



DEPARTMENT OF PEDIATRICS 2013 PAS ABSTRACT GUIDE

May 3, 2013

Human Growth Foundation Symposium, May 3rd, 2013-4:00-5:00 p.m.

The Renaissance Washington Hotel – Room West Salon B

"Inhaled Corticosteroids and Growth: Why the debate rages on?" David Allen, MD

May 4, 2013

****PAS Oral Presentation**

HYPOXIC AND EXERCISE VENTILATION IN ADULTS WITH A HISTORY OF PRETERM BIRTH

Melissa L Bates, Emily T Farrell, David F Pegelow, Marlowe W Eldridge

Background: In the United States, 12.8% of babies are born preterm, translating to ~500,000 live births per year.

Improvements in perinatal therapeutic care, specifically ventilatory strategies and surfactant use, have improved survival even in very low birth weight infants. However, perinatal elevations in arterial PO₂ permanently blunt the hypoxic ventilatory response (HVR) in animal models of premature birth. Whether this is true in humans is unknown.

Objective: We aimed to determine whether the HVR is impaired in adults with a history of preterm birth, both at rest and during exercise.

Design/Methods: We measured ventilation and metabolic parameters in thirteen adults with a history of preterm birth (20-22 years old, <1500 g at birth) and age-matched controls performing incremental cycle exercise to volitional exhaustion while breathing either 21% or 12% O₂. Additionally, we measured resting ventilation after five minutes of 21% O₂ and after five minutes of 12% O₂ breathing.

Results: Control and preterm populations performed equally well in exercise with 21% O₂, demonstrating no difference in peak oxygen uptake (VO₂). Both groups experienced ~25% decline in peak VO₂ with 12% O₂. Uniquely, preterm subjects demonstrated marked impairment in the resting HVR (0.14±0.27 vs 0.42±0.28 L/min/-ΔSpO₂, p=0.02). Two preterm subjects experienced hypoventilation while breathing 12% O₂ at rest. In controls, the impairment in peak VO₂ with 12% O₂ was inversely related to the resting HVR such that those with a robust HVR experienced less impairment (R²=0.42, p=0.01). This was not seen in preterm subjects.

Conclusions: Preterm and control subjects demonstrated similar exercise capacity in normoxia and hypoxia. In control but not preterm subjects, exercise performance in hypoxia was related to the ability to increase ventilation. This suggests the presence of a compensatory mechanism in preterm subjects with impaired hypoxic ventilation and, of important clinical significance, that preterm individuals may experience life-long alterations in their physiology that should be further explored.

PAS DATE/TIME/LOCATION May 4, 2013; 9:30 – 9:45 AM;
Room 145 B

****PAS Poster Presentation**

MATERNAL RISK FACTORS AND SERIAL IRON MEASURES AT BIRTH: PREDICTION OF INFANT IRON STATUS

Sharon E Blohowiak, Christopher L Coe, Pamela J Kling

Background: Development of iron deficiency (ID) in the first months of life is associated with impaired neurocognitive development. Half the iron needed for the first year's growth is acquired before birth. Infants before 1 year of life can develop ID due to maternal and infant risk factors, as well as nutritional and environmental factors. However, initial screening for iron status in the US occurs at the end of the first year.

Objective: We studied the hypothesis that measures of cord blood iron status alone or combined with maternal risk factors would predict hemoglobin (Hb) and iron status at 6-12 months.

Design/Methods: In a prospective study, we enrolled 113 healthy term newborns with ≥1 risk factors for infantile ID; lower socioeconomic status, maternal minority status, anemia, diabetes, and/or fetal growth disturbance. Maternal obesity was also reported. Serial measures of serum ferritin (biochemical index of storage iron) and zinc protoporphyrin/heme - ZnPP (index of erythrocyte iron), and Hb were measured. The lowest Hb and plasma ferritin measure postnatally at 6 or 12 months were the two study endpoints. ID cutoff for Hb was 11.6 g/dL and ferritin was 11.0 ng/mL. Positive and negative predictive values (PPV and NPV) were determined.

Results: Values for cord ferritin and cord ZnPP were correlated with their respective 6-month parameters, p<0.05. Cord ZnPP correlated with cord ferritin, p<0.05. 24% of infants had low postnatal ferritin levels and 55% of infants had low postnatal Hb levels that fell below their ID cutoff. Having any abnormal cord test of iron status had 29% PPV and 75% NPV for low postnatal ferritin. Having any abnormal cord test of iron status had 60% PPV and 46% NPV for low postnatal Hb, but adding 3 specific risk factors (large for gestation, maternal obesity, and diabetes) improved the cord test's predictive ability, to 63% PPV and 66% NPV.

Conclusions: Our healthy at-risk group of infants had 6-fold higher rate of biochemical ID and 11-fold higher rate of anemia than the rest of the population. Although postnatal factors also impact infantile ID, iron allotment at birth is important. Cord indicators of iron status, alone or in the presence of risk factors, can predict a subset of children who ultimately develop biochemical ID or anemia later in infancy. Earlier identification of these infants may lead to earlier treatment and potential prevention of adverse sequelae.
PAS DATE/TIME/LOCATION May 4, 2013; 1:00 pm– 4:00 pm;
Hall D/E (Walter E. Washington Convention Center) Board Number: 608

****PAS Poster Presentation**

COMBINED PULSE OXIMETRY AND BLOOD PRESSURE SCREENING TO DETECT CRITICAL CONGENITAL HEART DISEASE IN NEWBORNS

Kristi L Boelke, Elizabeth Goetz, John S Hokanson

Objective: Pulse oximetry screening (POx) has emerged as a tool for the detection of critical congenital heart disease (CCHD) in neonates. POx may be less effective in identifying aortic arch obstruction than other forms of CCHD. The use of blood pressure (BP) screening to detect aortic arch obstruction in neonates has not been described previously. This study was performed to assess the impact of adding BP to POx screening to detect CCHD associated with aortic arch obstruction.

Patients and Methods: POx and BP measurements were performed at 24 hours of age or prior to discharge and repeated once if abnormal. A failed screening was defined as a saturation in the foot of less than 95% or a right arm blood pressure that exceeded the leg blood pressure by 15 mmHg or more. Echocardiography was recommended in the setting of a failed BP screening and required in the setting of a failed POx screening. Charts of infants admitted at less than 30 days of age with a diagnosis of congenital heart disease were also reviewed to identify infants with a missed diagnosis of CCHD.

Results: 10,012 infants completed the screening procedure. 164 (1.6%) neonates required a repeat screening because of an abnormal initial result (139 due to abnormal BP, 13 due to abnormal POx, and 2 with abnormal POx and BP). Ultimately, 12 infants failed the BP screening, 1 infant failed both screenings, and no infant failed only the POx screening. None of the echocardiograms performed in response to screening demonstrated CCHD. No infants were identified who had been discharged home with a diagnosis of missed CCHD. The false positive rate was 0.13% for the BP and 0.01% for the POx screening components.

Discussion: In this study there were no missed cases of CCHD and no CCHD detected by POx or BP screening. Consequently, only the adverse effects of screening could be evaluated. In this population, the need for repeat screening and the final false positive rate of screening was greater for BP screening than for POx screening.

PAS DATE/TIME/LOCATION: May 4, 2013; 1:00 pm– 4:00 pm; Exhibit Hall D/E (Walter E. Washington Convention Center) Board Number 418

****PAS Poster Presentation**

DEVELOPMENT AND VALIDATION OF PRISM: A SURVEY TOOL TO IDENTIFY DIABETES SELF-MANAGEMENT BARRIERS

Elizabeth D Cox, Katie A Fritz, Kristofer W Hansen, Roger L Brown, Kaelyn E Wiles, Bryan H Fate, Henry N Young, Megan A Moreno

Background: Most children with type 1 diabetes struggle to achieve optimal glycemic control. Although several efficacious resources for improving glycemic control are available, no systematic method exists to identify and address each child and family's unique self-management barriers.

Objective: This study develops and validates PRISM (Problem Recognition in Illness Self-Management), a survey-based tool for efficiently identifying self-management barriers experienced by children or adolescents with diabetes and their parents.

Design/Methods: Adolescents 13 years and older and parents of children 8 years and older visiting for routine diabetes management (n=358) were surveyed. Drawn from existing literature, 31 items on a 5-point Likert scale (1=strongly disagree; 5=strongly agree) were used to capture experiences with self-management barriers. A1c was abstracted from the electronic health record. To develop PRISM, exploratory and confirmatory factor analyses were used to sort the 31 items into meaningful barrier domains. To assess validity, the association of PRISM barrier domain scores with A1c was examined using linear regression.

Results: Factor analyses of adolescent and parent data yielded well-fitting models of self-management barriers, reflecting the following six domains: 1) Understanding and Organizing Care, 2) Regimen Pain and Side Effects, 3) Denial of Disease and Consequences, and 4) Healthcare Team, 5) Family, or 6) Peer Interactions. All models exhibited good fit, with X2 ratios <2.21, root mean square errors of approximation <0.09, Confirmatory Fit Indices and Tucker-Lewis Indices both >0.92, and weighted root mean square residuals <1.71. Greater PRISM barrier scores as reported by adolescents and parents were significantly associated with higher A1cs.

