The formulations did not show equally potent delivery of miR-200c. Cells treated with miR-200c had decreased ability to migrate and invade compared to negative control cells. Finally, the miR-200c treated cells had increased anoikis as measured by Caspase 3/7 assay.
Conclusions The miR-200c lipolex delivery method is effective at introducing miR-200c at high levels and subsequently altering downstream targets and affecting cancer-related cellular functions. Based on the results of the *in vitro* studies we plan on testing this delivery method *in vivo* in conjunction with taxane chemotherapy.

452 PHYSICIAN-PATIENT DISAGREEMENT ON EASTERN COOPERATIVE ONCOLOGY GROUP PERFORMANCE STATUS IS ASSOCIATED WITH INCREASED MORTALITY IN PATIENTS WITH HEMATOLOGIC MALIGNANCIES

MA Liu,[1] T Hshieh,[2,3] N Condron,[3] M Wadleigh,[3] P Armand,[3] G Abel,[3] JA Driver[2,3,4]. [1]*University of Arizona College of Medicine, Tucson, AZ;* [2]*Harvard Medical School, Brigham and Women's Hospital, Boston, MA;* [3]*Harvard Medical School, Dana-Farber Cancer Institute, Boston, MA;* [4]*Boston VA Medical Center, Boston, MA*

10.1136/jim-d-15-00013.452

Purpose of Study To evaluate physician and patient assessment of ECOG performance status (PS) and whether differences impact survival.
Methods Used We retrospectively analyzed 1,418 patients with hematologic malignancies at Dana-Farber Cancer Institute from 2007–2014 who completed a PS self-assessment at their first visit and also had a baseline physician-assigned PS. We analyzed physician-patient agreement using weighted kappa (κ) statistics. We used Kaplan-Meier plots and Cox proportional hazards models to determine the association between the two PS scores and survival.
Summary of Results The cohort had a mean age of 58.6 years (SD 14.7) and was followed for an average of 38 months. Overall agreement was fair ($\kappa=0.41$). Physicians gave patients a higher functional status (lower PS scores) than patients gave themselves (mean score 0.60 vs 0.81). Both patient and physician PS scores predicted increased mortality. For PS 1 and 2, physician scores clearly differentiated survival groups, while patient scores did not. Stratified by age group, patient scores of PS 1 and 2 identified distinct survival groups in younger patients (> 50) but not in older age groups. Disagreement predicted increased mortality risk whether physicians assigned a higher (HR 1.38, CI 1.13–1.67) or lower (HR 1.55, CI 1.21–1.98) functional status than patients. Among the oldest >70 patients, physician assignment of a lower functional status than the patient meant higher mortality risk. In the youngest <50 patients, shorter survival was only seen when physicians predicted a higher functional status than patients. Shorter survival was observed for disagreement between physicians and patients in either direction in patients with non-aggressive vs. aggressive malignancies.
Conclusions While physician-assigned PS scores appear to be overall better predictors of mortality, physicians and patients frequently disagree on PS measures and this discordance is significantly associated with increased mortality. Aggressiveness of disease and age are important modifiers of discordance.

453 DEVELOPMENT OF OPTIMIZED PROTOCOL FOR GENERATION OF NATURAL KILER CELLS EXPRESSING CHIMERIC ANTIGEN RECEPTORS FROM HEMATOPOIETIC STEM CELLS FOR CANCER IMMUNOTHERAPY

A Patel,[1] L Truscott,[2] SN De Oliveira[3]. [1]*Western University of Health Sciences, Pomona, CA;* [2]*University of California Los Angeles, Los Angeles, CA;* [3]*University of California Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.453

Purpose of Study Natural Killer (NK) cells are innate immune cells that represent a very promising source for cancer immunotherapy. Chimeric antigen receptors (CAR) are engineered fusion proteins that can activate immune cells against specific surface markers. Gene modification of NK cells can direct their specificity and enhance their function, but the efficiency of gene transfer in mature NK cells is limited. The goal is to develop a protocol with maximal generation of CAR-expressing NK cells from stem cells for clinical applications.
Methods Used A lentiviral vector co-delivering CD19-specific CAR and enhanced green fluorescent protein was used for gene modification of primary human peripheral blood stem cells. Gene-modified cells were then co-cultured with OP9-DL1 stromal cells over 35–40 days in different conditions. Medium "A" consisted of a-MEM enriched with 20% of fetal bovine serum and recombinant human cytokines SCF 5ng/mL, Flt3L 5ng/mL, IL-7 5ng/mL, and IL-15 10ng/mL. Medium "B" was AIM V enriched with 10% of human AB serum and cytokines SCF 5ng/mL, Flt3L 5ng/mL, IL-7 20ng/mL, and IL-15 50ng/mL. Medium "C" was similar to medium "B" excluding human serum. After 10 days of culture, IL-2 10ng/mL was added to all three media ("plus") creating six different conditions. Flow cytometry and digital droplet PCR were used for analysis.
Summary of Results NK cell differentiation was achieved in all conditions. Higher concentrations of IL-7 and IL-15 increased the differentiated populations. Total cell yields were 100–220-fold expansions, with highest counts recovered from conditions with higher IL-7 and IL-15. Removal of serum and addition of IL-2 did not seem to affect

differentiation or proliferation. CD56+/CD16+/CD94+ NK cells were present in 10–40% of all CD56+ cells.
Conclusions Large-scale GMP-compatible generation of clinically relevant numbers of gene-modified NK cells from HSC is feasible. Higher doses of cytokines IL-7 and IL-15 successfully increase the yield of NK cells from peripheral blood stem cells. Absence of serum did not decrease differentiation or proliferation.

454 CHARACTERIZING THE IMMUNE MICROENVIRONMENT OF MALIGNANT PERIPHERAL NERVE SHEATH TUMORS IN ORDER TO GUIDE IMMUNOTHERAPY

S Jensen,[1] A Singh,[1] S Dry,[2] B Chmielowski,[2] N Federman,[1] F Eilber,[2] E Shurell[2]. [1]*David Geffen School of Medicine at UCLA, Los Angeles, CA;* [2]*David Geffen School of Medicine at UCLA, Los Angeles, CA*

10.1136/jim-d-15-00013.454

Purpose of Study Malignant Peripheral Nerve Sheath Tumors (MPNST) develop spontaneously or in 5–10% of patients with neurofibromatosis type 1 (NF1). Although surgery is the most effective therapy for MPNST, some patients are poor surgical candidates and/or have relapsed or systemic disease. Due to a poor response to systemic therapy, new therapies are needed for these patients. It is now recognized that in many cancers, the immune state of the tumor microenvironment can be used to predict the tumor's response to specific immune checkpoint blockades. In this study, we characterized the expression of PD-1, PD-L1, and CD8 infiltrates in MPNST, neurofibromas (NF), shwannomas (S) and in normal nerve tissue and correlated these factors with patient outcome.
Methods Used A comprehensive tissue microarray was created from 141 surgical specimens from 86 patients over a period of 27 years (1982–2009): MPNST (n=53), NF (n=57), schwannoma (n=11), and normal nerve (n=20). Of the 53 MPNST samples, 38 were primary tumors, 10 were recurrent tumors and 5 were metastatic. Cores from different blocks were stained for PD-L1, PD-1 and CD8 and scored based on intensity of staining on a scale of 0–3 and percent of cells staining positively. Significance of staining differences between groups was compared via chi squared analysis and survival analysis was performed using a Cox proportional hazards model.
Summary of Results No PD-1 staining was seen. PD-L1 staining of at least 1%: 0/20 nerves(N), 2/68 benign lesions (BL) and 9/53 malignant lesions (ML); at least 5% PD-L1: 2/68 BL and 7/53 ML. CD8 staining of at least 5%: 1/20 N, 45/68 BL and 30/53 ML. PD-L1 was significantly greater in MPNST than both N and BL ($p=0.049$ and $p=0.008$) at 1% but only BL at 5% ($p=0.033$). The presence of PD-L1 or CD8+ didn't influence survival.
Conclusions MPNST and NF have low PD-L1 and no PD-1 expression but contain CD8+ infiltrates. No correlation between survival and PD-L1 and CD8 staining was seen.

455 THE BIOLOGY OF MUCIN-2 (MUC2) IN BREAST CANCER

A Astashchanka, B Jacobsen. *University of Colorado School of Medicine, Aurora, CO*

10.1136/jim-d-15-00013.455

Purpose of Study Resistance to chemotherapy is a major issue in the treatment of breast cancer. Breast tumors that secrete mucus are especially resistant to chemotherapy. One type of secreted mucin, Mucin-2 (MUC2), is not expressed in normal breast cells but is expressed in some breast cancers such as mucinous breast cancers (MBC). While patients with MBC typically have a favorable prognosis, their tumors are resistant to chemotherapy. Little is known about the effects of MUC2 on the biology of breast cancer. This study examined the role of MUC2 in breast cancer cell proliferation, response to chemotherapy, and how MUC2 expression is regulated in breast tumor cells.
Methods Used Two novel model cell lines of mucinous breast cancer were developed from patient derived tumorgrafts called BCK4 and PT12, both of which secrete MUC2. In order to examine the effects of modulating MUC2 levels, MUC2 expression was decreased using shRNA targeted to MUC2 compared to a non-targeting control shRNA. Decreased expression of MUC2 was confirmed using immunoblotting and quantitative immunocytochemistry. Proliferation was measured using the IncuCyte live cell imaging system. Response to chemotherapy was measured by examining apoptosis using cleaved-caspase 3 staining. To examine the regulation of endogenous MUC2 expression, wild-type BCK4 cells were treated with epidermal growth factor (EGF) with or without an EGF-receptor inhibitor or tumor necrosis factor alpha (TNFA) and MUC2 expression was examined using quantitative immunocytochemistry.
Summary of Results BCK4 and PT12 cells both contain MUC2 with cytoplasmic, heterogenous expression. Proliferation was increased in BCK4 cells with decreased MUC2 versus control cells. Docetaxel treatment induced minimal apoptosis in BCK4 control cells, however, it significantly increased apoptosis in BCK4 cells with reduced MUC2. Endogenous MUC2 expression in wild-type BCK4 cells was increased with addition of EGF or TNFA; EGF mediated stimulation of MUC2 was abolished by addition of the EGF-receptor inhibitor, Erlotinib.
Conclusions MUC2 expression plays an important role in mediating cell proliferation and apoptosis in breast cancer cells. Endogenous MUC2 is regulated by EGF and TNFA. These data suggest that MUC2 expression is important in controlling the biology of MBC and MUC2 positive tumors.

