



**Stony Brook Children's**

STONY BROOK LONG ISLAND CHILDREN'S HOSPITAL

# **Pediatric Research Day**



**May 15, 2013**

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Welcome to the fifth annual Pediatric Trainee Research Day. It is a pleasure to share with you today the work our residents and trainees have been carrying out in children's health research and scholarship.

As we continue on our journey to creating a world class children's hospital program, we are committed to providing hope to sick children and their families by carrying out the research that will improve existing treatments and make the discoveries that will lead to new approaches to pediatric diseases.

To prepare the next generation of pediatricians to take part in this mission, each of our trainees is required to carry out a mentored project during their training. Coming from diverse backgrounds they can select from a spectrum of projects to best suit their career goals and meet their educational needs. Today they will have the opportunity to present their work to their faculty, peers and other colleagues.

Thank you for joining us and showing support to these young investigators. Special thanks also to Dr. Marian Evinger and Dr. Janet Fischel for coordinating the day, Dr. Sameer Lapsia who helped the presenters with their posters, members of the Pediatric Scholarship Oversight Committee, and all of the faculty who have served as mentors and provided guidance and encouragement to our trainees.

Sincerely,

Margaret M. McGovern, MD, PhD

Professor and Chair of Pediatrics

## AGENDA

8:00 – 8:30 Registration and Breakfast – Wang Center Lobby

8:30 – 8:45 Opening remarks: Dr. Margaret McGovern –Main Theater

8:50 – 9:40 Keynote Address – Main Theater

**Hulya Bayir, MD**, University of Pittsburgh,  
Associate Professor, Department of Critical Care Medicine  
*“Assessment and Modulation of Oxidative Stress in Pediatric Critical Care”*

9:45 – 10:35 Residents Platform Presentations – Main Theater

**Ben Albert, MD**: *“The Effect of an Electronic Medical Record with SBAR Documentation of Patient Events in a Pediatric Intensive Care Unit”*

**Luz Karas, MD**: *“Epidemiology of Tick Vectors in Suffolk County and Clinical Implications”*

**Rick Siriratsivawong, MD**: *“The Correlation of Cystic Fibrosis disease severity markers including FEV1, HbA1C, and BMI among Stony Brook CF Center Patients”*

10:35 – 10:45 Coffee Break – Theater Lobby

10:45 – 11:15 Fellows Platform Presentations – Main Theater

**Niyati Skaria, MD**: *“Accuracy of Continuous Glucose Monitors in Patients with Diabetic Ketoacidosis”*

**Yury Yakubchyk, MD**: *“The Influence of TiO<sub>2</sub> nanoparticles and UVB Irradiation on Murine Macrophages Infectivity”*

11:20 – 12:35 Poster Session – Theater Lobby

12:35 – 1:30 Lunch – Zodiac Gallery (Lower Level)

Dr. Bayir to discuss her academic medicine research path

*“Assessment and Modulation of Oxidative Stress in Pediatric Critical Care”*

Presentation of awards and closing remarks by Dr. Margaret McGovern

## Keynote Speaker Biography

**Dr. Hülya Bayır** graduated from Hacettepe University Medical School in Ankara, Turkey in 1995. She completed an internship in pediatrics at Hacettepe Children's Hospital, and subsequently joined the pediatric residency program at SUNY Stony Brook from which she graduated in 1999. As a resident at Stony Brook she was recognized as the Best Ambulatory Care Intern of the Year, received the Department of Pediatrics' Citizenship Award, and the Resident Research Award given by Suffolk Pediatric Society. Completing fellowship training at Children's Hospital of Pittsburgh in 2002, Dr. Bayır stayed on at CHP, joining the faculty, where she is now an associate professor in the Department of Critical Care Medicine.

Dr. Bayır is a true a physician-scientist. In her clinical duties, she is Associate Director of the 36 bed pediatric intensive care unit, and charter member of the Pediatric Neurointensive Care at CHP. In her role as scientist she is the Director of Research for Pediatric Critical Care Medicine. Recognizing these talents as a physician-scientist, the University of Pittsburgh has appointed her Associate Director of the nationally known Safar Center for Resuscitation Research. She is the principal investigator for several NIH R01 and U19 grants totaling over \$2 million; her research has focused on mechanisms of neuronal death and mitochondrial injury and oxidative signaling pathways in ischemic and traumatic brain injury in infants and children. Her research has recently been published in *Nature Neuroscience*, *Critical Care Medicine*, *JBC*, *JAMA*, and *Biochemistry* among other journals.