Conclusions: Our findings suggest at least six different types of diabetes self-management barriers which are significantly related to A1c. PRISM could be used in clinical practice to identify each child and family's unique self-management barriers. This would allow existing self-management resources such as diabetes education or health psychology services to be tailored to the family's barriers, perhaps ultimately improving the effectiveness of such services.

PAS DATE/TIME/LOCATION May 4, 2013; 1:00 PM- 4:00 PM; Hall D/E (Walter E. Washington Convention Center) Board Number 300

****PAS Poster Presentation**

MAINTENANCE INTRAVENOUS FLUID IN HOSPITALIZED CHILDREN: A RANDOMIZED, DOUBLE BLIND, CONTROLLED TRIAL OF 0.9% NaCl/DEXTROSE 5% VS. 0.45% NaCl/DEXTROSE 5%

Friedman JN, Beck C, De Groot J, Geary D, Sklansky D, Freedman S

Background: Hyponatremia associated with hypotonic maintenance intravenous (IV) fluid administration is increasingly recognized as a cause of morbidity and mortality. Previous research has focused on post surgical and intensive care populations. There have been no trials examining optimal IV maintenance fluid for non-ICU, non-surgical hospitalized children.

Objective: To compare the mean serum sodium (Na) values after 48 hours of IV maintenance fluid therapy between those children given isotonic normal saline (0.9% NaCl/dextrose 5%) and those given hypotonic half normal saline (0.45% NaCl/dextrose 5%).

Design/Methods: We conducted a parallel group randomized controlled trial at a tertiary care children's hospital. Children, 1 month -18 years, with a normal baseline serum Na, who were admitted to a pediatric unit and needed IV maintenance fluids for > 48 hours were randomized to 0.9% NaCl/dextrose 5% or 0.45% NaCl/dextrose 5% at standard maintenance rates. Children with known risk factors for serum Na abnormalities were excluded. The primary outcome was mean serum Na at 48 hours, powered to detect a difference of ≥ 2.5 mmol/L between the two groups. Secondary outcomes included number of children developing clinically significant hyponatremia or hypernatremia, weight change, hypertension or edema. Randomization was computer generated. Children, parents and the research team were blinded to group assignment.

Results: 110 patients were enrolled; 54 received 0.9% NaCl/dextrose 5% and 56 received 0.45% NaCl/dextrose 5%. There were no significant differences in age, sex, weight, baseline Na or total volume of fluids received during the study. The mean serum Na at 48 hours was 139.9 ± 2.7 in the 0.9% NaCl group and 139.6 ± 2.6 mmol/L in the 0.45% NaCl group ($P=0.71$). Similarly, values at 24 hours did not differ between groups (140.5 ± 2.7 versus 139.6 ± 2.7 mmol/L respectively; $P=0.14$). The mean weight change (% increase) was 2.4 ± 4.6 and 1.1 ± 2.5 in the 0.9%NaCl and 0.45%NaCl group respectively ($P=0.23$). Two patients in each group developed hypertension and 2 patients in the 0.9%NaCl group developed edema.

Conclusions: There were no significant differences in any of the outcome measures between the groups. In the general pediatric non-ICU, non-surgical population studied both IV solutions are likely acceptable options for maintenance fluids, provided that serum Na and fluid balance are carefully monitored.

PAS DATE/TIME/LOCATION May 4, 2013; 10:00AM-11:00AM;

****PAS Poster Presentation**

ABNORMAL PANCREATIC ISLET MORPHOLOGY IN ADULT MALE OFFSPRING OF RHESUS MONKEY DAMS EXPOSED TO TESTOSTERONE EXCESS DURING GESTATION

Kimberly L Henrichs, Dawn Belt Davis, David H Abbott,

Background: Male relatives of women with polycystic ovary syndrome (PCOS) manifest symptoms of insulin resistance. Prenatally androgenized (PA) rhesus monkey females born to dams that received exogenous testosterone during gestation are an epigenetic model for PCOS. PA females show variations in pancreatic islet morphology and altered metabolic parameters, both as infants and adults. Their PA male counterparts exhibit comparable impairments in insulin action and secretion. It is not yet known, however, whether PA male monkeys exhibit comparable abnormalities in islet morphology.

Objective: This pilot study was designed to determine if adult male rhesus monkeys born to testosterone treated dams have alterations in islet morphology similar to their female counterparts. **Methods:** Pancreata from 3 PA and 3 control adult male rhesus monkeys were stained with insulin antibody and the nuclear marker DAPI. Total section area and area of each individual islet were quantified using ImageJ software.

Results: We saw fewer islets per section area in PA (3.53 ± 0.71 islets per area) compared to C (7.86 islets per area ± 1.09) males ($p<0.03$). Fractional islet area (% of total area) was similar, but individual islet size was larger ($p<0.001$) in PA males. We found a trend toward larger mean islet size in PA males ($p=0.09$). Overall, the PA males had fewer small and more large islets in a size distribution analysis. **Conclusions:** A reduction in the number of small islets with increased median islet size in PA male monkeys may reflect alterations in islet development or adaptation. These findings are similar to morphological changes seen in PA female monkeys.

Diminished islet numbers accompany diminished insulin action and secretion in female monkeys, suggesting that comparable pancreatic islet abnormalities may accompany impaired glucoregulation in both sexes. As prior studies demonstrate that serum androgens do not differ between the PA vs. C, any effect on pancreatic histology reflects altered in utero metabolism, rather than fetal testosterone exposure.

Therefore, male relatives of women with PCOS may have altered islet morphology that increases type 2 diabetes risk.

PAS DATE/TIME/LOCATION May 4, 2013; 1:00-4:00 pm; Hall D/E (Walter E. Washington Convention Center); Board Number 329

****PAS Poster Presentation**

DELAYED UMBILICAL CORD CLAMPING IN NEWBORNS WITH PRENATAL RISK FOR DEVELOPING INFANTILE IRON DEFICIENCY

Pamela J Kling, Christopher L Coe, Elyssa F Guslits, Anthony P Auger, Theresa W Guilbert, Sharon E Blohowiak

Background: Iron deficiency (ID) in infancy can show impaired metabolism and neural development. In addition to nutritional and postnatal risks, several demographic and perinatal risk factors also increase the prevalence of infantile ID, because half the iron needed to sustain infant growth is usually acquired before birth. Studies show that delayed cord clamping (DCC) at birth with regimented clamping protocols may improve infantile iron status, vs. traditional immediate clamping (ICC). However, it is unknown whether the clinical practice of DCC by waiting until pulsations cease confers a comparable advantage.

Objective: We compared iron status in infancy with clamping after pulsations cease to traditional ICC. **Design/Methods:** The IDA Study in Madison, WI was a double cohort (DCC vs. ICC) observational study of healthy term infants, with demographic and prenatal risk factors for infantile ID (maternal anemia, diabetes, minority status, lower socioeconomic status, or small- or large-for-gestational age). Subjects were enrolled after delivery and timing of cord clamping recorded. Blood was collected at birth, 6 and 12 months for hemoglobin, storage iron using plasma ferritin, and zinc protoporphyrin/heme (ZnPP/H), a measure of erythrocyte iron. Because test abnormalities at 6 months were treated, the primary endpoints were worst hemoglobin or plasma ferritin at 6 or 12 months, and secondary endpoint as worst ZnPP/H.

Results: Clamping time for ICC was <30 seconds and DCC ranged from 30 seconds -11 min, mean 3.7 minutes. Gestational age was 39.1 in ICC (n=220) ICC and 39.7 weeks in DCC (n=91) 91 DCC, $p<0.01$), with neither group experiencing postnatal complications. At 6/12 months, 25% of ICC and 9% had a ferritin <5 percentile (11 ng/mL), $p=0.07$. Group differences in demographic data were controlled for using a propensity score adjustment. At 6/12 months, lowest hemoglobin value was similar between groups, but plasma ferritin was lower in ICC vs. DCC ($p<0.04$). ICC infants were 3.2 times more likely to exhibit ZnPP/H >95th percentile at 6/12 months ($p<0.05$).

Conclusions: DCC in a translational setting improves storage and erythrocyte iron status in those at-risk for developing infantile ID. Incorporating this practice in women with demographic and perinatal risks for infantile ID should improve newborn iron allotment and long-term iron status.

DATE/TIME/LOCATION May 4, 2013; 1:00 pm– 4:00 pm; Exhibit Hall D/E (Walter E. Washington Convention Center); BOARD NUMBER: 609

****PAS Poster Presentation**

ONLINE RESOURCES FOR PEDIATRIC TYPE 1 DIABETES: WHAT KIDS WANT

Allison J Pollock, Megan A Moreno, M. Tracy Bekx, Ellen L Connor

Background: Over 13,000 youth are diagnosed with type 1 diabetes annually. Diabetes control is often inadequate as adolescents begin to assume their own diabetes care. Online and mobile technology could provide new avenues for young people to gain diabetes education and support.