Immunology and Rheumatology II
Concurrent Session
10:15 AM
Saturday, January 30, 2016

456 PHENOTYPE OF HUMAN REGULATORY T CELLS EXPRESSING FOXP3 SPLICE VARIANTS

M Maurano,[1] SF Ziegler[2]. [1]*University of Washington SOM, Seattle, WA;* [2]*Benaroya Research Institute, Seattle, WA*

10.1136/jim-d-15-00013.456

Purpose of Study The transcription factor FOXP3 is required for the development and function of the regulatory T cell subset (TReg), which is crucial for maintenance of immune tolerance. Human Treg express both full length (FL) FOXP3 and a delta exon2 splice variant (dEx2). Sequences in exon2 have been shown to bind and inhibit the transcription factor critical for T helper 17 (Th17) differentiation, RORC, suppressing pro-inflammatory IL-17 production. However, studies of the role of the splice variant in disease and T cell function have been inconclusive, possibly because of the complexity of the Foxp3 interactome. Due to the importance of both Th17 cells and TReg in multiple sclerosis (MS), we hypothesized that an excess of dEx2 may contribute to TReg instability and failure of tolerance in MS. The purpose of this study is to determine whether dEx2 expression is elevated in TReg from patients with MS, and to phenotype the dEx2+ TReg population.

Methods Used Peripheral blood mononuclear cells of 20 MS patients untreated at the time of draw and 20 gender and age matched controls were thawed, CD4 enriched, stained with viability dye and extracellular fluorescent antibodies for surface markers, then fixed and permeabilized for intracellular staining of Foxp3, and run on an LSRII flow cytometer. Analysis was performed in FlowJo v10.10, Excel and Graphpad Prism v6.

Summary of Results There was no difference between MS and control samples in the percentage of the CD4 population expressing dEx2, or in the ratio of FOXP3 splice forms. However, the dEx2+ population in all samples exhibited an altered surface phenotype from that of FL+ Treg. dEx2+ TReg expressed higher levels of effector-associated molecules CD126 and CD127, lower levels of inhibitory molecules CD39, CD25, PD-1, and reduced pro-apoptotic CD95.

Conclusions dEx2 was expressed at a similar level and frequency in patients with MS as in healthy controls, and is therefore unlikely to contribute to disease. We have begun to identify a novel surface phenotype, which may offer the chance to sort these cells for functional testing. The nature of the phenotypic alteration suggests a less suppressive subset of TReg, and warrants further investigation into the significance of the splice variant.

457 ANTI-CYCLIC CITRULLINATED PROTEIN ASSAYS AND THE FUTURE DEVELOPMENT OF RHEUMATOID ARTHRITIS

SL Dill,[3] K Deane,[2] ED Jess[1]. [1]*Uniformed Services University, Bethesda, MD;* [2]*University of Colorado, Aurora, CO;* [3]*University of Colorado, Aurora, CO*

10.1136/jim-d-15-00013.457

Purpose of Study A preclinical phase of rheumatoid arthritis (RA) exists where individuals have circulating autoimmunity prior to the onset of clinical arthritis. In particular, antibodies to cyclic citrullinated peptides (CCP) in preclinical RA are highly specific for future RA and could be used to identify individuals for preventive interventions. However, there are several different versions of CCP available (CCP2, CCP3 and CCP3.1) and there is limited comparative data of each of these in predicting future RA. As such, the aim of this study is to compare the performance characteristics of three CCP tests for future RA and in particular to determine the diagnostic accuracy of CCP3 in preclinical RA.

Methods Used Preclinical RA serum from the Department of Defense Serum Repository (DoDSR) comprised of RA cases and matched controls were tested for CCP2 (Axis-Shield), CCP3 (INOVA) and CCP3.1 (INOVA). Analyses were performed in the DoDSR set to determine the sensitivity (SN), specificity (SP), and positive predictive value (PPV) at 1× and 2× the upper limit of normal (ULN) for each assay; additionally evaluated was the diagnostic accuracy of these assays for future RA within 3 or 5 years.

Summary of Results At 1x ULN CCP2 and CCP3 each had a SN for future RA of 67%, and CCP3.1 had an SN of 73%. CCP2 had a SP of 100% at 1 or 2× ULN, compared to 99% for CCP3 and 93% for CCP3.1 at 2× ULN. The PPV for future RA for CCP2 was 55% at 3 years and 74% at 5 years at 1× and 2× ULN. The PPV for CCP3.1 at 3 years was 54% at 1× ULN, at 5 years it was 72% at either 1× or 2× ULN. For CCP3 the PPV was 54% at 3 years at 1x ULN and 53% for 2× ULN, and at 5 years 72% and 71%, respectively.

Conclusions These assays have high diagnostic accuracy for future RA. While there were some differences, CCP3 had similar performance as CCP2 and CCP3.1. In addition, a majority of those with elevated CCP will develop clinical RA within 3–5 years. In aggregate, the findings suggest that these CCP tests could be used to identify individuals with high likelihood of developing RA within 3–5 years. This information is useful in developing prevention studies for RA that could rely on CCP positivity to identify individuals at high-risk for future RA within a defined time period.

458 TRANSCRIPTOME ANALYSIS OF PSORIASIS AND WOUNDED SKIN

SX Chen, K Chun, T Hata, R Gallo. *University of California, San Diego, La Jolla, CA*

10.1136/jim-d-15-00013.458

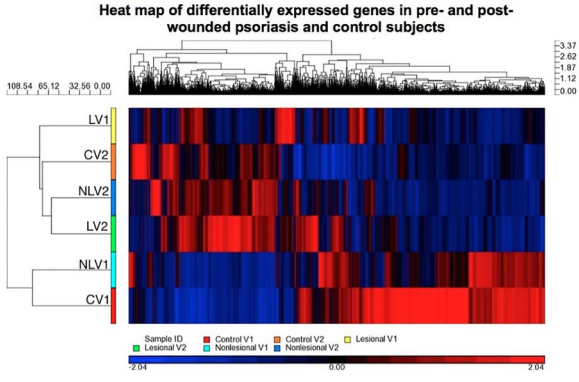
Purpose of Study Using RNA-sequencing, we compared transcriptomes of lesional and non-lesional psoriasis skin with normal skin before and after wounding to identify differentially expressed genes (DEGs) in order to better elucidate the pathogenesis of psoriasis.

Methods Used One psoriasis subject underwent a 4mm punch biopsy to both lesional and nonlesional skin, and one control subject received a 4mm punch biopsy of healthy skin. 4 days later, these subjects received 4 mm post-wounding punch biopsies directly over the initial biopsy sites.

Summary of Results RNA-seq showed enrichment of DEGs involved in inflammation and keratinocyte migration (SERPINB3/B4, IL1B, DSG3) in both lesional psoriatic and wounded normal skin but not nonlesional psoriatic and unwounded normal skin. CD64 and B-defensins were most upregulated in normal wounding, but were also elevated in nonlesional psoriatic skin. Ontological analysis showed that normal, unwounded skin shared a profile most similar with non-lesional psoriasis skin. However, wounding of normal skin led to a DEG profile clustered most similarly with lesional psoriasis.

Conclusions DEGs that remained unchanged or different in "psoriasis-like" wounded skin may explain why a normal wound heals, but psoriasis persists in a chronic wound-like state. These findings suggest DEGs implicated and possibly targetable in the psoriasis pathway. RNA-seq identified inflammatory and immune-related DEGs significantly enriched in non-psoriatic skin but not normal, unwounded skin. This suggests that even non-lesional psoriatic skin is innately different from non-psoriasis patients. These DEGs should be further explored as possible markers and therapeutic targets of psoriasis.

Further studies with larger sample sizes and qRT-PCR are currently being done to confirm these findings.



Abstract 458 Figure 1

459 DELAYED RECOGNITION OF HYPER IGD SYNDROME LEADS TO PROLONGED INCORRECT MEDICAL CARE

B Jagadesan, M Hogan, NW Wilson. *University of Nevada School of Medicine, Las Vegas, NV*

10.1136/jim-d-15-00013.459

Case Report: Introduction Hyper IgD syndrome (HIDS) is a rare AR auto-inflammatory disease with periodic fever, joint pain, lymphadenopathy, abdominal pain, dermatitis, and hepatosplenomegaly. It is a life-long disease presenting during childhood due to decreased mevalonate kinase activity. Episode triggers include infections, vaccines and stress, although most episodes occur without a precipitating event. A persistently elevated IgD level confirms the diagnosis. Treatment with etanercept and anakinra is effective for severe symptoms.

Methods A chart review of patients seen Immunology clinic for HIDS over an 8 year period was performed.