# Abstracts

## Resident Platform Presentations

1. Ben Albert, MD (Page 8)  
*The Effect of an Electronic Medical Record with SBAR Documentation of Patient Events in a Pediatric Intensive Care Unit*
2. Luz Karas, MD (Page 9)  
*Epidemiology of Tick Vectors in Suffolk County and Clinical Implications*
3. Rick Siriratsivawong, MD (Page 10)  
*The Correlation of Cystic Fibrosis disease severity markers including FEV1, HbA1C, and BMI among Stony Brook CF Center Patients*

## Fellow Platform Presentations

4. Nyati Skaria, MD, Pediatric Endocrinology (Page 11)  
*Accuracy of Continuous Glucose Monitors in Patients with Diabetic Ketoacidosis*
5. Yury Yakubchyk, MD, Pediatric Infectious Diseases (Page 12)  
*The Influence of TiO<sub>2</sub> nanoparticles and UVB Irradiation on Murine Macrophages Infectivity*

## Resident/Student Posters

6. Nisha Aravindakshan, MD (Page 13)  
*Case Report: A case of a red herring rash*
7. Sanjida Cabot, MD (Page 14)  
*Clinical Characterization of a Young Girl with Microdeletion of 1p32.3*
8. Laurie Campfield, DO (Page 15)  
*Breastfeeding Knowledge, Attitudes and Beliefs: A Survey of Pediatric Residents in a Tertiary Hospital Setting*
9. Claudia Conde, MD (Page 16)  
*Parental Perception of Video Game Use in Adolescents*
10. Kim Derespina, MD (Page 17)  
*A 6-year-old Boy with an Unusual Presentation of SLE Lupus Erythematosus Tumidus and Systemic Manifestations*

11. Margaret Dyer, MD (Page 18)  
*Knowledge Assessment of Caregivers of Young Soccer Players Regarding Sports-Related Concussion*
12. Gagandeep Gill, MD (Page 19)  
*Netti Pot, Netti Not: Septic Thromboembolic Phenomenon in a Patient linked to chronic Netti Pot Use*
13. Caitlin Heyden, MD (Page 20)  
*The Effect of an Electronic Medical Record on Turnaround Times of Physician Documentation in an Out-Patient Clinical Setting*
14. Katherine Huston, MD (Page 21)  
*Concussion Aftercare Instructions from the Pediatric Emergency Department: A Quality Improvement Project*
15. Amrik Singh Khalsa, MD (Page 22)  
*The Effects of High Weight-for-Length on Development in Infants*
16. Lauren Ng, DO (Page 23)  
*A Developmental Model of Physician Empathy and Compassionate Care*
17. Ebrahim Oomerjee, MD (Page 24)  
*The Effects of a High BMI on Development in Toddlers*
18. Crystal Sachdeva, MD (Page 25)  
*A Novel Presentation of Chlamydia Trachomatis Infection in a Young Male: Case Report*
19. Alexis Santiago, MD (Page 26)  
*Early Discontinuation Patterns of Hormonal Contraception in Adolescent Females*
20. Hetti Wickramasinghe, MD (Page 27)  
*Review Article on Asthma in Infancy and Early Childhood*
21. Jason Lai, MS II (Page 28)  
*Keeping Families Healthy: Caregiver Perception, Diet, and Exercise among Overweight and Obese Young Children Enrolled in a Home Visitation Program*
22. Heena Shukla (Page 29)  
*Keeping Families Healthy: A Look at the Demographic Profile of the Intervention Group*

Resident & Fellow Posters

23. Kim Derespina, MD & Rebecca Abell, DO (Page 30)  
*Increasing Prevalence of Overweight and Obese Children at time of Diagnosis of Celiac Disease*
24. Nisida Berberi, MD & Sameer Lapsia, MD (Page 31)  
*Childhood Cancer Syndrome: A new type of Lynch Syndrome with Café-au-lait spots*