Objective: The purpose of this study is to evaluate how adolescent patients with type 1 diabetes use online resources to understand and manage diabetes.

Design/Methods: We surveyed patients from outpatient diabetes clinics. Study inclusion criteria were diagnosis of type 1 diabetes, ages 11 through 19 years, and English language. The survey was given online via exam room computers. It contained 35 items that assessed (1) Internet use, (2) perceived utility of diabetes resources and (3) responses to 10 common scenarios. Analyses included Kruskal-Wallis test, Wilcoxon rank sum test, ANCOVA and Chi-square test.

Results: 59 subjects (54% female) completed the survey (response rate=88%); mean age was 14.4 yrs (SD=2.26). When going online to answer diabetes related questions, subjects indicated they accessed the Internet most frequently from "Home" (81%) than all other responses ($p<0.0001$). When asked, "How useful is the Internet in helping you understand type 1 diabetes," 33% of the responders indicated the Internet was useful compared to 28% who did not find it useful. Subjects' responses to common diabetes scenarios included "Go online," "Contact provider" and "Other." When prompted with an emergent situation, "I just had a seizure from hypoglycemia. Where can I get more glucagon?," significantly more subjects indicated "Contact provider" (71%) than all other responses ($p<0.0001$); few subjects indicated "Go online" (5%). When prompted with a sensitive situation, "What should I know about alcohol and drugs related to diabetes?," significantly more subjects indicated "Go online" (67%) than "Contact provider" (33%) ($p=0.027$).

Conclusions: Many adolescents already use Internet resources to improve their diabetes knowledge. In dealing with sensitive topics, many young people go online rather than speaking with a provider. While providers should be the primary resource for emergent patient questions, the availability of online diabetes resources can be a valuable source of diabetes knowledge for young people. Diabetes providers should be familiar with technology that gives patients accurate diabetes information and should be able to make appropriate website and mobile resource recommendations for their patients.

PAS DATE/TIME/LOCATION: May 4, 2013; 1:00 PM - 4:00 PM; Exhibit Hall D/E, Board Number 294

May 5, 2013

APA Membership Meeting and Debate 2013

Resolved: *The Electronic Medical Record Improves Pediatric Patient Care and Resident Education*

Moderator: Jane Knapp, Chair Graduate Medical Education, Children's Mercy Hospitals and Clinics, Associate Dean, University of Missouri-Kansas City School of Medicine

Pro the Resolution:

Carol D. Berkowitz, Executive Vice Chair, Department of Pediatrics, Harbor-UCLA Medical Center, Professor of Clinical Pediatrics, David Geffen School of Medicine at UCLA

Joseph Zorc, Associate Professor of Pediatrics, Perelman School of Medicine, University of Pennsylvania, Director, Emergency Information Systems, The Children's Hospital of Philadelphia

Con the Resolution:

John Frohna, Program Director and Vice Chair for Education, Department of Pediatrics, Professor of Pediatrics and Medicine, University of Wisconsin School of Medicine and Public Health

Kenneth Roberts, Professor Emeritus of Pediatrics, University of North Carolina

Sunday, May 5, 2013; 3:45pm–6:00pm; 5:00 **DEBATE**; Washington Convention Center, Ballroom A

****PAS Poster Symposium**

TRENDS IN TOBACCO AND MARIJUANA USE AMONG COLLEGE FRESHMEN

Kelly Bush, Lauren Kacvinsky, Megan Moreno

Background: Tobacco has often been considered a 'gateway' drug to subsequent marijuana use. Few studies have examined the trajectory of tobacco and marijuana use as adolescents enter college. **Objective:** The purpose of this longitudinal study was to evaluate patterns of tobacco use and their association with subsequent marijuana use among college students during their freshman year.

Design/Methods: Incoming college students from two universities (one on the West Coast and the other in the Midwest) were randomly selected from university registrar lists for recruitment. Participants completed phone interviews before entering college (Time 1) and one year later (Time 2). Interviews assessed tobacco and marijuana use, including lifetime and current (past 28 day) use. The Timeline FollowBack tool was used to assess quantity and frequency of use in the past 28 days and written notes were used to record participant answers. Analysis included Wilcoxon sign rank tests and logistic regression.

Results: Of 338 participants, 315 completed both interviews (93.1% retention rate). Overall, 56% were female, 75% were Caucasian and 59% were from the Midwestern university. At Time 1, 104 (33%) participants reported lifetime tobacco use and 43% of these reported current use. Tobacco users were more likely to report lifetime marijuana use than tobacco non-users (OR 23.3, 95% CI: 11.9-45.7). Of current tobacco users, 53% reported current use of both tobacco and marijuana. Average tobacco episodes per month were similar among users of tobacco only and concurrent users of tobacco and marijuana (5.6 to 7.5). By Time 2, 66% of participants who reported current tobacco use at Time 1 remained current users with an average of 33.6 tobacco episodes per month. Of these, 53% reported concurrent marijuana use. Overall, concurrent users of both substances at Time 2 averaged significantly more tobacco episodes per month than current users of tobacco only (41.9 vs. 24.1, $p=0.02$). While the frequency of tobacco use increased by Time 2 among current users (5.6 to 33.6, $p=0.00$), the frequency of marijuana use among concurrent users remained similar (13.1 to 16.8).

Conclusions: Individuals who are current users of tobacco products before entering college are more likely to also smoke marijuana. By time 2, students who use both substances report higher frequency of smoking tobacco than students who use tobacco alone. Future work should involve designing educational campaigns highlighting the increased risks of using these substances together.

***Winner of the Region VI Trainee Travel Award

PAS DATE/TIME/LOCATION Session 2195 – Risky Behaviors and High Risk Populations May 5, 2013; 8:00-10:00 AM; Washington Convention Center; Room 145B

****PAS Poster Presentation**

EMOTIONALLY CHARGED SITUATIONS IN PEDIATRIC RESIDENCY: USING MIXED METHODS TO IDENTIFY PREVALENCE AND COMMON THEMES TOWARDS PROGRAM DEVELOPMENT

Andrea Carberry, Mary Ehlenbach, Cathy Lee-Miller, Megan Moreno

Background: Pediatric residency can be psychologically challenging, especially when emotionally charged situations with patients and families occur. Currently, few formalized programs support the psychological well being of residents who experience these situations. This study used surveys and focus groups to globally explore emotionally charged situations during pediatric residency and identify areas for program development.

Design/Methods: Pediatric residents completed surveys assessing the frequency and types of emotionally charged situations they encountered and current supportive measures they used to cope. Focus groups were conducted with select faculty and residents to discuss survey results and develop a formal program to provide support to affected residents. Written notes were taken during focus groups. Analysis included descriptive statistics for surveys and thematic analysis using an iterative process for focus groups.

Results: Of 25 residents surveyed, 20 (80%) endorsed experiencing at least one adverse patient related event. The most common events were unanticipated morbidity, mortality or making a medical error. Twenty-four residents (96%) reported they had been involved in at least one patient or family interaction that left them negatively affected. The most common were interacting with an angry patient or parent or delivering life-altering information. Only 14 residents (56%) reported they had discussed these events with faculty. All surveyed residents reported a desire to discuss such events with faculty. Focus groups identified three themes regarding these events: all involved grief, anger, or doubt. Grief included both the experience after the death or serious decline of a patient OR witnessing the grief of a patient or family member. Anger included interacting with an angry patient or parent AND anger experienced in any work-related situation. Doubt referred to anxiety experienced by residents when learning autonomous patient management.

Conclusions: Emotionally charged situations are encountered frequently during pediatric residency and a lack of structured faculty support was identified. Next steps include development of a faculty support system with a core group of faculty available to address resident needs. Faculty with experience addressing grief, anger or doubt will be recruited for this capacity.

PAS DATE/TIME/LOCATION May 5, 2013; 4:30-7:30pm; Exhibit Hall D/E Walter E. Washington Convention Center; Poster Number: 758

****PAS Poster Presentation**

PARENT SAFETY BEHAVIORS AND NEED TO WATCH OVER INPATIENT CARE

Elizabeth D Cox, Pascale Carayon, Kristofer W Hansen, Victoria P Rajamanickam, Roger L Brown, Lori L DuBenske, Linda A Buel

Background: Experts recommend families as partners in ensuring safe care for hospitalized children. Although many parents perceive a need to watch over their child's inpatient care to ensure mistakes aren't made, whether this need translates into their performance of recommended behaviors to reduce medication errors and hospital-acquired infections is unknown.

Objective: We sought to understand how parental need to watch over care is related to their performance of recommended safety behaviors.