Results 3 patients were found to meet the criteria for HIDS. **Pt. 1:** 20-year old female with a 16 year history of multiple hospitalizations for pneumonias, asthma exacerbations, and multisystem dysfunction: joint/abdominal pain, rash and multiple fevers. Thought to be a rheumatologic disease. IgD levels 32.40mg/dl (<14.11 mg/dl) **Pt. 2:** 6-year female presented with a 4 year history of periodic fevers, recurrent abdominal pain, joint pain and aphthous ulcers. Diagnosed as inflammatory bowel disease which was unresponsive to treatment. IgD level 21mg/dl. **Pt. 3:** 29-year old female presented for food allergy testing convinced she was allergic to her own hair. She complained of recurrent bloating, cramping/abdominal pain, fevers, rashes, since childhood. Diagnosed as celiac disease unresponsive to a gluten free diet. IgD level 19.3mg/dl.

Conclusions All three patients were ultimately diagnosed with HIDS with elevated IgD levels after prolonged illnesses with abdominal pain fevers, joint pain, rash and since childhood. Periodic fever may not be the most prominent symptom. All had been diagnosed with other disorders but were unresponsive to therapy. The correct diagnosis of HIDS has greatly decreased patient stress and has significantly reduced the number of clinic and hospital visits without requiring HIDS specific therapy. IgD level is readily available unlike testing for other periodic fevers. HIDS should be considered in those individuals with repeated rashes, joint pains, and abdominal pain associated with repeated fevers.

Neonatal Pulmonary IV
Concurrent Session
10:15 AM
Saturday, January 30, 2016

460 EARLY POSTNATAL STEROID USE IN PREMATURE INFANTS AND THE RISK FOR NECROTIZING ENTEROCOLITIS: A COMPREHENSIVE REVIEW

G Heredia,[1] A Patel,[1] C Chung,[1] J Yao,[1] K Sahrai,[1] P Sathe,[1] Y Michael,[1] B Afghani[1,2]. *[1]University of California, Irvine, Santa Ana, CA; [2]CHOC Hospital, Orange, CA*

10.1136/jim-d-15-00013.460

Purpose of Study While steroids are commonly used for prevention of respiratory distress syndrome in premature infants, their effect on necrotizing enterocolitis (NEC) remains unclear. The purpose of this study was to investigate whether early post-natal steroid use in premature infants was associated with increased risk of developing NEC.

Methods Used A search of Pubmed, Google Scholar, and the Cochrane database for systematic reviews for any clinical study about early post-natal steroid use in premature infants was conducted. Only prospective studies with controls which used postnatal steroids within the first 10 days of life were included in the analysis.

Summary of Results Ten studies that met the selection criteria were used in this study. Please see the table below for the summary of the results. Only one study showed a difference in the steroid vs. control group as the risk of NEC was lower in the steroid group.

Conclusions Our review did not demonstrate a straightforward association between early postnatal steroid use in premature infants and NEC. The limitations for majority of studies included small sample size, the various steroid dosages and schedules, and lack of long term follow-up. Future studies are needed to evaluate the effect of other variables, such as gestational age, birth weight and other comorbidities in relation to the use of antenatal steroid and its influence on the risk of NEC among premature infants.

461 THE ASSOCIATION OF CARDIOPULMONARY RESUSCITATION AND PATENT DUCTUS ARTERIOUSUS IN NEWBORNS

T Chavez, T Stavroudis, PS Friedlich, A garingo, J Shepherd, A Lakshmanan. *Center for Fetal and Neonatal Medicine, Division of Neonatal Medicine, Children's Hospital Los Angeles and LAC+USC Medical Center, Keck School of Medicine, University of Southern California, Los Angeles, CA, United States, Los Angeles, CA*

10.1136/jim-d-15-00013.461

Purpose of Study While it is recognized that cardiopulmonary resuscitation (CPR) is associated with increased risk for mortality, there is limited information about the association of patent ductus arteriosus (PDA) with CPR in newborns. Therefore, the objectives of this study are to: (1) To determine if health care resource utilization, primary diagnoses and procedures differed for infants who were diagnosed with a PDA; (2) To identify predictors of CPR.

Methods Used Data was obtained from the California Office of Statewide Health Planning and Development (OSHPD) birth cohort file for the years 2006 to 2010. ICD-9-CM codes were used to describe procedures and diagnosis. Bivariate analysis was used to describe differences between cohorts. Multivariable (MV) analysis was also completed to determine predictors of CPR.

Summary of Results 2,523,368 newborns were identified from 2006–2010, of which 268 patients received CPR. Among the CPR patients, 44.8% were diagnosed with a PDA. Statistically significant associations were evident with: length of stay (LOS) (No PDA: 25.2 days vs. PDA: 56.4 days [$p<0.001$]), mean charges ($/1k), (No PDA: 481.0 vs. PDA: 866.2 [$p<0.001$]), sepsis (%) (No PDA: 35.1 v. PDA: 49.2 [$p=0.02$]), thrombocytopenia (%) (No PDA: 7.4 v. PDA: 20.8 [$p<0.01$]), apnea (%) (No PDA: 11.5 v. PDA: 25.0 [$p<0.01$]) and respiratory distress (%) (No PDA: 11.5 v. PDA: 30.0 [$p=<0.01$]). Other differences are outlined in the table. On MV analysis, adjusting for insurance, sex, ethnicity, and LOS, having a PDA increased the odds of CPR by (AOR, 95% CI) 3.7 (3.0, 4.6) vs. no PDA.

Conclusions Infants with a PDA who required CPR had higher rates of respiratory distress, apnea, thrombocytopenia, sepsis, LOS, and charges. Having a PDA was a

Abstract 460 Table 1

First Author and Year	Gestational Age	Duration of steroids	Subject Steroids w/NEC	Subject Placebo w/ NEC	P value
Rastogi, 1996	first 12 days after birth	Over 12 days	2/35 (5.5%)	2/34 (5.0%)	NS
Sinkin, 2000	<30 weeks	2 doses	189/384 (49%)	195/384 (51%)	NS
Stark, 2001	Birth Weight (500 to 1000 g)	Over 10 days	14/111 (13%)	10/109 (9%)	NS
Suske, 2008	<34 weeks	Over 5 days	1/12 (8.3%)	2/14 (14.3%)	NS
Subhedar, 1997	<32 weeks	Over 6 days	2/12 (16.7%)	1/12 (8.3%)	NS
Romagnoli, 2002	<32 weeks	Over 3 days	2/15 (8%)	3/15 (12%)	NS
Anttila, 2005	<31 weeks	Over 2 days	8/53 (15%)	8/56 (14%)	NS
NG, 2006	<31 weeks	Over 2 days	2/24 (8%)	3/24 (12.5%)	NS
Halac, 1990	<32 weeks	Over 7 days	9/130 (6.9%)	17/118 (14.4%)	<0.05
Efird, 2005	<31 weeks	Over 5 days	2/16 (13%)	2/18 (11%)	NS

significant predictor of requiring CPR. Presence of a PDA should be considered when considering a newborn's risk for CPR. Further analysis should be conducted to rule out temporality issues in retrospective data.

462 EARLY CUMULATIVE SUPPLEMENTAL OXYGEN (O_2) EXPOSURE PREDICTS BRONCHOPULMONARY DYSPLASIA (BPD) IN EXTREMELY LOW GESTATIONAL AGE NEWBORNS (ELGAN)

K Wai, MA Kohn, R Ballard, D Black, RL Keller. *UCSF, San Francisco, CA*

10.1136/jim-d-15-00013.462

Purpose of Study Prolonged ventilation and O_2 therapy are associated with BPD; less is known about the predictive value of early neonatal supplemental O_2 exposure. We compared the utility of cumulative supplemental O_2 exposure for prediction of Death or BPD in ELGAN at various time points up to 28d.

Methods Used This is a secondary analysis from the randomized controlled Trial of Late Surfactant (TOLSURF). TOLSURF enrolled infants (n=511) who were ≤28 wks' gestational age (GA), intubated and ventilated at 7–14d, without serious anomalies or life expectancy <7d. The primary outcome was Death or BPD at 36 wks' GA, determined as need for support by physiologic O_2/flow challenge. Respiratory support settings were recorded 3x/d. Infants missing ≥1d of respiratory support data (n=16) were excluded. Supplemental O_2 (FiO_2–0.21) was averaged for each 24h. Cumulative supplemental O_2 (CSO) was the sum of supplemental O_2 over the time period of interest. Cumulative mean airway pressure (MAP) was calculated similarly. Area under the receiver operating curves (AUROC) were generated to evaluate the utility of CSO for prediction of Death/BPD. We compared AUROC in the first 28d, and performed logistic regression to evaluate the relationship between CSO and Death/BPD.

Abstract 462 Table 1

Time points	Day of life	AUROC (95% CI)	p-value
1d vs. 14d	1d	0.58 (0.52–0.63)	p=0.0001
	14d	0.70 (0.65–0.74)	
3d vs. 14d	3d	0.60 (0.55–0.65)	p=0.0002
	14d	0.70 (0.65–0.74)	
7d vs. 14d	7d	0.65 (0.60–0.70)	p=0.006
	14d	0.70 (0.65–0.74)	
10d vs. 14d	10d	0.67 (0.62–0.72)	p=0.04
	14d	0.70 (0.65–0.74)	
21d vs. 14d	21d	0.69 (0.64–0.74)	p=0.90
	14d	0.69 (0.64–0.74)	
28d vs. 14d	28d	0.70 (0.65–0.75)	p=0.38
	14d	0.69 (0.64–0.74)	

n varies from 475–488 for comparisons as infants drop out due to missing data (death).