Fellow/Faculty Posters

25. Josette Bianchi-Hayes, MD (Page 32)  
*Healthcare Utilization in Obese Children*
26. Alexa Calero, MD (Page 33)  
*Does Hypoxia Evoke Enkephalin Release from Chromaffin Cells? Investigating a Novel Stress-Response to Acute Hypoxia*
27. Michelle Edelman, MD (Page 34)  
*The effect of Food Additives and Bacterial Antigens on Intestinal Epithelial Cells*
28. Michelle Edelman, MD (Page 35)  
*Fluoroscopy – A valuable Modality in retrieving Ingested Magnets*
29. Sehar Ejaz, MBBS (Page 36)  
*Outcome of Isolated Premature Menarche: A retrospective and follow up study*
30. Jagadish Elumalai, MD (Page 37)  
*Acute Effects of Hyperoxia on Gene Expression in Lipopolysaccharide-treated Newborn Rat Lung*
31. Jagadish Elumalai, MD (Page 38)  
*Increase Use of CPAP and early surfactant to reduce Bronchopulmonary Dysplasia*
32. Sameer Lapsia, MD (Page 39)  
*Effect of immunosuppressive therapy on Epstein-Barr Virus lytic activation in patients with IBD*
33. Shahriar Mokrian, MD (Page 40)  
*A randomized, pilot study of the Short Term Respiratory Effects of Synchronized Bi-Level Nasal CPAP vs. standard Bi-Level CPAP in Very Low Birth Weight Infants*
34. Asif Noor, MBBS (Page 41)  
*Protocol for Standard Empiric Antibiotic and early Oral Transition in Children with Acute Osteomyelitis based on microbiologic data from a two-year retrospective review*
35. Asif Noor, MBBS (Page 42)  
*Practice Survey of Prophylactic Antibiotic Use in Pediatric Orthopedic Surgery*
36. Salman Rashid, MD (Page 43)  
*Hypophysitis in Pediatrics: Spare the Scalpel?*
- 37-39. Jonathan Mintzer, MD (Pages 44-46)  
*Real-Time Cerebral, Splanchnic, and Renal Near-Infrared Spectroscopy in Very Low Birthweight Neonates: An Analysis of Baseline Variability*
- Near-Infrared Spectroscopy Evaluation of Sodium Bicarbonate Corrections in Very Low Birth Weight Neonates*
- Effects of “Booster” Packed Red Blood Cell Transfusions on Cerebral, Renal, and Splanchnic Near-Infrared Spectroscopy in Very Low Birth Weight Neonates During the First Postnatal Week*

## ABSTRACT 1

### The Effect of an Electronic Medical Record with SBAR Documentation of Patient Events in a Pediatric Intensive Care Unit

Ben Albert MD, Margaret Parker MD, Rahul Panesar MD

**Introduction/Purpose of the Study:** There is limited literature evaluating the integration of the electronic health record (EHR) to a structured communication template such as the SBAR (Situation, Background, Assessment, and Recommendation) model to improve physician documentation of significant in-patient events.

**Hypothesis:** We hypothesized that an electronic SBAR template within the EHR would improve interdisciplinary communication with more frequent, higher quality physician documentation compared to traditional paper charting.

**Methods:** We reviewed 542 PICU admissions over 9 months, collecting 84 documented patient events. Three time periods were studied: 1) paper chart documentation, 2) electronic free-text notes after EHR implementation, and 3) electronic documentation with an SBAR template option. Each event note was scored to assess quality by allotting 1 point for each completed element of the SBAR, totaling 4 points. Documentation pre- and post- implementation of the EHR and SBAR template note was examined using ANOVA and chi-square analysis to assess quality and frequency.

**Results:** The frequency of event notes showed an increasing trend from paper documentation (12.7%), to EHR free-text notes (14.2%), and greater after instituting the electronic SBAR note (19.8%,  $p = 0.071$ ). Mean scores assessing quality were 2.23 points (95% CI = 1.96-2.50) with paper documentation, 2.57 patients (95% CI 2.17 -2.97) with EHR free-text notes, 3.24 patients (95 CI = 2.90 – 3.57) after initiation of the SBAR template note, and 4.0 patients when only the SBAR template was used ( $p < 0.0001$ ). Nurses were never identified (0%) with paper documentation, identified 7.1% with free-text EHR and 44.1% post-SBAR template note ( $p < 0.0001$ ). Analysis of the SBAR notes alone showed 100% identification ( $p = 0.006$ ). The attending physician was notified 18.2% with paper documentation, 53.6 % with EHR free-text note, 79.4% post- SBAR template ( $p < 0.0001$ ) and 100% notified when only the SBAR template note was used ( $p < 0.0001$ ).

**Conclusion:** The implementation of an SBAR template within the EHR resulted in higher frequency and higher quality documentation of significant patient events, with increased multidisciplinary communication.