Design/Methods: At the child's admission, 172 parents were surveyed about their need to watch over care (single item; 1=agree or strongly agree, 0=neutral or disagree), demographics, and hospitalization factors. At discharge, parents were surveyed about 3 medication safety behaviors (asking providers to name the drug or dose, to read aloud medication labels, or to check drug or infusion accuracy) and 3 hand hygiene behaviors (asking providers to clean hands, likelihood of reminding providers to clean hands when they did not, and comfort reminding providers about this). Logistic regression was used to relate parent need to watch over care to the behaviors, adjusting for demographics and hospitalization factors.

Results: Most parents (77%) reported frequently or very frequently asking healthcare providers for the drug name or dose, while fewer asked a provider to read aloud medication labels (21%) or to check drug or infusion accuracy (29%). Although only 3% of parents asked a provider to clean hands, most were comfortable asking (82%) and were likely to speak up when a provider did not (78%). Needing to watch over care was reported by 38% of parents. In adjusted models, parental need to watch over care was significantly positively related to asking providers for the drug name or dose (odds ratio=2.36, 95% confidence interval 1.02-5.44) and to check drug or infusion accuracy (3.52, 1.74-7.12). Need to watch over care was not significantly related to the other safety behaviors.

Conclusions: Parents who need to watch over care are more likely to engage in specific behaviors around safe medication use, compared to those not perceiving this need. Even among parents who need to watch over care, many do not perform recommended safety behaviors, especially regarding hand hygiene. Improving understanding of parent motivations for performing safety behaviors could help to engage parents as partners in promoting patient safety.

PAS DATE/TIME/LOCATION May 5, 2013; 4:15 PM– 7:30 PM; Exhibit Hall D/E Walter E. Washington Convention Center; Board Number 626

****PAS Oral Presentation**

OLDER ADOLESCENTS, COLLEGIATE DRINKING, AND INFLUENCE ON FACEBOOK

Jonathan D D'Angelo, Megan A Moreno

Background: Facebook is often used by older adolescents to investigate new college friends. Alcohol displays are frequent on college student profiles and occur in many formats. Little is known about the influence of these displays.

Objective: This study investigated whether viewing different types of multimedia information (cues) on Facebook, such as wall posts, pictures or status updates, were more likely to positively influence adolescent drinking.

Design/Methods: Registrar lists from two large universities were used to randomly select potential participants for recruitment. Eligible participants were between the ages of 17 and 19. Phone interviews were conducted the summer prior to college enrollment. Vignettes were used to assess the influence of Facebook cues on intention to use alcohol. Vignettes are a validated method for assessing participant perceptions through presentation of specific situations. This vignette presented a scenario in which a senior college student's Facebook profile displayed wall-posts, pictures, and status updates that were drinking related ("I'm planning to get totally wasted tonight") or prosocial in nature ("Can't wait to run another marathon"). Participants were asked to report the likelihood (0-6, 0 = not likely) of drinking with that student if together at a party. Analyses included testing for linear trend and planned contrasts.

Results: 315 participants (56% female, 75% Caucasian, 59% University A) completed the phone interview. Results confirmed the hypothesis that a general linear trend existed $F(1,2343) = 71.1 = p < .0001$, such that prosocial wall posts ($M = 2.1$) were most likely to influence drinking intention, followed by prosocial pictures ($M = 2.1$), prosocial status updates ($M = 1.9$), drinking status updates ($M = 1.5$), drinking pictures ($M = 1.4$), / and drinking wall-posts ($M = 1.3$). Wall-posts as a whole were more influential than pictures in impression formation $F(1,666) = 3.6$, $p < .05$, and pictures were more influential than status updates, $F(1,666) = 3.9$, $p < .05$.

Conclusions: Adolescents entering college report increased likelihood to drink with those whose Facebook profiles display prosocial interests, compared to those who display drinking information. Further, individuals rely more on other-generated cues such as wall posts to assess individuals via their Facebook profile. Future work could utilize these patterns of impression formation towards designing online interventions.

PAS DATE/TIME/LOCATION May 5, 2013; 3:30 pm–5:30 pm; 151A (Walter E. Washington Convention Center)

****PAS Oral Presentation**

CARDIOPULMONARY RESUSCITATION CERTIFICATION IN HIGH SCHOOL COACHES: A SURVEY OF WISCONSIN HIGH SCHOOL ATHLETIC DIRECTORS

Matthew W Harer, Jeffrey P Yaeger

Background: Cardiopulmonary Resuscitation (CPR) has been shown to increase survival in instances of sudden cardiac arrest (SCA). With an incidence of 3.75/100,000 in children aged 14-24 and a survival rate of only 11%, SCA is a devastating event. Data show that US high school coaches are the first responders to SCA in one-third of high school athlete collapses, but very little is known about these coaches' CPR certification status.

Objective: The primary objective of this study was to assess the prevalence of CPR certification in Wisconsin high school coaches.

Design/Methods: This study was a web-based survey of Wisconsin high school athletic directors. A sixteen-question multiple-choice survey was created, piloted, and developed into an online survey. An email database from the Wisconsin Interscholastic Athletic Association was obtained and the web-survey was distributed to 503 athletic directors. Responses were tabulated through the UW Qualtrics survey website.

Results: There were a total of 240 survey responses, a 48% response rate, reporting that Wisconsin coaches are the primary responders to the majority of collapses (78%). Overall, 75% of survey respondents have an emergency action plan (EAP). Athletic directors with the longest tenure, greater than 12 years, were the most likely to have an EAP in place at their school ($p < 0.007$). The majority of Wisconsin high schools (64%) do not require CPR certification of coaches. In fact, only 50% of all coaches are currently CPR certified. When given the choice, 86% of athletic directors either agree or strongly agree that coaches should be CPR certified. Schools with a previous collapse were more likely to require CPR certification ($p = 0.11$). Comparing schools that had a previous collapse against those that did not, 81% vs. 73% had an EAP ($p = 0.16$).

Conclusions: In Wisconsin, the proportion of coaches who act as the primary responder to a collapse is greater than previously reported. Although EAPs are present in 75% of schools, two-thirds of schools lack any CPR requirements for coaches. The discrepancy between the number of CPR-certified coaches and number of coaches who serve as primary responders is neither safe nor adequate due to the severe consequences of SCA. Pediatricians should advocate for schools to develop EAPs and mandate CPR certification for coaches as two important steps to protect the safety of high school athletes.

PAS DATE/TIME/LOCATION May 5, 2013; 1:00 - 3:00 PM; Room 147A, Walter E. Washington Convention Center, Presentation Time: 2:45 PM

****PAS Poster Presentation**

TLR4 SNPS D299G AND T399I DO NOT CORRELATE WITH EARLY GESTATIONAL AGE IN A POPULATION OF WISCONSIN INFANTS

De-Ann M Pillers, Mei Baker, Steven J Schrodi, Jessica A DeValk, Lydiah J Zyduck, Steven Lund, Bikash R Pattnaik Sara A Tokarz

Background: Toll-like receptors (TLRs) are present in many cell types and serve as the first point of defense in the innate immune system by initiating the inflammatory cascade in response to infection. Single nucleotide polymorphisms (SNPs) are present in many TLR genes and have been associated with many disorders of inflammation. TLR4 D299G and T399I SNPs are associated with increased susceptibility to infection from various pathogens. As inflammation can play a role in the development of preterm labor, TLR SNPs that alter the response to infection may have a different frequency in the preterm population. To this end, we screened a population for a subset of TLR4 SNPs to determine their genotype frequencies in relation to gestational age.

Objective: Screen a large, diverse population of Wisconsin newborns for TLR4 D299G and T399I SNPs and determine the genotype frequency in relation to gestational age.

Design/Methods: Anonymized DNA samples from 2451 infants were obtained in collaboration with the Wisconsin State Laboratory of Hygiene. TLR SNP assays (rs4986790, rs4986791) were purchased from Applied Biosystems Inc (ABI) and run on the ABI StepOnePlus™. Data were analyzed using StepOne™ software v2.2.2. Statistical analysis was carried out in collaboration with the Marshfield Clinic and the National Institute of Standards and Technology.

Results: Our analysis revealed significant differences between genotype frequencies among races, as expected. In addition, the TLR4 SNPs D299G and T399I were in moderate to high linkage disequilibrium. However, we did not find a significant correlation between the 299G and 399I alleles and early gestational age. When adjusting for racial background, we found that among African Americans the 399I allele showed a minor association with later gestational age.

Conclusions: We show that in a population of 2451 Wisconsin infants the TLR4 SNPs D299G and T399I genotype frequencies varied among racial backgrounds and were in linkage disequilibrium. These data are in agreement with current population data. Importantly, our findings are not consistent with current literature that shows a correlation between the TLR4 SNP 299G and 399I alleles and early gestational age. We did find that 399I may exert a small protective effect against preterm birth in African Americans, however further analysis needs to be performed.