Summary of Results At 14d, AUROC for CSO was significantly better than earlier time points and did not increase with addition of later data (Table). Increasing CSO at 14d increased the odds of Death/BPD (OR=1.6, p<0.001), after adjustment for MAP.

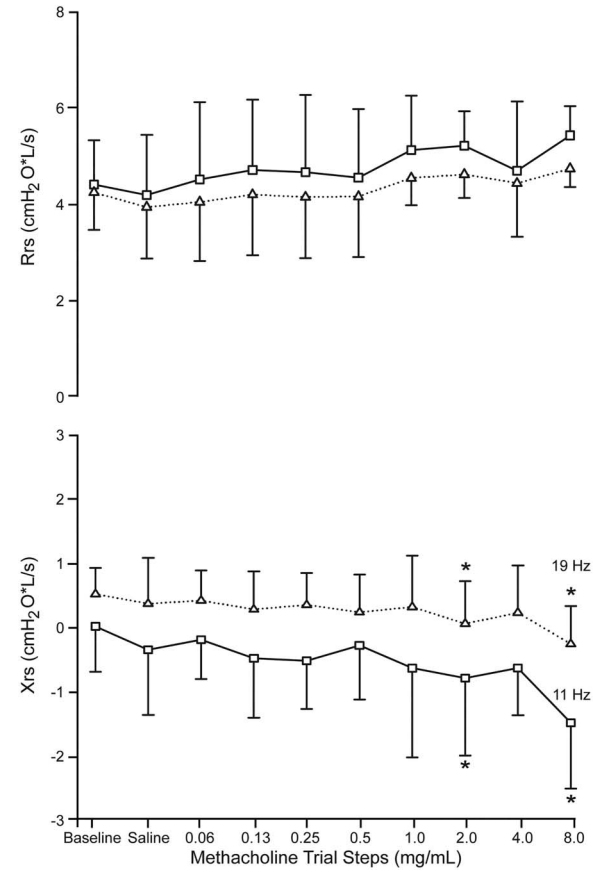
Conclusions Critical supplemental O_2 exposure predicts Death/BPD in the first 14d. This may identify infants who could benefit from early intervention to prevent BPD

463 RESPONSE TO METHOCHOLINE IN NORMAL TERM LAMBS ASSESSED BY FORCED OSCILLATION TECHNIQUE

C Veneroni,[2] M Dahl,[1] K Zuspan,[1] A Lavizzari,[3] S Bowen,[1] D Null,[4] B Yoder,[1] K Albertine,[1] R Dellaca'[2]. *[1]Univ of Utah, Salt Lake City, UT; [2]Politecnico di Milan, Milan, Italy; [3]Ospedale Maggiore Policlinico, Milan, Italy; [4]UC, Davis, Davis, CA*

10.1136/jim-d-15-00013.463

Purpose of Study Airway hyper-reactivity often accompanies bronchopulmonary dysplasia (BPD). Our premature lamb model uses former premature lambs that live for 5 months corrected postnatal age (~6 yr corrected postnatal age in humans) and provides a tool for functional insights on long-term respiratory consequences of BPD. We used forced oscillation technique (FOT) as a non-invasive



Abstract 463 Figure 1

method to assess respiratory mechanics in spontaneously breathing lambs. Methacholine (Mch) challenge is a standardized test to assess airway hyper-reactivity. Our objective was to develop a standardized Mch challenge protocol using FOT in term lambs.

Methods Used The response to Mch was determined by nebulizing increasing doses of Mch (0.06 to 8 mg/mL in doubling doses) through a facial mask to term lambs (age 3.5±1.1mo; n=10). Resistance (Rrs) and reactance (Xrs) values were recorded by FOT at 11 and 19Hz at baseline (B), after nebulization of saline (S), and after each increased dose.

Summary of Results Both Rrs and Xrs showed frequency dependence (higher responses at 19Hz) at all Mch dosages. Both Rrs and Xrs showed dosage dependence, with significant differences at higher dosages of Mch (*$p<0.05$vsB).

Conclusions Use of FOT during Mch challenge provides a non-invasive approach to identify airway hyper-reactivity in normal term lambs. Our results provide reference values to evaluate airway hyper-reactivity in former premature lambs. NIH HL110002.

464 RESOURCE UTILIZATION IN THE STATE OF CALIFORNIA FOR NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA 2006–2010

A Song,[1] PS Friedlich,[1] R Chapman,[1] R Burke,[2] J Upperman,[2] J Stein,[2] A Lakshmanan[1]. [1]*Children's Hospital Los Angeles, Los Angeles, CA;* [2]*Children's Hospital Los Angeles, Los Angeles, CA*

10.1136/jim-d-15-00013.464

Purpose of Study While it is recognized that congenital diaphragmatic hernia (CDH) 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. The aim of this study is to determine if health care resource utilization differed for survivors versus non-survivors and to identify predictors of LOS.

Methods Used We studied data from the California Office of Statewide Health Planning and Development (OSHPD) for the years 2006–2010 (birth cohort file). CDH patients were identified using ICD-9-CM codes (756.6); survival to discharge was determined based on OSHPD disposition codes. Bivariate tests were used to compare characteristics of survivors and non-survivors. LOS over years was also observed. Multivariable (MV) analysis was completed to identify predictors of LOS.

Summary of Results 2,523,368 newborns were identified during 2006–2010. Of the 205 CDH patients identified, mortality was 16%. Statistically significant differences were observed for several variables for survivors versus non-survivors outlined in the table. For survivors, on MV analysis, after adjustment for race, sex, insurance, gestational age, birth weight, use of extracorporeal membrane oxygenation (ECMO), other co-morbidities and California Children's Service NICU designation, LOS (SE) increased with ECMO use by 44 (9) days while LOS (SE) increased if white by 12 (5) days.

Conclusions Non-survivors required ECMO more. For survivors, LOS increased with ECMO use and decreased if the infant was white versus non-white. We identified several factors that could affect health care delivery for this high-risk population.

465 PREVALENCE OF DIAGNOSES ASSOCIATED WITH CHILDREN'S INTERSTITIAL LUNG DISEASE IN THE UNITED STATES 2012

CA Ulloa, A Song, A Lakshmanan, P Friedlich, N Iyer. *Children's Hospital Los Angeles, Chatsworth, CA*

10.1136/jim-d-15-00013.465

Purpose of Study Children's Interstitial Lung Disease (chILD) is a group of rare lung diseases that can occur in infants, children, and adolescents. Case ascertainment from multicenter collaborative studies have been used to describe patterns, and traits of chILD. Prevalence data and health care utilization derived from population databases is required to truly understand the load of chILD.

To estimate the prevalence of Children's Interstitial Lung Disease among diagnosed children two years and younger in the United States for 2012. 2.) To identify determinants of length of stay (LOS) and total hospital charges (THC) in neonates diagnosed with chILD.

Methods Used An observational study, using national data from the Kid's Inpatient Database for 2012. KID is an administrative database from the Health Care Cost and Utilization Project (HCUP). Weighted variables, such as discharge weight, were applied for national estimates. Neonates, 2 years or less in age, with a primary diagnoses of least one of the associated chILD diagnoses following ICD-9-CM codes were included.

Summary of Results There were 91 cases of chILD identified in 2012. There were no identified cases between the years 1997–2009 and data from those years were excluded. Due to the low sample size, characteristics were stratified by the remaining associated chILD diagnoses (see Table 1). Survival at discharge was 98% and the majority of the cases were white (58%) females (57%) with Medicaid insurance (62%) with disposition to routine care (83%). The hospital was predominately an urban teaching hospital (92%) although regions varied, and bed size was primarily large (75%). All diagnoses had the majority of patients recorded as not an in-hospital birth. The mean for total charges ranged from 1.27 to 8.80 per 100 thousand dollars and the LOS ranged from 9.5 to 40 days among the diagnoses.

Conclusions The chILD identified cases in 2012 were mostly white females with Medicaid insurance and disposition to routine care. The diagnosed cases varied mostly by region of hospital, LOS, and THC. The information collected can be used to assess the prevalence of chILD in the United States.

Neonatology General VI
Concurrent Session
10:15 AM
Saturday, January 30, 2016

466 SHORT-TERM OUTCOMES OF NEONATES WITH MILD HYPOXIC-ISCHEMIC ENCEPHALOPATHY AFTER THERAPEUTIC HYPOTHERMIA

M Kirkley,[1] S Kaseman,[2] J Gralla,[3] D Melara,[2] T Grover,[2] C Delaney[2]. *[1]University of Colorado, Aurora, CO; [2]Children's Hospital Colorado, Aurora, CO; [3]Children's Hospital Colorado Research Institute, Aurora, CO*

10.1136/jim-d-15-00013.466

Purpose of Study Therapeutic hypothermia (TH) is the only intervention proven to improve neurodevelopmental outcome in moderate-to-severe hypoxic-ischemic encephalopathy (HIE). No studies to date specifically address the use of TH for infants with lesser degrees of HIE.

Methods Used This single-center, retrospective study identified all infants with mild HIE (defined by Sarnat staging), who received TH at Children's Hospital Colorado between 2007 and 2014. We reviewed the clinical data, including cerebral function monitoring (CFM), EEG, and MRI findings for each infant. Primary outcomes were survival, length of stay, time to full enteral feeding, need for supplemental oxygen, and need for antiepileptic medication. Secondary outcomes were abnormal findings on CFM at 1, 24, 48, and 72 hours of TH, and abnormal findings on EEG or MRI obtained at the conclusion of the 3-day cooling period.