## ABSTRACT 2

### Epidemiology of tick vectors in Suffolk County and Clinical Implications

Luz Karas MD, M Evans, Shane McAllister MD, Christy Beneri DO

**Background:** In Suffolk County, NY, there is an extensive history of tick-borne infections. These include Lyme disease, Babesiosis and Anaplasmosis transmitted by the *Ixodes scapularis* tick (deer tick), Rocky Mountain Spotted Fever transmitted by the *Dermacentor variabilis* tick (dog tick), and Ehrlichiosis transmitted by the *Amblyomma americanum* tick (lone star tick). Despite the high prevalence of Lyme disease in our area, the lone star tick may play an increasing role in other tick-borne infections. An increased percentage has been recognized in our area by the NYS Department of Health from 1976 through 1989. Others have observed a change in the distribution with spread from the south to the Atlantic coast of Long Island. The aim of this study is to report the number and type of ticks collected in our area. The purpose will be to assess the prevalence of different ticks that may impact the epidemiology of tick-associated illnesses in our community. We hypothesize that the number of the lone star ticks will be at least equal to the number of deer ticks.

**Methods:** Stony Brook Lyme Lab routinely performs tick identification as an unsolicited service or when requested by physicians. Data was reviewed from July 2006-December 2011. All specimens have been identified first as tick or not, tick species, and month of the year. Stage was also documented as larvae, nymph or adult.

**Results:** Three tick species were reported: 290 lone star ticks (predominantly April-August), 215 deer ticks with bi-phasic pattern (predominantly from April-July and October-December), and 66 dog ticks (predominately May-July). During their peak, 269 lone star ticks were identified, of which 193 (71.7%) were staged as adults, 67 (24.9%) nymphs and 9 larvae (3.4%). For the deer tick, peaks: April-July peak 101 ticks were identified, 49 (48.5%) nymphs and 52 (51.5%) adults and October-December peak 86 ticks were identified, 84 (97.6) adults and 2 (2.4%) nymphs. Finally, 66 dog ticks were identified April-August, 100% were adult ticks.

**Discussion:** The lone star tick has increasingly been appreciated in our area, but it was not clear that this species might outnumber the deer tick. Hence the epidemiology for tick-borne illnesses may be changing. This would have important clinical impact on how physicians approach, diagnose and treat patients with reported tick bites. The biphasic distribution of the deer tick has not been described before in the literature and may be due to changing weather patterns. However, the stages documented correspond to the expected maturity for the season and the tick life cycle. The limitations of this study include the fact that people in the community may comfortably recognize the deer tick and less likely to bring them in for identification. In addition, the deer tick is slightly smaller and may not be noticed on patients' skin; therefore they tend to be unrecognized relative to the lone star tick.

## ABSTRACT 3

### **Correlation of Cystic Fibrosis disease severity markers including FEV1, HbA1C, and BMI among Stony Brook CF Center Patients**

Rick Siriratsivawong MD, Catherine Kier MD

**Background:** Cystic Fibrosis is a multi-organ systemic illness resulting from a genetic defect in chloride channel function. Chloride channel dysfunction not only leads to impaired airway clearance but also affects pancreatic endocrine function leading to Cystic Fibrosis-Related Diabetes (CFRD). CFRD is an emerging distinct disease separate from its other diabetes counterparts. Morbidity and mortality from CFRD does not result from vascular injury and its complications as in DM-Type I and Type II, but rather from pulmonary compromise and respiratory failure. HbA1C measurement is not part of the consensus guidelines for CF clinical care and therefore not routinely used as a marker in CFRD care.

**Objective:** This retrospective study proposes to find correlations between pulmonary function, i.e. FEV1, and CFRD control, i.e. HbA1C; and as well as markers of overall nutritional status, i.e. BMI and prealbumin.

**Study Design/ Methods:** We started with a retrospective chart review of all 76 CF diagnosed patients under the care of the Stony Brook CF Center from 1990-2012. Chart review included both online Powerchart system as well as actual paper chart data gathering. 13 patients with CFRD were identified, ages ranging from 16 to 38 years old. Data from non-CFRD patients were also collected for future age-matched controls. Data collected included FEV1, Weight/Height/BMI, HemoglobinA1C, Prealbumin, and ESR. ESR was followed as a marker of inflammation to correlate with pulmonary exacerbations, as well as prealbumin levels. Data were plotted for each CFRD patient and analyzed for visual trends between variables and temporal correlations.