PAS DATE/TIME/LOCATION May 5, 2013; 4:15-7:30pm; Hall D/E (Walter E. Washington Convention Center) Board Number 353

****PAS Workshop**

GLOBAL HEALTH AND MEDICAL SIMULATION: HOW TO IMPLEMENT A RESIDENT-LED SIMULATION CURRICULUM IN RESOURCE-LIMITED COUNTRIES

Michael B Pitt, Walter Eppich, Sabrina M Butteris, Molly Shane

Maintaining a meaningful relationship with a global health partner institution can be challenging. Providing sustained and impactful projects that visiting clinicians, particularly trainees, can implement promotes these essential relationships. We have found that healthcare simulation, a modality that is becoming increasingly present in residency program education, can be adapted to fill these needs. Using simple to follow one-sheet guides and an inflatable mannequin to deliver a targeted curriculum, we developed a model for an inexpensive yet effective use of simulation in resource-limited countries. Since 2010, we have trained residents to lead these sessions for Tanzanian medical students while abroad, doing so for over 300 learners. We provide an overview of our curriculum development and implementation, with an emphasis on how to overcome common obstacles when utilizing simulation in low-resource settings.

PAS DATE/TIME LOCATION May 5, 2013; 8:00-11:00 AM; Room 209C

****PAS Poster Symposium Session – Obesity II: Clinical and Pathologic Correlations**

QUANTITATIVE MRI-NOT ALT-ALLOWS FOR EARLY DIAGNOSIS OF HEPATIC STEATOSIS

Jennifer Rehm, Peter Wolfgram, Ellen Connor, Vanessa Curtis, Wei Zha, Scott Reeder, David Allen, MD

Background: The prevalence of non-alcoholic fatty liver disease (NAFLD) ranges from 28% to 38% in overweight children. NAFLD is anticipated to be the leading cause of liver cirrhosis, failure, and transplant in the future. Early identification of NAFLD, currently based on ALT, is important for prevention and intervention.

Objective: To compare quantitative MRI to ALT for early diagnosis of NAFLD and associated metabolic disease.

Methods: Cross-sectional study of 131 females aged 11 to 21 years (mean 13.30±2.01), 64% Caucasian, 31% African American & 5% Asian (27% Hispanic, 73% Non-Hispanic). Fifty-five percent of subjects were overweight or obese (BMI >85%). Fasting glucose, insulin, ALT, BMI, & waist circumference (WC) were measured. Hepatic fat was quantified using MRI proton density hepatic fat fraction (HFF). Hepatic steatosis (HS) was defined as HFF >5.6%.

Results: Tables show metabolic markers in all subjects and in overweight subjects with/without HS. Overall mean ALT was 24±13 and was normal (≤40U/L) in 93% of all subjects and 70% of HS (see Figure 1). HS was found in 25% of overweight subjects and 1 subject with a BMI <85%. [figure1]

Discussion: Quantitative MRI allows early identification of HS and correlates with insulin resistance. In contrast, elevated BMI and ALT were not predictive of HS in the overweight girls. The strong correlation of ALT with HFF in HS subjects suggests hepatocellular injury. However, 14 HS subjects had an ALT ≤40U/L and would be missed by current ALT based screening. Using an ALT of ≤16U/L rules out most HS but decreases specificity. An algorithmic approach incorporating HFF would greatly enhance early diagnosis of NAFLD, allowing for early prevention and intervention.

Acknowledgements: NIH (RC1 EB010384, R01 DK083380, R01 DK088925, R01 DK096169, & T32 DK077586-01), Wisconsin Alumni Research Foundation Accelerator Program, Genentech Center for Clinical Research, Endocrine Fellows Foundation, and Pediatric Endocrine Society. We thank GE Healthcare for their support.

PAS DATE/TIME/LOCATION May 5, 2013; 10:30 am– 12:30 pm;
ROOM: 146A (Walter E. Washington Convention Center);
BOARD NUMBER: 4

****PAS Poster Presentation**

HYPEROXIA INDUCES ALTERATION OF INFLAMMATORY PATHWAY GENE EXPRESSION IN HUMAN LUNG EPITHELIAL CELLS (A549)

Sara A Tokarz, Wenxiang Luo, Ryan M Spott, Bikash R Pattnaik, De-Ann M Pillers

Background: Progress in neonatal respiratory care of the preterm infant has led to substantial reduction in the classical form of Bronchopulmonary Displasia (BPD) first described 40 years ago. Due to the improved survival rate among extremely premature infants, a “new BPD” has emerged in which the development of the very premature lung is disrupted. Thus, BPD continues to be a major chronic respiratory disorder that causes morbidity and mortality in preterm neonates. Hyperoxic toxicity impacts neonatal lung development, in part by activating inflammatory pathways in epithelial cells, which give rise to alveoli. However, the exact effect that hyperoxia has on the developing neonatal lung and consequently, the development of BPD, has not been well defined.

Objective: Expose a human type II lung epithelial cell line (A549) to hyperoxic conditions to elucidate changes in the expression of inflammatory genes.

Design/Methods: A549 cells were grown in normoxic (21% O₂) or hyperoxic (95% O₂) conditions for 24 hrs and then RNA was isolated. A Human Common Cytokine PCR Array (SABiosciences) was used to measure the changes in gene expression between normoxic and hyperoxic conditions. Experiments were performed in triplicate. Data analysis was performed on StepOnePlus Software v2.2. The Student's t-test was applied. Changes greater than 1.5-fold with a p-value \leq 0.05 were considered significant.

Results: Hyperoxic treatment resulted in at least a 1.5-fold change in the expression of 23 genes that belong to different functional categories. Interleukins (IL)1B, IL6, IL8, and IL12A were up-regulated whereas IL2, IL9, IL12B, and IL16 were down-regulated. Within the TNF superfamily, hyperoxic treatment increased expression of LTB, TNF, TNFSF8, TNFSF10, and TNFSF12. In the TGF family, the expression of INHA, INHBA, and TGFA was increased, but LEFTY2 and GDF10 were reduced. In addition, hyperoxic treatment also increased CSF1, CSF2, and PDGFA, but decreased IFNB1.

Conclusions: Our findings suggest that lung epithelial cells may play an important role in hyperoxia-related BPD via the production of inflammatory mediators. These genes may play a role in regulating critical aspects of lung development that may contribute to BPD, including leukocyte infiltration, disruption of alveolar epithelial and capillary cell function, proliferation of fibroblasts contributing to lung fibrosis, and smooth muscle proliferation leading to hyperplasia. /

PAS DATE/TIME/LOCATION May 5, 2013; 4:15-7:30pm; Hall D/E (Walter E. Washington Convention Center) Board Number 264

****PAS Poster Presentation**

NORMAL BLOOD PRESSURE IN HEALTHY NEONATES

Natalie O White, Kristi Boelke, John Hokanson, Jens Eickhoff

Background: Despite being one of the vital signs, normative data for systolic and diastolic blood pressure (BP) in healthy neonates is not well defined.

Objective: Our primary objective was to determine the effects of gender, birth weight, gestational age, and measurement site (right arm vs. leg) on BP values.

Design/Methods: We retrospectively reviewed 10,054 paired BP measurements from the right arm and one leg in healthy neonates from the normal newborn nursery at a tertiary care hospital. Gestational age ranged from 35-42 weeks (mean 39 weeks, SD=1.3), and participants were 49% female. BP measurements were obtained using an oscillometric device at greater than 24 hours of life. Nursery policy recommended echocardiography for any baby in which the right arm systolic BP exceeded the leg systolic BP by 15 mmHg or more on repeat measurements.

Results: Based on univariate and multivariate regression analysis, gestational age and birth weight were independent predictors for both systolic and diastolic BP, but gestational age was a stronger predictor than birth weight. There was no statistically significant gender effect detected. Right arm systolic and diastolic BP readings were an average of 1.6 (\pm 8.5) mmHg ($p < 0.001$) and 1.0 (± 10.0) mmHg ($p < 0.001$) higher than the paired leg pressures, respectively. In 189 neonates (2.1%) the right arm systolic pressure exceeded the leg systolic pressure by at least 15 mmHg on the first measurement, but no babies were found to have a coarctation of the aorta.

Conclusions: Normal BP in newborns at 24 hours of life is determined in part by gestational age and birth weight, but not gender. Interestingly, in healthy neonates leg BP did not overestimate right arm BP as seen in older children. Even in the absence of a coarctation, right arm BP was occasionally much higher than leg BP. This data is clinically relevant as it provides us with normative BP data and could change how we manage and interpret BP in the normal newborn nursery. *PAS DATE/TIME/LOCATION* May 5, 2013; 4:15 PM- 7:30 PM; Exhibit Hall D/E, Walter E. Washington Convention Center, Board Number 431

****PAS Poster Symposium Session – Obesity II: Clinical and Pathologic Correlations**

NON-OBESE GIRLS EXHIBIT DIFFERING METABOLIC EFFECTS OF ECTOPIC FAT BASED ON RACE AND ETHNICITY

Peter M Wolfgram, Ellen L Connor, Jennifer L Rehm, Wei Zha, Jens C Eickhoff, Scott B Reeder, David B Allen

Background: Among obese subjects, racial and ethnic differences exist in adipose tissue deposition and its effect on insulin resistance (IR) severity. Whether such differences are present in non-obese children is unknown.