Summary of Results 230 infants received TH during the study period. 37 (16%) had mild HIE. 100% of these infants survived to discharge after a median length of stay of 10 days. CFM record was available in 33/37 infants (89%), and was abnormal at one or more time points in 22 (74%) of these infants. Clinical seizures were observed in 8 infants (21%). EEG background was abnormal in 30 infants (81%), and electrographic seizures were seen in 6 infants (16%). 13 infants (35%) had an abnormal brain MRI, including 5 infants (14%) with either watershed-predominant or deep gray matter lesions. The majority of infants were feeding entirely by mouth and breathing ambient air at discharge; however, 1 infant required NG feedings, 6 infants (16%) required supplemental nasal cannula oxygen, and 3 infants (8%) were prescribed an antiepileptic medication.

Conclusions One-sixth of neonates who underwent TH at Children's Hospital Colorado during the study period had mild HIE. While these infants overall had good outcomes, a substantial percentage had CFM, EEG, or MRI findings known to correlate with neurodevelopmental impairment in infants with greater degrees of HIE. The short-term adverse consequences of mild HIE may be underappreciated, and these infants may be at risk for long-term neurologic sequelae.

467 BEDSIDE BLOOD GAS VS. LABORATORY ANALYSIS OF SODIUM: IS THERE A DIFFERENCE?

T Glasberg, T Chavez, R Ramanathan, A garingo. *USC, Los Angeles, CA*

10.1136/jim-d-15-00013.467

Purpose of Study Sodium levels are assessed by central laboratory analyzers using indirect ion selective electrodes (ISE) or blood gas analyzers using direct-ISE. Sodium measurements using indirect ISE can be spuriously elevated or seemingly normal in the setting of low protein levels. Sodium levels from direct ISE are thought to be less affected by protein levels in the blood. We compared sodium levels measured by indirect-ISE and direct-ISE in infants to evaluate the effect of albumin levels on these measurements.

Methods Used Data was collected retrospectively from medical charts at a single center, community level IIIa NICU from January 2012 to December 2014. The study cohort included infants admitted to the NICU with at least one electrolyte panel assessed in the laboratory and a blood gas analysis performed within 20 minutes of the laboratory specimen. Samples for the central laboratory were analyzed with indirect-ISE and samples by blood gas analyzer with direct-ISE. Variables collected were sodium levels as well as albumin levels from the laboratory specimen. Statistical analysis was performed using student t-test comparing direct and indirect-ISE measurements of sodium with and without stratification of albumin levels. We defined a sodium difference of 3 mmol/L (indirect-ISE minus direct-ISE) as unacceptable and hypoalbuminemia as less than 2.5 g/dL.

Summary of Results We identified 392 infants (mean birth weight 2551 grams [SD+965] and mean gestational age 35 weeks, 3 days [SD±4 weeks]). 392 paired blood samples were included. Blood gas analyzer mean sodium was significantly lower compared to laboratory mean sodium. When sodium levels were stratified based on albumin level, there continued to be a significant difference in sodium levels between the two specimens, but not the anticipated higher sodium levels in the indirect-ISE samples.

Conclusions There is a statistically significant difference in sodium levels measured by direct and indirect-ISE but, unlike prior studies, we found no change in the sodium difference when albumin levels were assessed

Abstract 467 Table 1 Blood Gas Sodium vs. Lab Sodium Measurements Based on Albumin Levels

Albumin Level (g/dL) (# of samples)	Blood Gas Sodium (mmol/L) mean±SD	Lab Sodium (mmol/L) mean ±SD	p-value
albumin<2.5 (64)	133.2±4.3	137.7±4.1	p<0.001
albumin ≧ 2.5 (328)	133.4±3.4	138.6±3.2	p<0.001
total n=392	133.4±3.6	138.5±3.4	p<0.001

468 QUALITY REPORT VIEWING BY NEONATAL PROVIDERS AND RELATIONSHIP TO QUALITY INDICATORS

N Wahid,[1] M Bennett,[2] J Gould,[2] J Profit,[2] HC Lee[2]. [1]*University of California, Irvine, Irvine, CA;* [2]*Stanford University, Stanford, CA*

10.1136/jim-d-15-00013.468

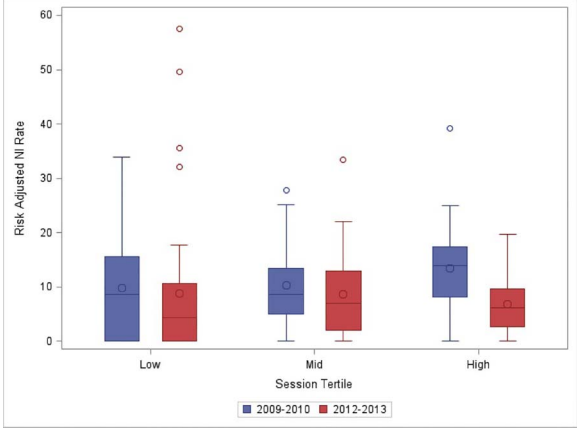
Purpose of Study Assess whether there is a correlation between viewing quality reports and improvements in quality indicators over time.

Methods Used NICUs within California Perinatal Quality Care Collaborative (CPQCC) were grouped by characteristics to measure variation in report viewing session counts. NICUs were stratified into tertiles based on their antenatal steroid use (%ANS) and adjusted nosocomial infection rate (%NI) in 2009–2010 to compare report sessions counts. NICUs were then stratified into tertiles based on their report viewing counts between July 2009-June 2011 to assess change in adjusted %NI between 2009–2010 and 2012–2013.

Summary of Results The number of report sessions initiated by providers varied widely. Facilities with higher %ANS generally had more report sessions, and NICUs in the highest %ANS tertile had a correlation between more session counts and higher %ANS (P=0.020). The low %NI tertile (best quality) had a correlation between more report sessions and higher NI rates (worse quality) (P=0.023). Facilities with the highest report viewing had considerable improvements in adjusted NI rates over time (see figure).

Conclusions Facility viewing of quality reports plays a role in the success of quality improvement networks. While a NICU's report session count is a general marker for the facility's antenatal steroid use, nosocomial infection rate has a more complex relationship with report sessions, perhaps because of the higher task complexity involved in improving NI rates.

Session tertiles are based on each facility's report sessions counts between July 2009 and June 2011.



Abstract 468 Figure 1

469 THE IMPACT OF PREMATURITY ON LOW-INCOME FAMILIES AFTER NICU DISCHARGE: IDENTIFYING MODIFIABLE PREDICTORS

AM Yeh, NG Lynch, A Diamond, N Flores, R Polcyn, J Eshagian, DL Vanderbilt, PS Friedlich, A Lakshmanan. *Center for Fetal and Neonatal Medicine, Division of Neonatal Medicine, Children's Hospital Los Angeles and LAC+USC Medical Center, Keck School of Medicine of University of Southern California, Los Angeles, CA*

10.1136/jim-d-15-00013.469

Purpose of Study (1) To describe the impact on family and parental burden of high risk preterm infants in low-income families (2) to identify salient modifiable predictors of negative and positive family and parental impact.

Methods Used We administered a 120-item survey to mothers of 153 preterm infants attending a high-risk infant follow up program (85% response rate). Primary outcomes were (1) the total score on the Impact on Family Scale (IOF) (higher scores indicate worse effects on family functioning) (2) the Infant Toddler Quality of Life (ITQOL) parent-focused increased anxiety/emotion and (3) ITQOL parent-reported limitation of time (lower scores indicate increased parental burden). Multivariable (MV) analysis was also completed.

Abstract 469 Table 1

	Adjusted estimate of coefficient (SE), p value		
	IOF	Parent-Emotion	Parent-Time
Predisposing Characteristics			
Post-Discharge Diagnosis	6.7 (3.1), 0.03	–5 (7.5), 0.5	–1.3 (7.9), 0.8
Receives prescription medication daily	6.8 (2.7), 0.01	–11 (6), 0.04	–0.7 (6), 0.9
Enabling Resources			
Use of community based resources			
Food insecurity programs (WIC, SNAP)	–2.9 (2.4), 0.2	1.6 (4.9), 0.7	12.7 (4.9), 0.01
Financial Burden			
≥ 3 hours from work without pay	7.3 (3.4), 0.03	1 (0.8), 0.7	–2.8 (6.3), 0.7
Health Related Social Problems			
Unsafe home environment	–1.3 (2.3), 0.6	–14 (6.6), 0.04	–14.7 (6.6), 0.03
Social isolation	8.6 (2.6), 0.0002	–13 (4.7), 0.0066	–19 (4.5), <0.0001

Summary of Results 74% of participants were Hispanic and 63% reported an annual household income <$20,000. Adjusting for socio-demographic factors, gestational age, and co-morbidities of prematurity, having a post-discharge diagnosis, using prescription medications, uncompensated time off work, an unsafe home and social isolation increased parental and family impact. However, use of food insecurity programs actually lessened parent-time impact (Table 1).
Conclusions Modifiable factors such as financial burden, an unsafe home and social isolation were identified as predictors of increased parental and impact on family, while enrollment in food insecurity programs mitigated impact on parental time.