**Results:** Of the 13 CFRD patients identified, 8 had sufficient information to analyze any trends. The most significant finding was a temporal decrease in FEV1 before a noticeable increase in HbA1C in 7/8 patients (88%). Improvements in FEV1 over time did not necessarily improve HbA1C levels. BMI decreased as FEV1 decreased, following the same curve – 6/8 (75%). As expected, decreases in FEV1 were marked with increased levels of ESR – 6/8 (75%). Additionally, prealbumin and ESR had an inverse relationship indicated overall inflammatory process leading to undernutrition – 6/8 (75%). Prealbumin did not significantly correlate with FEV1 or BMI curves.

**Conclusions:** A significant decrease in lung function/FEV1 was soon followed by a rise in HbA1C, indicating complex interplay between pulmonary exacerbations and glycemic control. In patients with improvements in HbA1C, FEV1 did modestly improve but not to the pre-exacerbation levels, indicated chronic inflammation and airway changes. In addition to fasting blood sugars and oral glucose tolerance tests (which are part of current guidelines), HbA1C trends can be used in improving quality of clinical care by intensifying the nutritional regimen before any further decline in FEV1 or increase in CF exacerbations.

## ABSTRACT 4

### Accuracy of Continuous Glucose Monitors in Patients with Diabetic Ketoacidosis

Niyati Skaria MD, Thomas Wilson MD, Catherine Messina PhD, Andrew Lane MD

**Background:** Continuous glucose monitors (CGM) are increasingly used in the outpatient setting. Patients may make clinical decisions based on CGM readings, including during development of diabetic ketoacidosis (DKA). Volume contraction during DKA contributes to acidosis via lactic acid production and associated hydrogen ions. Because CGM devices rely on measurement of generated hydrogen ions, it is unknown whether DKA affects CGM accuracy.

**Objective:** We aim to determine whether a commercially available CGM (Dexcom) measures blood glucose measurements accurately compared to a standard-of-care bedside glucometer in the setting of DKA.

**Design/Methods:** Successive eligible patients over 2 years of age admitted to our hospital in DKA (venous pH < 7.25) were invited to participate. Venous blood gases and chemistry panels were drawn as per standard ICU protocol. Exclusion criteria: other known metabolic conditions, or dermatologic conditions preventing sensor placement. The CGM was placed subcutaneously at presentation. After warm-up, CGM was calibrated to the bedside glucometer initially, and every 12 hours. CGM values were analyzed by comparison to bedside and serum glucose values.

**Results:** In this ongoing study, 215 paired references vs. CGM values have been obtained to date from 11 patients, ages 12 to 19 years old. The mean absolute relative difference (MARD) between glucometer and CGM values is 36.7% (SD=36.7). The MARD between serum glucose and CGM values is 33.6% (SD=33.8). The MARD between mild, moderate, and severe acidosis groups was not statistically different ( $p > .05$ ). In a Clark Error Grid Analysis- 50% of values fell in category A - desirable correlation and 28% in category B - acceptable correlation. A total of 78% fell in category A and B. Of the rest of the values, 21% fell in category C - risk for inappropriate treatment, 1% in categories D and E - high risk.

**Conclusions:** Other investigators studying correlations between CGM and reference values in healthy individuals with diabetes have demonstrated MARDs of 13.2 to 21.5%, and 98% of values falling within Clarke Error Grid category A and B. In contrast, our data suggest that during DKA, there is a much higher MARD between CGM and reference values, and more values fall outside Clarke categories A and B. Our results have important implications in counseling patients and caretakers regarding reliance on CGM values at times of risk for the development of DKA.

## ABSTRACT 5

### The Influence of TiO<sub>2</sub> nanoparticles and UVB irradiation on murine macrophages infectivity by *Leishmania tropica*

Yury Yakubchyk MD, Miriam Rafailovich

**Background:** Leishmaniasis is a parasitic disease affecting millions of people all over the world, mostly in developing countries. Toxicity of existing antileishmanials and growing parasites resistance to them necessitate a search for new treatments of this illness. Nanoparticles (NPs) produce reactive oxygen species (ROS) to which leishmania are very sensitive, and use of NPs for controlling of leishmaniasis can be considered as a new approach in treatment. Titanium dioxide (TiO<sub>2</sub>) NPs due to their known antibacterial properties are commonly used in industry and medicine. These NPs can penetrate the cell membranes and alter multiple cellular functions by a variety of ways including ROS production. It is unknown how low (non-toxic for cells) doses of TiO<sub>2</sub> NPs affect an intensity of infection of J774A.1 macrophages (MΦs) with *Leishmania tropica* (*L. tropica*), and how UVB light affects a microbicidal activity of these NPs.