Objective: Assess IR, ectopic fat (hepatic fat fraction [HFF] and visceral abdominal adipose tissue [VAT]), and subcutaneous abdominal adipose tissue (SCAT) in non-obese African-American (AA), Hispanic (H) and non-Hispanic (NH) White girls.

Design/Methods: Cross-sectional study of HFF (n=57; with characteristics in Table 1) and VAT/SCAT (n=30; 10 AA, 10 H, 10 NH) in non-obese girls. BMI, waist circumference (WC), fasting insulin (FI) and glucose, sex hormone binding globulin (SHBG), estradiol, and HOMA-IR were obtained. 3T MRI measured HFF, VAT, and SCAT by quantitative proton-density fat method. VAT and SCAT were assessed at L4.

Results: HFF correlated strongly with FI, HOMA-IR, adiponectin, and SHBG in H, but not in AA and NH girls (Table 2). At HFF just above the normal range (>2%), H girls have higher FI than either AA (p<0.05) or NH (p<0.01) girls. VAT correlated with FI and HOMA-IR only in H subjects; however, both H and AA girls had significantly higher FI and HOMA-IR than NH (all p≤0.02) when adjusted for VAT. Among all subjects, WC correlated significantly with HFF(r=0.38), SCAT (r=0.86), FI (r=0.50), HOMA-IR(r=0.5), SHBG(r=-0.57), and adiponectin(r=-0.45), and in each case the correlations were stronger than those of BMI-Z to the same studies.

Conclusions: Non-obese girls show metabolic effects of site-specific fat deposition that vary by race/ethnicity. Hepatic fat, and to a lesser extent VAT, affects indicators of IR earlier in H non-obese girls. In non-obese AA and H girls, VAT affects IR indicators more than NH girls. In general, WC appears superior to BMI in predicting HFF and other measures of evolving IR in non-obese girls.

PAS DATE/TIME/LOCATION May 5, 2013; 10:30 am– 12:30 pm; 146A (Walter E. Washington Convention Center)

May 6, 2013

***PAS Symposium**

PEDIATRIC GROWTH HORMONE TREATMENT: ENTERING A NEW ERA – SAFETY OF hGH: THE UNFINISHED TASK AHEAD

David B Allen

3:30 PM – 5:30 PM (4:10 pm – 4:50 pm) Washington

Convention Center, Room 202 B

Symposium

DEVELOPMENTAL-BEHAVIORAL PEDIATRICS APA SPECIAL INTEREST GROUP – SCREENING AND EVALUATION OF NEUROMOTOR DISORDERS

Michelle M Macias, Paul H Lipkin, Dipesh Navsaria

Children with neuromotor conditions such as Duchenne's muscular dystrophy and cerebral palsy are often diagnosed at relatively late ages, resulting in delays in treatment, despite the fact that these conditions can be identified earlier. While developmental screening at specific ages is recommended in Bright Futures, it is not universally implemented. Additionally, when motor concerns are seen, pediatricians commonly report feeling uncomfortable performing the neuromotor examination and uncertain about further evaluation and referral of children. There is also a lack of clarity about when to safely recommend watchful waiting versus immediate referral. In order to address this, a joint American Academy of Pediatrics (AAP)/Centers for Disease Control and Prevention (CDC) Neuromotor Screening Initiative was developed. This interactive workshop is designed to increase education and provide specific guidance regarding neuromotor examination, surveillance, and screening. A focus will be on providing educators with the tools and resources they need to ensure the future pediatric workforce has the skills and competencies necessary to adequately identify and care for children with neuromotor conditions. Education and guidance will be provided based on a new AAP clinical report and algorithm to be published prior to the conference. The presenters will include Dipesh Navsaria, Michelle Macias and Paul Lipkin. This year's SIG will be hosted by new chair Diane Langkamp.

Monday, May 6, 2013; 8:30 AM – 11:30 AM; Washington Convention Center Room 149 A

***PAS Oral Presentation**

**A NOVEL PARTNERSHIP & APPROACH TO STRENGTHEN
PEDIATRIC EMERGENCY CARE IN ETHIOPIA**

Sabrina M Butteris, Tigist B Heye, Muluwork T Dinerbu, Scott A Hagen, Joshua Ross, Getachew Teshome, James E Svenson, Peter M Rankin, Girma Tefera

Background: As the second most populous country in sub-Saharan Africa, the need for health care services in Ethiopia is substantial. With 46% of the over 90 million people in Ethiopia accounted for by children, the need for pediatric emergency care is immense. This need is exacerbated by population growth & urbanization, inadequate sanitation, infrastructure challenges, limited preventative care and high rates of road traffic accidents. Despite the substantial need, there is minimal infrastructure to support pediatric emergency care in Ethiopia.

Objective: In 2010, a partnership to strengthen pediatric emergency care in Ethiopia was formed between two tertiary care academic institutions, an Ethiopian diaspora organization, and a US-based non-profit organization. The goal of the partnership was to enhance and strengthen pediatric emergency care by building institutional and human resource capacity.

Design/Methods: Partnership activities have included work planning meetings, bidirectional exchange of pediatric faculty & nurses, the development of a competency-based pediatric emergency medicine fellowship training program, quality improvement (QI) & leadership training, implementation of QI projects and short-courses in pediatric emergency care.

Results: Four nurses and 2 pediatricians from Ethiopia have participated in the exchange program. The physician retention rate has been 100% and nurse retention 75%. Within the first year, the need for increased training in pediatric critical care was identified & then augmented in the curriculum. The first cohort of pediatric emergency medicine physicians in Ethiopia graduated in October 2012. Short courses have been taught to 543 learners utilizing the train-the-trainer model with participation from multiple regions in Ethiopia.

Conclusions: A cornerstone of the partnership has been the pediatric emergency medicine fellowship program for Ethiopian pediatricians. Given the local context, the fellowship blends the skillsets of emergency medicine & critical care with a focus on leadership and quality improvement. This model has been effective in this environment and may warrant translating to similar environments. An additional unique aspect of the partnership that warrants particular attention is the role of the Ethiopian diaspora community, a perhaps underutilized resource in conventional global health partnerships.

PAS DATE/TIME/LOCATION May 6, 2013, 1:30 PM Washington Convention Center Room 146C

****PAS Poster Presentation**

**REGULATION OF RETINAL VASCULARIZATION BY
OXYTOCINERGIC SIGNALING**

P Halbach, W Luo, DM Pillers, BR Pattnaik

Background: Retinopathy of prematurity (ROP) is primarily a developmental anomaly, caused by a perturbation in retinal vascularization. ROP occurs in infants born at less than 29 weeks gestation and is associated with abnormal expression of vascular endothelial growth factor (VEGF); however, the precise mechanisms that lead to ROP remain unclear. Oxytocin (OXT) is a neuropeptide hormone produced in the hypothalamus. Between 32 weeks of gestation and term, the production of OXT in the fetal hypothalamus increases substantially. Interestingly, oxytocinergic signaling has been implicated in angiogenesis, but its regulation of retinal vascularization remains unexplored.

Objective: To investigate oxytocinergic signaling in the retina, and determine whether it plays a role in retinal neovascularization.

Design/Methods: In human and monkey eye tissue, the mRNA for the oxytocin receptor (OXTR) was detected using RT-PCR. Both OXTR and OXT protein expression were determined by standard immunohistochemistry using human and monkey frozen retinal tissue sections. Cultured human fetal RPE (hrPE) cells were grown to a monolayer and maintained at 37°C and 5% CO₂ with a media change every 2 days. hrPE cells treated for 12 hours with 0.1µM, 1µM, and 10µM OXT were evaluated for VEGF and PEDF transcript expression using RT-PCR.

Results: OXTR transcript was expressed in the retina, RPE, and rectus muscle of the human and monkey eye. OXTR protein, however, was only detected in the RPE. OXT was heavily concentrated in the cone photoreceptor outer segments in close proximity to the RPE. hrPE cells treated with 1µM and 10µM OXT exhibited an increase in VEGF transcript, 1.4 and 1.5-fold (p<0.05), respectively, relative to the control.

Conclusions: This study describes the specific localization of the oxytocin receptor to the RPE and oxytocin to the cone photoreceptors of the eye. Oxytocin's up-regulation of VEGF suggests oxytocin plays a role in retinal vascularization.

Therefore, individuals born less than 32 weeks gestation may experience unregulated VEGF expression related to oxytocin-deprivation, which contributes to the abnormal neovascularization found in patients with ROP.

PAS DATE/TIME/LOCATION May 6, 2013; 4:15 PM-7:30 PM; Hall D/E, Board Number 730

****PAS Poster Presentation**

SEX-SPECIFIC EFFECTS OF HYPERGLYCEMIA DURING PREGNANCY ON OFFSPRING KIDNEY DEVELOPMENT AND RENAL HISTOLOGY

Rebecca S Lundberg, Jeffrey L Segar, Thomas D Scholz, Pamela J Kling

Background: Offspring of diabetic mothers (ODM), especially males, are at risk for adult hypertension, due to changes in postnatal physiology and metabolism. The mechanistic links for this association are unknown, but may be related to aberrant renal structural and functional development. Our group found that 7 month old male ODM were hypertensive compared to male control or female ODM, with some impairment in nitric oxide (NO) signaling found.