470 THE ASSOCIATION OF THE PATIENT HEALTH QUESTIONNAIRE-2 WITH HEALTH-RELATED QUALITY OF LIFE MEASURES IN LOW-INCOME MOTHERS AFTER NICU DISCHARGE

A Diamond, AM Yeh, N Lynch, N Flores, J Eshagian, R Polcyn, A Pham, DL Vanderbilt, P Jackson, PS Friedlich, A Lakshmanan. *Center for Fetal and Neonatal Medicine, Division of Neonatal Medicine, Children's Hospital Los Angeles and LAC+USC Medical Center, Keck School of Medicine of University of Southern California, Los Angeles, CA*

10.1136/jim-d-15-00013.470

Purpose of Study: Background The prevalence of maternal depression after preterm birth is widely recognized and the Patient Health Questionnaire 2 (PHQ-2) has been validated to screen for this condition. However, there is limited information about the association of the PHQ-2 with other health-related quality of life (HRQoL) measures.
Objective Describe the association of the PHQ-2 with HrQoL measures in a population of low-income mothers of preterm infants after NICU discharge.
Methods Used We administered a 120-item survey to mothers of preterm infants attending a high-risk infant follow up program. Our primary outcome was a positive screen for depression determined by a score > 3 on the PHQ-2. T-tests were used to compare a positive depression screen with the following HRQoL measures: (1) Impact on Family Scale (IOF) (higher scores indicate worse family functioning), (2) Infant and Toddler Quality of Life Questionnaire (ITQOL) (3) Multicultural Quality of Life Index (lower scores indicate increased parental burden).
Summary of Results Of 153 participants (85% response rate): 74% of participants were Hispanic and 63% reported an annual household income <$20,000. 32% of mothers screened positive for depression based on the PHQ-2. A positive PHQ-2 screen was associated with lower HRQoL for most measures (Table 1).
Conclusions A positive PHQ-2 screen was associated with lower HRQoL on most measures, which should be considered with screening.

Abstract 470 Table 1

	(+) PHQ-2 screen	(−) PHQ-2 screen	p-value
Mean (SD) scores for sample			
IOF, 34.4 (10.8)	39.3 (9.6)	31.8 (10.6)	0.001
ITQOL, parent-emotion, 78.3 (22.4)	77.8 (19.4)	78.4 (24)	0.9
ITQOL, parent-time, 78.3 (23.2)	68.4 (23)	84.4 (20)	0.0005
MCQLI, 8.5 (1.5)	8.1 (1.2)	8.8 (1.2)	0.01

471 ASSISTED HOME FEEDING: PREVALENCE AND RISK FACTORS IN NEONATES AT DISCHARGE FROM THE NICU

B White,[1] C Zang,[2] AP Presson,[2] K Friddle,[3] R DiGeronimo[1,4]. *[1]University of Utah School of Medicine, Salt Lake City, UT; [2]University of Utah School of Medicine, Salt Lake City, UT; [3]University of Utah, Salt Lake City, UT; [4]University of Utah School of Medicine, Salt Lake City, UT*

10.1136/jim-d-15-00013.471

Purpose of Study Critically ill neonates often have delays in establishing full oral feedings that may necessitate assisted home feedings (AHF). The criteria for AHF, mode of feeding delivery, and optimal timing for discharge are poorly understood. This study aims to characterize the demographic and clinical variables associated with AHF to help investigate these questions.
Methods Used We conducted a retrospective cohort study on all admissions from a single tertiary referral children's hospital NICU over a 5-year period. Infants admitted >1 day and who survived to discharge with a complete dataset met inclusion criteria. Characteristics and outcomes were compared between infants discharged on full oral feedings (PO) versus those who required AHF, defined as nasogastric (NG), naso-transpyloric (NJ) or gastrostomy/gastrojejunostomy (GT) feedings. Univariate logistic regressions were used to identify factors that predicted AHF. Readmissions within 12 months following discharge were tracked to assess for potential complications.
Summary of Results Of 1494 infants who met inclusion criteria, 406 (27%) were discharged on AHF. Of these, 218 (54%) were NG, 158 (39%) GT, and 30 (7%) were NJ. Regression analysis identified several factors predictive of AHF including gestational age (GA), postmenstrual age at discharge, birth weight, oxygen need at discharge, and surgical small bowel ostomy, among others. A greater percentage of infants in the AHF group were readmitted (16% vs. 9% for PO, $p<0.001$), however only 2 (3%) of these were attributable to a feeding tube complication.
Conclusions In our population of high-risk neonates, AHF at discharge was common and appears reasonably safe with a low risk of readmission and/or complications. Many factors reflecting greater prematurity and morbidity were associated with discharge home on AHF. A better understanding of the clinical characteristics of these infants and potential predictive variables for AHF may facilitate more appropriate timing for discharge and a shorter hospital admission.

Neonatology - Perinatal Biology III
Concurrent Session
10:15 AM
Saturday, January 30, 2016

472 NORMALIZATION OF N–3 FATTY ACIDS DURING WEANING PROTECTS AGAINST TRANSFER OF MATERNAL WESTERN STYLE DIET INDUCED DYSBIOSIS AND INFLAMMATION

TK Soderborg, J Friedman, D Lemas, S Santorico, B De la houssaye, RC Janssen, D Frank. *University of Colorado Anschutz, Aurora, CO*

10.1136/jim-d-15-00013.472

Purpose of Study Gut microbiota have emerged as an integral factor in metabolic health and disease. The effect of maternal diet on development of the infant gut microbiome (MB) and its role in conferring metabolic risk are poorly understood. OBJECTIVE: 1. Characterize the gut MB and inflammatory state in pups born to western-style diet (WSD) fed dams. 2. Describe the impact of maternal and offspring fatty acid expression using the fat-1 transgene which endogenously converts pro-inflammatory n–6 to anti-inflammatory n–3.

Methods Used Dams were fed chow (12% kCal fat) or WSD (42% kCal fat, 0.2% cholesterol, 34% sucrose) ad libitum. Pup cecum and blood were collected on post-natal day (PND) 14 and tissues were collected on PND 20. Plasma recombinant factor C assay for lipopolysaccharide (LPS) was performed to assess gut membrane leakage of bacterial products. 16S rRNA gene amplicon sequencing was used to profile microbiota. qPCR was used to measure Treg cell expression of IL-10 and TGF-b .

Summary of Results Maternal WSD significantly reduced pup MB diversity ($p<0.001$), decreased Actinobacteria ($p=0.02$) and Bacterodetes ($p=0.04$), and increased Firmicutes ($p=0.001$). These changes were accompanied by lower splenic and elevated liver IL-10 ($p=0.001$, $p=0.03$) and TGF-b ($p=0.02$, $p=0.048$) expression, suggesting decreased anti-inflammatory cytokine production and liver damage. MB diversity did not differ between diets based on maternal or pup fat-1 expression ($p=0.35$, $p=0.96$), suggesting no effect of WSD-induced decrease in MB diversity. Fat-1 expression in pups was associated with decreased Firmicutes ($p=0.04$) and Tenericutes ($p=0.04$) and a trend for reduced LPS after WSD exposure ($p=0.07$).

Conclusions Maternal WSD suppresses offspring gut microbial diversity and induces host inflammation. A reduced n–6:n–3 ratio in milk or host tissues may serve as a therapeutic target to prevent transmission of metabolic disease.

473 INSIGHTS INTO PROTECTION FROM HYPOXIC INJURY FROM A ZEBRAFISH GENETIC MODEL

FB Imam. *University of California, San Diego, La Jolla, CA*

10.1136/jim-d-15-00013.473

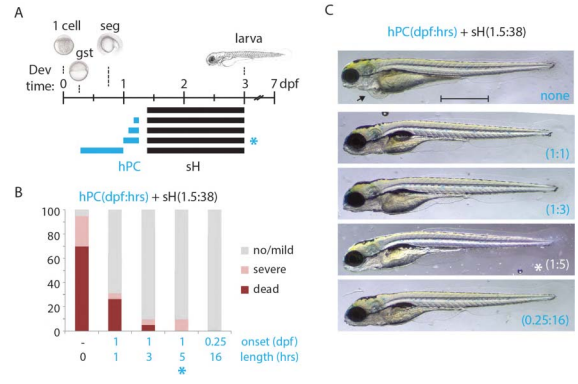
Purpose of Study Injury to developing organs at birth can lead to cerebral palsy, neurocognitive impairment, and other learning and behavior disabilities. Interestingly, a remarkable phenomenon known as hypoxic preconditioning arises when a brief hypoxia exposure leads to substantial protection against subsequent, severe hypoxia. Although the protective phenomenon of hypoxic preconditioning (hPC) has been demonstrated in several model organisms, its molecular underpinnings remain poorly understood and are likely distinct from the acute hypoxia response. Accordingly, our aim is to discover novel hypoxia-protective genes using a functional genomic approach in a zebrafish developmental stress model.

Methods Used Previously, we established conditions for reproducible acute hypoxic injury at various stages of development, including optimization of a robust hypoxic preconditioning protocol that was able to protect against an overwhelmingly lethal hypoxia exposure (Fig. 1). To identify differentially expressed transcripts induced by hypoxic stress, we utilized genome-wide transcriptional profiling at gastrula and segmentation stages. We subsequently validated the hypoxia-inducibility of highly-induced genes individually and then tested individual gene function via knockdown in the hPC assay.