**Methods:** *L. tropica* and MΦs separately were exposed to low doses (0.05-0.2 mg/ml) of TiO<sub>2</sub> NPs (+/- UVB) with assessment of parasites and cells proliferation. Treated with NPs MΦs were infected with *L. tropica*, then - exposed to UVB, stained with Giemsa for determination of percentage of infected MΦs and intensity of infection by light microscopy. Transmission Electron Microscopy (TEM) was used for determination of morphological changes of parasites within infected MΦs. Intracellular ROS production was assessed by flow cytometry.

**Results:** There was no significant difference in effects of low doses of TiO<sub>2</sub> NPs on parasites and MΦs proliferation even with UVB irradiation. TEM showed sequestration of the parasite and NPs within the same parasitophorous vacuole (PV), yet *L. tropica* viability was not affected by the presence of NPs within the PV without UVB. Addition of UVB has changed the morphology of sequestered leishmania dramatically with presence of parasites renescents. Percentage of infected MΦs and intensity of their infection with *L. tropica* were reduced by 20-30% in groups exposed to UVB compare to controls ( $p < 0.05$ ). Exposure to NPs resulted in induction of the microbicidal (antileishmanial) activity of TiO<sub>2</sub> NPs, and the rate of the induction directly correlated with ROS production boosted by UVB light.

**Conclusions:** Our results indicate a synergistic antileishmanial activity of low doses of TiO<sub>2</sub> NPs and UVB irradiation through enhancement of ROS production.

## ABSTRACT 6

### Case Report: A case of a Red Herring Rash

Nisha Aravindakshan MD, Robert Reilly MD

**Background:** Adult onset Henoch-Schonlein Purpura (HSP) is a rare entity which entails an extensive work up, and aggressive management, in order to prevent severe resulting sequelae. It is often not the acute presentation, but the potential for the existence of an underlying malignancy, that warrants our attention.

**Case:** This case is that of a 68 year old obese female ex-smoker with underlying hypertension and hypothyroidism who presented with a severe rash which seemed to follow primary exposure to a popular topical analgesic cream. The patient reported complaints of vague abdominal and unilateral knee joint pain two weeks prior to admission. She had been taking acetaminophen and ibuprofen for pain relief several days prior without relief and had used an over the counter topical salicylate-based analgesic cream on only the affected joint. The morning after applying this cream, both knee and ankle joints were swollen and a vesiculobullous, erythematous, mildly pruritic, purpuric rash had erupted on her left lower extremity, subsequently spreading to the contralateral leg and then migrating, over several days duration, to her buttocks, lower abdomen, and forearms. The rash eventually coalesced, affecting approximately 73% of her body surface area. At first, the patient was thought to have necrotizing fasciitis, as severe desquamation ensued. Drug related rash was also considered, given the sequence and timing of the preceding events. Subsequent work up including a skin biopsy, however, demonstrated histological features consistent with vasculitis, deemed to be highly suggestive of Henoch-Schonlein purpura (HSP).

**Discussion:** Although, in retrospect, the presentation appeared classic, many distracting details of the case, including the red herring of exposure to a topical analgesic, had confounded the definitive diagnosis. Given her history of tobacco exposure, an underlying primary malignancy was of great concern given this sudden onset of HSP. Screening images including CT scans of the chest, abdomen and pelvis revealed pulmonary nodules that had not been present on previous plain radiographs. PET scanning confirmed these same findings. The patient was treated for HSP with corticosteroid therapy and significantly improved. She was directed to outpatient follow up for further work up of a potential underlying malignancy.

**Conclusion:** This case highlights the importance of recognizing adult onset HSP as the initial presentation of a potential underlying malignancy.