Objective: To further these findings, we studied whether the sex-specific differences in hypertension in ODM is associated with developmental alterations in microscopic kidney architecture.

Design/Methods: Pregnant Sprague-Dawley rats were injected with 50 mg/kg streptozotocin (STZ) to generate diabetes mellitus at gestational day 13. Twice-daily SQ insulin maintained blood glucose levels between 150-400 mg/dL. At birth all pups were cross-fostered to non-diabetic dams. Kidneys were harvested, weighed, fixed and sectioned at P1, P21 and 7 months of age. Glomerular generations, glomerular planar surface area/area of cortex (GPSA), glomerular size, and glomerular density were determined from morphometric techniques. Identification of macula densa (MD) and point counting of its nuclei were performed using immunohistochemistry for the enzyme nNOS, which is specific for MD cells.

Results: Male ODM kidney weight/body weight was less than male controls, $P < 0.05$, but higher than both control and ODM females, whose ratios did not differ. At P1 and P21, glomerular and MD appearance did not differ between sex or ODM/control groups. At 7 months, glomerular generations and GPSA did not differ between sex or ODM/control groups. Glomerular size was larger and density less in males vs. females ($P < 0.0001$), but ODM vs. control did not differ within the sexes. At 7 months, mean cell #/MD was lower in female ODM than all other groups, $P < 0.05$.

Conclusions: Although decreased nephron allotment is associated with hypertension, no appreciable differences were found between males with ODM vs. control. Sex differences in kidney weight and MD appearance were seen in ODM. MD cells are specialized distal tubular cells that sense salt and regulate renin release. Cell # in MD can be regulated by angiotensin and further work should examine whether lower cell #/MD is an adaptation to protect ODM females from hypertension.

PAS DATE/TIME/LOCATION May 6, 2013; 4:15 pm– 7:30 pm;
ROOM: Hall D/E (Walter E. Washington Convention Center)
Board Number: 217

****PAS Oral Presentation**

PBX1/2 ARE REQUIRED IN THE DEVELOPING LUNG MESENCHYME FOR NORMAL POSTNATAL LUNG DEVELOPMENT

David J McCulley, Elizabeth A Hines, Licia Selleri, Xin Sun

Background: Congenital diaphragmatic hernia remains among the most common, lethal congenital birth defects. Despite improvements in the medical and surgical management of patients with diaphragmatic hernia, the genetic basis of the condition remains unclear. The degree of pulmonary hypoplasia and pulmonary vascular disease associated with diaphragmatic hernia varies between patients. A current hypothesis is that a core group of genes is involved in both the development of the diaphragm and the development of the lung and pulmonary vasculature. Mutation of these genes or disruption of their downstream signaling cascades is likely responsible for the severe pulmonary hypoplasia and pulmonary hypertension that affects a subset of patients with congenital diaphragmatic hernia. Recently, a group of genes was identified as playing an important role in development of the diaphragm. Pre-B-cell leukemia transcription factor 1 (Pbx1) was included in this list and its global deletion in mice results in diaphragmatic hernia. Pbx1 is highly conserved in humans and plays an important role in the development of several tissues, however the role of Pbx1 in lung and pulmonary vascular development has not been explored.

Objective: To study the role of Pbx1/2 in the developing lung mesenchyme with a primary focus on postnatal alveogenesis and development of the pulmonary vasculature and vascular smooth muscle. **Design/Methods:** Using a conditional knockout approach in a mouse model, we have eliminated the expression of Pbx1/2 in the developing lung mesenchyme. We have analyzed the phenotype at late embryonic and early postnatal stages and have used immunofluorescent markers to study the effect of loss of PBX1/2 in the developing lung epithelium, airway smooth muscle, vasculature, and vascular smooth muscle.

Results: Loss of PBX1/2 in the developing lung mesenchyme results in mice that have normal embryonic lung development, but fail to undergo postnatal lung maturation. These mice die within the first 21 days of life and have a simplified lung architecture that has failed to undergo normal postnatal alveogenesis. The mutant mice also have evidence of right heart failure with right ventricular hypertrophy and right atrial enlargement.

Conclusions: PBX1/2 is required for normal postnatal lung alveogenesis and loss.

PAS DATE/TIME/LOCATION May 6, 2013; 3:30 pm–5:30 pm (~4:15pm); *ROOM:* 145B (Walter E. Washington Convention Center)

****PAS Oral Presentation**

LASTING EFFECTS OF A BI-DIRECTIONAL INTERNATIONAL RESIDENT EXCHANGE – TANZANIAN RESIDENT FEEDBACK OVER FIVE YEARS

Michael Pitt, Sabrina Butteris, Sophia Gladding

Background: In 2007, a bi-directional pediatric resident exchange program was established between Ann & Robert H. Lurie Children’s Hospital of Chicago and Bugando Medical Centre (BMC) in Mwanza, Tanzania. From 2007-2012, 59 third-year residents from Lurie Children’s and 13 second-year residents from BMC participated in the exchange.

Objective: Determine the impact exchange on the BMC residents who participated in terms of their practice of medicine or teaching, their view of local system change, and their relationships with visiting (US-based) residents.

Methods: With IRB approval from both institutions, an online survey with 24 open-ended and 5 Likert scale questions was sent to the BMC residents who participated in the exchange. Participation was voluntary and anonymous. We conducted a content analysis of the written responses quantifying the number of responses and selected representative quotes from each of the survey’s main categories.

Results: The survey response rate was 77% (10/13). Every respondent reported the experience positively impacted their ability to answer clinical questions. Many residents (77%) cited

specific patient examples including improvements in knowledge (e.g. management of croup, newborn resuscitation) as well as broader concepts like “widening my differential diagnosis,” “open[ing] up for different ideas from different people,” and “attitude change.” The majority, 85%, gave examples of improved teaching including “using simulation,” “using positive reinforcement” and being “more accommodating to . . . slow learners.” Most residents noted systems changes at BMC resulting from the exchange, with 77% citing specific changes including initiating “morning report and sign-out” and improved “resident communication.” Many residents (75%) indicated the exchange changed their views of US residents noting, “I see them as colleagues” and “I am more aware of what they have in mind and the shock they go through.”

Conclusions: The majority of BMC residents who participated in the exchange at Lurie Children’s cited lasting positive impacts on their clinical decision-making, teaching, systems at BMC, and view of visiting residents. Trainee exposure to different systems appears to be an effective mechanism for generating change. This type of bi-directional exchange, rather than the more typical unilateral visits by US trainees, should be encouraged as pediatricians attempt to improve the health of children worldwide.

PAS DATE/TIME/LOCATION May 6, 2013; 2:00pm; 146C

May 7, 2013

Workshop

BLOGS AND WIKIS AND FEEDS, OH MY! BASIC INTRODUCTION TO INTERNET TECHNOLOGIES TO PLAN, PRODUCE AND PROMOTE YOUR PROJECTS

Dipesh Navsaria, Donna Marie D'Alessandro

Target Audience: Any PAS participants who wish a basic familiarity with Web 2.0 applications and how to practically apply them to projects in academic medicine. Those interested in teaching colleagues and learners these skills may also find this useful.

For 20 years, the Internet has served as a medium through which information is collected, posted and shared. Newer Internet-based technologies (also known as Web 2.0) promise to expand the role of the Web in academics, by allowing groups of trainees and their teachers to collaborate to share, edit and refine information. However, learning sessions often assume a basic facility with Internet technologies, which many do not necessarily have. We aim to be the foundational workshop to not only educate about the appropriate tools but to guide appropriate and intelligent thinking on how these tools can be productively applied. Web 2.0 technologies will be introduced and demonstrated at a basic level, along with examples of their use in a variety of academic projects. Technologies covered will include blogs, wikis, RSS feeds, Facebook, Twitter and social bookmarking. Intelligent, realistic, and practical uses will be emphasized that would require only a minimal programming or "technical" background. Participants will be asked to consider ways these technologies could facilitate and be integrated into their current projects or planned projects at their home institutions using project planning worksheets and large and small group discussions. Cases studies from the leaders experiences will exemplify of project planning, actual production and turning it into academic scholarship (or promotion). Barriers and potential solutions will be discussed and participants will be provided with resources and links to use after the meeting.
May 7, 2013 8:30 AM – 11:30 AM Washington Convention Center 143 C

****PAS Poster Presentation**

INTRAPULMONARY ARTERIOVENOUS ANASTOMOSES IN ADULTS BORN PRETERM: EFFECTS OF EXERCISE AND NITRIC OXIDE

ET Farrell, ML Bates, DF Pegelow, M Palta and MW Eldridge

Background: Intrapulmonary arteriovenous anastomoses (IPAVA) are large-diameter pathways present in the normal lung vasculature, which are recruitable in adults by exercise and hypoxia. The majority of humans experience IPAVA recruitment. Given that individuals born preterm can experience arrested lung development and vascular hyperreactivity, we hypothesized that IPAVA recruitment might be blunted or absent in this population. Secondly, we aimed to determine if nitric oxide is a mediator of IPAVA recruitment during exercise.