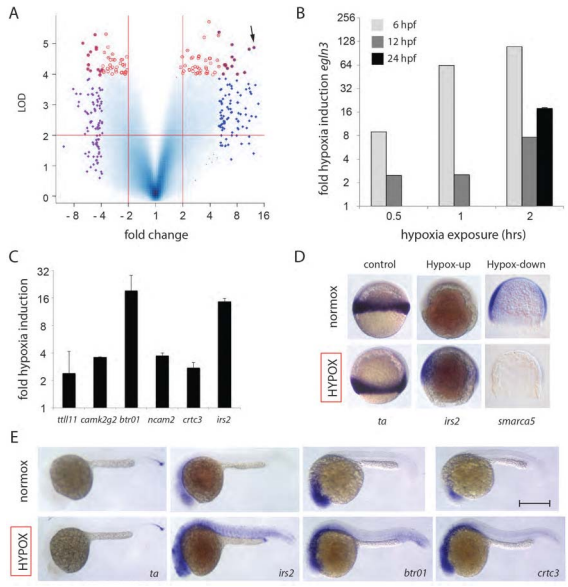
Summary of Results Analysis of these data prominently identified the prolyl hydroxylase egln3 (Fig. 2A, arrow; 2B), a key regulatory enzyme of the Hif1a response pathway, as the single most highly-upregulated and statistically significant gene detected, among multiple additional novel or uncharacterized hypoxia-regulated genes. Hypoxia-regualted expression was validated for individual candidates with qPCR or in situ hybridization, and further functional characterization with antisense oligonucleotide injection and mRNA rescue (n=11). Of six morphants without global defects in normoxia, five showed significant impairment of hPC in comparison to control-MO-injected embryos, including genes functioning in the insulin, cAMP/creb, and hematopoiesis pathways (Fig. 2C-E; Manchenkov et al., 2015, G3:Genes|Genomes|Genetics).

Conclusions These results demonstrate that the embryonic stress model in zebrafish can be used for discovery of novel hypoxia response genes essential for hypoxic preconditioning, and that “tuning” of energy metabolism contributes to hypoxia protection.

Hypoxic preconditioning can protect against acute



Abstract 473 Figure 1



Abstract 473 Figure 2

hypoxic injury. Genome wide expression screen identifies novel hypoxia regulated genes.

474 MATERNAL TOBACCO SMOKE EXPOSURE SEX-SPECIFICALLY DECREASES LIVER DESATURASE AND ELONGASE ENZYME MRNA LEVELS IN THE RAT

K Goodwin, C Weinheimer, L Joss-Moore. *University of Utah, SLC, UT*

10.1136/jim-d-15-00013.474

Purpose of Study Maternal tobacco smoke (MTS) exposure results in intrauterine growth restriction (IUGR) and alterations in fetal levels of circulating polyunsaturated fatty acids (PUFA). In preterm neonates altered levels of circulating PUFA are associated with neonatal lung disease and sepsis. Metabolism of PUFA in the fetus is performed by liver desaturase and elongase enzymes. We previously demonstrated that liver desaturase enzyme expression and function, as well as circulating PUFA are sex-specifically altered in a surgical rat model of IUGR. We also demonstrated sex-specific alterations in circulating PUFA following MTS-induced IUGR in the rat. However, the effect of MTS-IUGR on liver desaturase mRNA expression in the rat is unknown.

We hypothesize that MTS-IUGR sex-specifically alters the mRNA expression of liver desaturase enzymes FADS1 and FADS2, as well as liver desaturase enzymes ELOVL2 and ELOVL5 in the rat.

Methods Used Pregnant rats were exposed to tobacco smoke (MTS) or room air (Control) from E11 to term (E21). Rat pups were killed at birth and livers collected. Real-time RT PCR was used to measure mRNA transcript levels of FADS1, FADS2, ELOVL2 and ELOVL5.

Summary of Results Results are MTS as % sex-matched control±SD, *$p<0.05$ by ANOVA. In male liver, MTS exposure decreased mRNA levels of EVOL2 (61±11%*). In female liver, MTS decreases mRNA levels of FADS2 (70±16%*) and EVOL2 (72±6%*). MTS did not alter the mRNA levels of FADS1 or EVOL5 in either sex. Liver mRNA levels of FADS2 and EVOL5 were lower in male control liver compared to female control liver (67±16%* and 72±21%* respectively), whereas FADS1 and EVOL2 mRNA levels were similar between male and female liver.

Conclusions MTS-IUGR sex-specifically alters the mRNA expression of the liver desaturase FADS2 and the liver elongase EVOL2. We speculate that MTS-IUGR will similarly alter protein levels and function of FADS2 and EVOL2. Ongoing work is evaluating mechanisms by which IUGR alters mRNA expression of liver FADS2 and EVOL2.

475 LUNG SETD8 MRNA EXPRESSION PEAKS DURING ALVEOLAR FORMATION IN THE RAT

JT Zhao, Y Yang, R Knecht, L Joss-Moore. *University of Utah, Sandy, UT*

10.1136/jim-d-15-00013.475

Purpose of Study Impaired lung development is a hallmark feature of neonatal lung disease. A novel player in lung development is the SET-Domain methyltransferase, Setd8. Setd8 specifically methylates lysine 20 of the histone 4 N-terminal tail. The resultant epigenetic mark ($H4K20me^1$) has roles in cellular proliferation and differentiation, as well as Wnt signaling – all critical components of lung development. Despite the important role of Setd8 in lung development, the timing Setd8 expression relative to lung development is unknown. In this study, we characterized Setd8 expression in the rat lung during the saccular to alveolar transition.

We hypothesize that lung mRNA transcript levels of Setd8 will increase between birth (saccular) and postnatal day 7 (d7: alveolar formation), subsequently dropping again at day 21 (mature lung) in the rat.

Methods Used Sprague-Dawley rat lungs were examined at three time points during saccular-alveolar transition, birth d0, d7 and d21. Rats were killed at respective timepoints and lungs harvested. Real-time RT-PCR was used to measure Setd8 mRNA transcript levels in lung homogenate.

Summary of Results Results are mean±SD expressed relative to d0 levels. Lung levels of Setd8 mRNA transcript do not vary between male and female rat pups at d0, d7 or d21. In both male and female rats, lung levels of Setd8 mRNA increase during alveolar formation at d7 (male: 450±65%*; female: 436±92%*). In the mature lung at d21, male and female lung Setd8 mRNA levels remain increased relative to d0 (male: 360±170%*; female: 394±73%*), but are significantly less than d7. *$p \leq 0.05$ compared to d0.

Conclusions Lung mRNA transcript levels of Setd8 increase during alveolar formation in both male and female rat lungs. Our results are consistent with the demonstrated importance of Setd8 in alveolar formation. Ongoing studies are characterizing lung protein abundance of Setd8, as well as genome-wide levels of the $H4K20me^1$ mark.

476 CEREBRAL VENTRICULAR VOLUMES IN FETUSES AND NEONATES WITH CONGENITAL HEART DISEASE:A LONGITUDINAL STUDY

C Hayek,[1,2,3] V Rajagopalan,[2] J Meouchy,[1,3] L Paquette[2,1,3]. [1]*LAC+ USC Medical Eenter, Los Angeles, CA;* [2]*Children's Hospital Los Angeles, Los Angeles, CA;* [3]*University of Southern California, Los Angeles, CA*

10.1136/jim-d-15-00013.476

Purpose of Study Despite advances in perioperative and intraoperative care, children with congenital heart disease (CHD) remain at risk for long-term neurodevelopmental deficits. Neuroimaging measures demonstrate delayed brain development in the term CHD population, in utero and prior to surgery.The objective of this study is to test the hypothesis that neonatal brain dysmaturity in infants with CHD begins prenatally and persists in the neonatal period.

Methods Used Fetal (1.5T), pre- and post-operative (3.0T) brain MRIs were obtained on each patient and analyzed post-hoc. Fetuses with heart malformations likely requiring invasive intervention (surgery, catherization) within the first month after birth were included. Brain malformations, known genetic abnormalities, prenatal infections excluded eligibility. One imaging time point was omitted if the patient was determined to be unstable. Volumetric measurement was done using ITK-SNAP (Yushkevich, 2014).

Summary of Results A total of 10 subjects with CHD had fetal (at 25-38wks post-menstrual age [PMA]) and post-operative neonatal brain MRI (at 41–48wks PMA). One infant with Tetralogy of Fallot had large ventricles prenatally (1.55E+04 mm3); this volume decreased by 51% after repair.Infants with transposition of the great arteries, Ebstein, and prenatally treated hypoplastic left heart syndrome (HLHS) did not demonstrate a decrease in the postnatal ventricular volumes compared to the fetal volumes. Infants with HLHS were noted to have a significant decrease in their prenatal ventricular volumes post-operative with a mean decrease of 31%±5.5.

Conclusions The longitudinal evaluation of brain ventricular growth with MRI in fetuses and neonates with CHD shows differences in brain development. Fetuses with CHD have large ventricular volumes in utero, suggesting that altered fetal hemodynamics and/or reduced cerebral oxygen delivery in utero may predispose to neonatal brain dysmaturation. Such reasoning could explain the post-operative decrease in ventricular size of HLHS cases after more forward blood brain flow is established. Larger samples are needed to compare volumetry with different heart lesions, clinical courses, and controls.

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477 NEURON-TARGETED CAVEOLIN-1 ATTENUATES TRAUMATIC BRAIN INJURY-MEDIATED MOTOR AND COGNITIVE DEFICITS

ES Posadas,[1,2] J Egawa,[1,2] J Schilling,[1,2] P Patel,[1,2] B Head[1,2]. [1]*University of California, San Diego, San Marcos, CA;* [2]*VA San Diego Health Care System, San Diego, CA*

10.1136/jim-d-15-00013.477

Purpose of Study Traumatic brain injury (TBI) is the leading cause of mortality and morbidity in the Western world. Caveolin (Cav) is a cholesterol binding protein and scaffolding protein found within membrane/lipid rafts (MLR). Previous work from our group demonstrated that neuron-targeted Cav-1 enhances MLR formation, increases pro-growth signaling, and promotes neuritic growth in primary neurons. The present study utilized neuron-targeted Cav-1 overexpressing transgenic mice (SynCav1 TG) in our TBI model followed by motor and cognitive testing to assess Cav-1 as a therapeutic target for TBI.