## **ABSTRACT 7**

### **Clinical Characterization of a Young Girl with Microdeletion of 1p32.3**

Sanjida Cabot MD, PhD, Patricia Galvin-Parton MD, Berrin Monteleone MD

**Abstract:** Microdeletion of 1p32.3 has been previously uncharacterized from a clinical perspective in children. We describe a 19 month old girl with developmental delay, dysmorphic features, and a karyotype 46XX, who has been found to have del 1p32.3 on microarray. The deletion of this area has been associated with multiple myeloma and other malignancies. With a broad PubMed search we discovered that the dysmorphology of this specific microdeletion had not previously been described in available literature. A similar microdeletion of (1) (p32.1, 32.3) has been reported in only two published cases. Both of these were described and clinically compared in a paper by Zinner and Batanian in the American Journal of Medical Genetics in 2003. Our case report describes the patient encounter in September 2012, systematically compares the patient's clinical features to the two known related cases, and attempts to explore the clinical implications of the associated risk of malignancy in this microdeletion. We found that many physical features of our patient are similar to the del (1) (p32.1, p32.3) cases described in the above literature, however there remain some phenotypic features that remain unique to del 1p32.3.

## ABSTRACT 8

### **Breastfeeding Knowledge, Attitudes and Beliefs: A Survey of Pediatric Residents in a Tertiary Hospital Setting**

Laurie Campfield DO, Lisa Clark DNP, CPNC-AC, PC, Margaret Connolly MD, FAAP

**Background:** Breastfeeding provides many health benefits both for mother and baby, and is strongly supported by the American Academy of Pediatrics (2012). The Center for Disease Control and Prevention reported in the United States for 2012 the rate of breastfeeding initiation at birth was 77%. The rate of exclusive breastfeeding falls to 36% by 3 months of age, and 16% by 6 months of age. Research shows that maternal initiation and continuation of breastfeeding is a complex relationship. Influencing factors identified are the attitudes and support put forth by the health professionals who mothers encounter in the hospital before and after delivery. Exploring breastfeeding knowledge and attitudes is important in order to achieve breastfeeding goals among mothers who wish to breastfeed.

**Objective:** To investigate the relationship between knowledge, attitudes, and beliefs toward breastfeeding among pediatric resident physicians.

**Methods:** A descriptive survey was administered with IRB approval to pediatric residents in training PGY1-PGY4. The survey was adapted with permission from Nurses Support for Breastfeeding Questionnaire by L. Bernaix (2000). The survey consisted of 5 subscales; all formatted using a 5-point Likert-type scale; Breastfeeding Attitudes; Subjective Norms; Motivation to Comply with Normative Beliefs; Behavioral Beliefs; and Knowledge of Breastfeeding. The questionnaires were self-administered and confidential, with a participation rate of 72% (47/65). Data was collected and analyzed for correlations using SPSS.

**Results:** Providing support to breastfeeding mothers was found to be very important (95.7%); extremely necessary (98%); a positive experience (74%). 59% were confident in their ability to support breastfeeding mothers. There was no relationship between residents' total knowledge score (mean score 7.26/15) or completion of an educational program with self-identified confidence in assisting a mother with breast feeding. The survey identified overall limited experience in counseling (42%) and ability to provide maternal support (59.6%). A correlation between experience and attitudes was identified: PGY3-4 resident's reported achieving success in providing support to breastfeeding as more important (66%) than those with less experience PGY1-2 (34%).

**Conclusions:** Overall the residents demonstrated positive attitudes toward breastfeeding. Areas identified for improvement were breast feeding knowledge and experience. A resident's confidence in providing breast feeding support was identified with increased years of training. The development of educational programs need to be directed to ensure accurate and consistent delivery of breastfeeding information and technical support to mothers with targeted experiences to improve the resident's confidence in their interactions with breastfeeding mothers.

## ABSTRACT 9

### Parental Perception of Video Game Use in Adolescents

Claudia Conde MD, Machada Smith, Margaret McGovern MD, PhD

**Background:** Video games are a popular source of entertainment among children and adolescents. Studies have documented that children ages eight to eighteen spend over one hour daily on average playing video games, with a broad range of use. Other investigations have reported negative effects related to video game use including decreased school performance, attention problems, aggressive behavior and potential for addiction. To date, the only studies of parental perceptions and concerns about video game use among their adolescents have been qualitative studies that have used focus groups. In addition, no studies have been reported to date comparing parental perception of video game use with the actual use as reported by their children.

**Objective:** The objective of this study is to compare parental perception of video game use with the child's self-report of actual use.