Objective: Our aim was to determine if young adults with a history of preterm birth show altered recruitment of IPAVA with exercise compared to term controls. We also aimed to determine if inhaled nitric oxide (iNO) modulates IPAVA recruitment.

Methods: Adults (20-23 years, <1500 g at birth) with a history of preterm birth (PT) and age-matched control subjects (CTLs) were recruited. A saline contrast echocardiogram was performed at rest and every 10W during an incremental cycle exercise, performed with and without iNO, to evaluate IPAVA patency. The degree of transpulmonary bubble passage was scored using a 0-5 scale.

Results: Transpulmonary passage of saline contrast was observed in all subjects, CTL and PT, during exercise in normoxia, but not at rest. This shows that IPAVA are present and recruitable in PT adults. Furthermore, iNO causes both the recruitment of IPAVA at earlier workloads and an increase in the bubble score at equal workloads in CTL subjects only. Interestingly, because this increase was not present in PT subjects, we conclude that either IPAVA themselves or the signaling pathway(s) regulating their recruitment are altered in this population.

Conclusion: Transpulmonary passage of saline bubble contrast in PT subjects shows that IPAVA are present and recruitable in this population. However, the inability of iNO to increase bubble scores at equal exercise workloads in the PT subjects, in contrast to CTLs, indicates that PT birth may have lasting effects on the pulmonary vasculature and/or the signaling pathways that modulate it.

PAS DATE/TIME/LOCATION May 7, 2013; 10:00 AM - 2:00 PM; Hall D/E; Board Number 295

****PAS Poster Presentation**

COMPARISON OF PAIN MANAGEMENT IN PEDIATRIC AND ADULT TRAUMA PATIENTS

Rebecca Mitchell, Ashley Maglio, James Svenson, Zhanhai Li, Michael Kim

Background: Over last two decades, there have been significant advances in acute pain management in adults and children, however minimal progress has been reported in pain management in patients with multisystem trauma. Historically, pain management for children has been significantly inferior to adults in general and evidenced in those with burns, sickle cell crisis, and fractures. Noting this trend in pain management disparity, we plan to evaluate acute pain management practices between children and adults with multisystem trauma.

Methods: A chart review was performed at a level 1 pediatric and adult trauma center. Data were abstracted on children (<18 years) who had trauma activation from May 2010 through May 2012 and adult (≥ 18 years) patients presenting between May 2010 and December 2011. Data abstracted include demographic information, type of trauma, injury type and location, interventions, pain assessment, analgesic administration, disposition, diagnosis, and injury scores. Also included are time to pain medications and dose. Opioid pain medications included fentanyl, morphine, and hydromorphone. Descriptive statistics was used for data analysis.

Results: A total of 469 pediatric and 331 adult trauma patients were identified. The mean age was 11+-6 yrs in children compared to 48+-21 yrs in adults. There were no significant differences in make-up of patient ethnicity, but there were 47% female adult patients compared to 39% in children. The length of stay in the ED was longer for adults (227+-103 min versus 180+-99 min). There were differences in the proportion of patients who had initial pain assessment documentation: 69% in adults and 61% in children. Proportion of patients who had multiple pain assessments documentation also was higher in adults compared with children (37% vs 29%). Significantly more adults received opioid in the ED (65% vs 50%) than children. The mean time to the first opioid dose was 61+-66 min for adults and 42+-46 min for children. Adults more frequently received multiple doses of opioid than children (64% vs 53%). **Conclusions:** Based on the preliminary data, pain assessment documentation for both adults and children are inadequate. Differences in trauma pain management exist between adults and children. These differences suggest that children receive less pain assessments and opioid analgesia. Additional analysis and studies are needed to fully understand the difference between the two patient populations and to develop programs to improve overall pain management practices.

PAS DATE/TIME/LOCATION May7, 2013; Hall D/E; Board Number 442

****PAS Poster Presentation**

USE OF WHOLE EXOME SEQUENCE ANALYSIS TO IDENTIFY CAUSAL VARIANTS IN CONGENITAL VERTEBRAL MALFORMATIONS

Alex Stoddard, Mark Stephan, Kristen Rasmussen, Cathy Raggio, Linlea Armstrong, Blank, Janet Livingston, Ulrich Broeckel

Background: Congenital vertebral malformations (CVM) represent defects in formation and segmentation of somites occurring with an estimated incidence of between 0.13-0.50 per 1000 live births. Extreme genetic heterogeneity has made it difficult to identify mutations in patterning genes associated with CVM.

Objective: The objective was to identify causal variants for CVM using a whole exome sequencing (WES) methodology.

Design/Methods: Two families with different phenotypic congenital vertebral malformation phenotypes, each with an autosomal dominant inheritance pattern were sequenced utilizing Agilent SureSelect hybridization-based exome capture methodology. A filtering strategy using CASAVA, samtools and GATK to prioritize sequence coding variants included requirements for heterozygosity in affected individuals, absence of variant in unaffected individual, filtering by high impact variants such as stop/gain-loss and nonsynonymous coding change and filtering by population frequency as observed in the NHBLI exome variant server data set in which a given variant must have a minor allele frequency of <1%.

Results: A filtered list of approximately 20 genes with corresponding possible causal variants was identified for each patient. Among the candidate genes, a nonsynonymous mutation in TLE4 (NM_007005:exon14:c.A1318G:p.T440A) was identified in an affected father and both daughters with L1 hypoplasia, congenital kyphosis and prolonged patency of the anterior fontanelle. A nonsynonymous mutation in PPIB (NM_000942:exon4:c.C404T:p.P135L) was identified in an affected father and both daughters with cervical, thoracic and sacral CVM, hearing loss, cleft palate and the Sprengel deformity.

Conclusions: Based on the known biologic functions of TLE4 and PPIB it is reasonable to speculate that heterozygous mutations in either can be associated with CVM phenotypes. TLE4 is a transcription factor which has an important role in cell fate and boundary specification and interacts with Notch signaling mutations. Ppib^{-/-} mice have a severe osteogenesis imperfecta phenotype and develop an enhanced curvature of the spine. WES has promise to discover causal variants associated with CVM. Functional studies in model systems are required to confirm proof of pathogenicity.

PAS DATE/TIME/LOCATION May 7, 2013; 10:00 AM – 2:00 PM; Hall D/E 4503 Poster 107

****PAS Poster Presentation**

DISPARITIES IN HEALTH SUPERVISION FOR CHILDREN WITH DOWN SYNDROME

Katie B Williams, Jens Eickhoff, Ellen R Wald, David S Wargowski

Background: Down Syndrome is the most common chromosomal disorder and affects approximately 1/700 live births in the United States. The American Academy of Pediatrics (AAP) published health supervision guidelines for the care of children with Down Syndrome in 2001 to guide primary care practitioners in caring for these medically complex children.

Objective: The purpose of this study is to determine how well the AAP guidelines are followed by well-trained primary care providers practicing in a high quality health system.

Design/Methods: A retrospective chart review of patients with Down Syndrome age ≤ 21 years between March 2001 and July 2012 was conducted. Cervical spine imaging, complete blood counts (CBC), thyroid function tests, audiology exams, and ophthalmology exams were reviewed. Screening was considered compliant if it was completed within 6 months before or 6 months after the recommended date.

Results: 40 children with Down Syndrome with an average age of 9.8 years at the time of chart review were included in the study. The majority of children were Caucasian (85%), had private health insurance (75%), and saw a pediatrician exclusively for primary care (75%). Cervical spine imaging was completed either before or at the recommended age for 95% of the children. Overall compliance with CBC and thyroid function screening was 45% and 64%, respectively. Adherence to audiology and ophthalmology exam recommendations was 38% and 45%, respectively. Overall, as the age of the child increased, the number of encounters with the primary care provider and the compliance with recommended screening decreased. Statistical analysis is ongoing to determine which specific age ranges had the lowest compliance rates with recommended screening and if there are associations between gender, type of health insurance, or type of primary care provider and low adherence to recommended screening.

Conclusions: We found excellent compliance with cervical spine imaging guidelines, but low rates of recommended CBC screening, thyroid function testing, audiology exams, and ophthalmology exams among children with Down Syndrome in a community of well-trained practitioners. It is important to identify specific children at risk for poor health supervision and barriers to adequate care in order to improve the health of children with Down syndrome as the new AAP guidelines (published in 2011) are being implemented.

PAS DATE/TIME/LOCATION May 7, 2013; 10:00 AM- 2:00 PM; Exhibit Hall D/E, Walter E. Washington Convention Center, Board Number 120