Methods Used C57BL/6 wild type (WT) and SynCav1 transgenic (TG) mice were assigned to 4 groups: sham TG negative, TBI TG negative, sham TBI positive, and TBI TG positive. A burr hole was made 4 mm anterior to posterior from the bregmatic suture and 4 mm laterally from the sagittal suture over the right hemisphere. Using a stereotaxic impactor, a 3 mm tip was accelerated down to a 1 mm depth at a speed of 5 m/s. Motor tests were performed at baseline and weekly post impact. Cognitive tests were performed 49 days post impact. After completion of behavioral testing, tissue was prepared for histology to assess dendritic arborization and biochemistry to assess changes in MLR-localized synaptic proteins.

Summary of Results SynCav1 TG positive mice showed a significant ($p<0.05$, n=4 mice/group) increase in Cav-1, PSD95, NMDAR2A (NR2A), NR2B, and TrkB protein expression in tissue homogenates. TBI caused a significant deficit in holding impulse ($p=0.0002$, body weight×seconds, g*sec, n=14-20), balance beam ($p=0.037$, number of foot slips), and hippocampal-dependent contextual fear conditioning ($p=0.02$, % freezing), but not cued freezing, at 49 days post impact ($p<0.05$, n=14–20 mice/group). SynCav1 positive TG mice that were subjected to TBI

showed a significant increase in percent freezing in contextual (p=0.02, n=12), but not cued fear conditioning when compared to TBI TG negative mice (n=13) at 49 days post impact.

Conclusions We demonstrate that SynCav1 TG mice have enhanced MLR-localized protein expression of Cav-1 and synaptic-associated pro-survival and pro-growth signaling components. SynCav1 TG mice are less vulnerable to TBI-mediated contextual fear memory deficits.

478 HIERARCHICAL PROCESSING OF VISUAL STIMULI IN INDIVIDUALS WITH NEPHROPATHIC CYSTINOSIS AND OBLIGATE HETEROZYGOTES

AV Sathappan, D Trauner. *UCSD School of Medicine, La Jolla, CA*

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Purpose of Study Previous studies have shown that individuals with cystinosis may exhibit problems with visual spatial tasks. Specifically, the right parietal lobe is thought to be involved in synthesizing various aspects of a visual scene into a coherent whole (global processing), while the left parietal lobe mediates the processing of the details of a visual scene (local processing). Our laboratory has previously identified structural differences in the parietal lobes of cystinosis patients through the use of MRI. This study was designed to determine whether individuals with cystinosis and carriers of the cystinosin gene mutation show deficits in global and/or local processing as a result of their parietal lobe differences.

Methods Used A test of hierarchical processing was administered to controls, carriers, and patients with cystinosis. The 10 hierarchical stimuli used consisted of small, local figures that were positioned in a matrix to form a larger, global image (i.e. a large D made of small Y's). For each stimulus, participants were given 5 seconds to study the image followed by a 5 second pause, and then the participant was instructed to reproduce the image from memory. Study participants included 22 children and adults with cystinosis, 25 adult carriers of the cystinosis gene, and 57 age-matched controls.

Summary of Results Compared to the control subgroups, adult and child cystinotics as well adult carriers demonstrated significant deficits in the global processing of a hierarchical stimulus against a background of normal local processing. Child cystinosis patients also performed significantly more poorly than controls on all error subtypes except local shape distortion. In the adult population, both adult cystinosis patients and carriers made significantly more global shape distortion errors than the controls.

Conclusions The cognitive profile documented in cystinosis patients and carriers includes particular deficits that fall under the realm of visual spatial processing errors, specifically difficulties with the global processing of an image. These results provide insight into the role that the CTNS gene mutation has on neurodevelopmental differences seen in these individuals. Knowledge of such deficits will empower cystinosis patients to better understand and receive help with these areas of potential challenge.

479 RELIABILITY AND VALIDITY OF THE 6-MINUTE WALK TEST AS AN OUTCOME MEASURE IN OCULOPHARYNGEAL MUSCULAR DYSTROPHY

M Fernandez,[1] S Youssof[2]. [1]*The University of Arizona, Tucson, AZ;* [2]*The University of New Mexico, Albuquerque, NM*

10.1136/jim-d-15-00013.479

Purpose of Study Oculopharyngeal muscular dystrophy (OPMD) causes ptosis, dysphagia, and limb weakness. Validated outcome measures for use in clinical trials have not been established. The 6-minute walk test (6 MWT) is a widely used measure in other neuromuscular diseases. We

Abstract 479 Table 1 Known Groups Validity

Outcome Measure	OPMD (mean, ±SD)	Controls (N=20, mean, ±SD	p-value
MMT percent score	86.9±9.3	97.8±3.6	0.0000
Hip Flexion HHD (pounds)	30.5±12.7	44.1±13.4	0.0011
Grip strength (pounds)	56.1±20.7	72.2±18.9	0.0094
4 stair climb (seconds)	3.9±1.6	2.4±0.4	0.0001
4 meter walk (s)	4.1±0.8	3.5±0.7	0.0136
10 meter walk (s)	6.4±1.5	5.0±0.6	0.0003
Timed up and Go test (s)	10.7±2.6	8.5±1.3	0.0015
6 minute walk test (m)	387.4±82.8	463.4±73.2	0.0023
2 minute walk test (m)	134.0±26.9	155.5±23.3	0.0066
NeuroQOL upper extremity	49.6±8.4	51.8±4.1	0.2909
NeuroQOL lower extremity	44.1±8.8	56.0±5.7	0.0000
PROMIS Physical Function	43.4±8.0	50.8±6.1	0.0013
SF-36 PCS score	40.2±12.3	53.1±6.2	0.0001
SF-36 MCS score	53.3±9.1	55.7±5.8	0.3033

Abstract 479 Table 2 Convergent validity

Outcome Measure	6MWT	p-value
MMM percent score	0.79	0.0000
Hip Flexion HHD (pounds)	0.52	0.0079
Grip strength (pounds)	0.61	0.0008
4 stair climb (s)	–0.84	0.0000
4 meter walk (s)	–0.83	0.0000
10 meter walk (s)	–0.88	0.0000
Timed up and Go test (s)	–0.87	0.0000
2 MWT (m)	0.99	0.0000
NeuroQOL upper extremity	0.26	0.2026
NeuroQOL lower extremity	0.68	0.0001
PROMIS Physical Function	0.77	0.0000
SF–36 PCS	0.62	0.0008
SF–36 MCS	0.21	0.3024

investigated its reliability and validity in OPMD.
Methods Used 26 individuals with OPMD and 20 controls completed a battery of strength, functional, and patient-reported assessments.
Summary of Results The 6MWT had test-retest reliability and correlated with manual muscle testing ($r=0.79$, $p<0.0001$) and with PROMIS physical function short form ($r=0.77$, $p<0.0001$). Mean 6MWT was lower in OPMD subjects vs. controls (387.4 ± 82.8 vs. 463.4 ± 73.2, $p=0.0023$).
Conclusions The 6MWT is a reliable and valid outcome measure in OPMD

480 CHARACTERIZATION OF NEURONS EXPRESSING DELTA AND MU OPIOID RECEPTORS IN DESCENDING PAIN CONTROL

SA Low,[1,2] G Scherrer[2]. [1]*University of Arizona, Tucson, AZ;* [2]*Stanford University, Palo Alto, CA*

10.1136/jim-d-15-00013.480

Purpose of Study Projection neurons in the rostral ventromedial medulla (RVM) modulate nociception, by regulating the incoming sensory information as it enters the spinal cord. Three populations of modulatory projecting neurons (ON, OFF, or Neutral cells) have been described in the RVM based on their firing pattern in response to painful stimuli. In the event of a painful stimulus, ON cell activity increases and OFF cell activity decreases, while Neutral cell activity does not change.

Mu and delta opioid receptors (MOR and DOR) are inhibitory GPCRs that regulate neurotransmission. MORs in descending RVM neurons have been investigated using pharmacological and electrophysiological methods. These studies have demonstrated that MOR is expressed by ON cells and inhibits action potential firing in these neurons to depress descending pain facilitation. Unlike MOR, the role of DOR in the RVM remains unclear. In this study, we used knock-in reporter mice that express DOReGFP and MORmCherry fusion proteins to reveal the location of DOR expressing neurons in the RVM and examine possible DOR and MOR co-expression.
Methods Used Fluorogold, a retrograde tracer, was stereotaxically injected into the lumbar dorsal horn of reporter mice. Mice were transcardially perfused with 4% formaldehyde solution and hindbrain was sectioned on a cryostat. Tissue was processed using fluorescent immunohistochemistry.
Summary of Results Our immunohistochemical experiments revealed that 43% of spinally projecting neurons are DOR+. Further characterization showed that 60% of DOR + cells are GABA+ while less than 1% of DOR+ cells express 5HT. Importantly, MOR and DOR expression in the RVM is overlapping with 57% of DOR+ cells coexpressing both receptors and 67% of these MOR+/DOR+ cells being Flurogold+.
Conclusions Our results suggest that DORs are predominately in inhibitory projection neurons, which may be ON cells that also express MORs. Additionally, MORs and DORs are also found in separate populations which may be inhibitory interneurons, since the populations of MOR+ and DOR+ cells that independently express each receptor are predominately Fluorogold-/GABA+. In combination with ongoing functional studies, these results will elucidate the function of DORs in RVM neurons and indicate how DOR and MOR cooperate to fine tune descending pain control.