**Methods:** This is a cross-sectional descriptive study to be conducted over a 12-month period at the Stony Brook Long Island Children's Hospital Pediatric Outpatient Clinics. Subjects recruited to the study included children and adolescents between 11 to 18 years of age who play video games and were accompanied to the visit by a parent or guardian. Written assent from all children and written informed consent from the parents was obtained. Parent-child paired surveys were conducted. These included questions about the type of gaming system used, amount of time spent playing video games, awareness about video game content and the ESRB rating system, concerns about video game use, and others. Two clinics used Survey Monkey as their survey application on tablet computers (iPads) and one clinic performed paper surveys. Descriptive statistics were used to analyze the aggregate responses of the parents and children. After further data collection, statistical analysis to compare the child responses with the parent responses will be accomplished.

**Results:** From 25 paired surveys conducted to date, 96% of parents knew which video games their child plays. The most played video game reported by children was Call of Duty® (M-rated). About 60% of parents were aware of the amount of time their child spends playing video games and how they obtain the video games. 71% of parents were aware of the place where their child usually plays, and 78% knew the amount of video games their child owns. Although 68% of parents reported knowing about the ESRB rating system, 44% do not check video game ratings before allowing their child to play, and 36% do not check content description prior to purchasing the games. 72% of parents reported they have rules at home regarding the amount of time their child can spend playing, while only half of their children reported having rules at home. 36% of parents are concerned about their child's video game use.

**Conclusion:** Preliminary results demonstrate that many parents do not have a correct perception of their child's video game use, and are in need of guidance regarding how to choose appropriate video games for their children and how to set clear rules on the amount of time and content allowed for them.



## ABSTRACT 10

### A 6-year old Boy with an Unusual Presentation of SLE Lupus Erythematosus Tumidus and Systemic Manifestations

Kim Derespina MD, Julie Cherian MD

**Abstract:** Lupus erythematosus tumidus was first described in 1909 by Hoffman et al. when two patients presented with round, erythematous, elevated tumorous lesions on the face without surface changes. It is a variant of chronic cutaneous lupus erythematosus and is rare, especially in children. In fact, the incidence is unknown, and there is no clear gender predominance. Lupus tumidus lesions are characterized by erythematous, succulent, edematous, nonscarring plaques in sun-exposed areas. Histologic examination shows perivascular and periadnexal lymphocytic infiltration and interstitial mucin deposition. Unlike other forms of cutaneous lupus, there is no epidermal involvement. It may be associated with areas of alopecia, which are typically responsive to antimalarial treatment.

Many cases have been reported in the literature in adults, and the mean age of onset is 36.4 years. At a young age, however, chronic cutaneous lupus is uncommon, and few cases have been reported. We describe an unusual case of a 6-year-old Hispanic male who presented with rash, located on the cheeks and ears, worsened by exposure to sunlight, fever, swollen cheeks, difficulty swallowing, and alopecia. Our patient was found to have multiple antibodies positive, including anti-double stranded DNA, anti-Ro, anti-Sm, anti-RNP, and anticardiolipin IgG and IgM. Based on clinical presentation, laboratory findings, and skin biopsy results, our patient was diagnosed with lupus erythematosus tumidus. Unlike prior case reports in children, our patient presented with systemic systems. In addition, our patient presented with parotitis and Macrophage Activation Syndrome, neither of which have been previously reported in pediatric patients with lupus erythematosus tumidus.

## ABSTRACT 11

### **Knowledge Assessment of Caregivers of Young Soccer Players regarding Sports-Related Concussion**

Margaret Dyer MD, A. Cantville, M. Joseph, C. Kalynych, C. Smotherman, D. Kraemer

**Purpose of Study:** Much of the media and medical community attention on sports-related concussion has been focused on athletes at the professional, collegiate, and more recently high school levels. To our knowledge, there is a paucity of research regarding parental understanding of concussion in children and its potential consequences. The aim of this study was to evaluate parental knowledge of concussion in young children who participate in recreational soccer.

**Methods Used:** Parents of children aged 4-17 years enrolled in recreational soccer were asked to complete an anonymous survey (23 questions) based on the CDC's "Heads Up: Concussion in Youth Sports" quiz. Parents were asked about their level of agreement in regard to statements representing the definition, symptoms, treatment of concussion as well as the source of information.

**Summary of Results:** A total of 354 out of 360 parents completed the questionnaire (98% response rate). Eighty-four percent were white, more than half (63%) were female, and most respondents (96%) had more than a high school education. Forty-six percent of the children were aged between 8-10 years; 23% between 5-7 years, and 26% between 11-13 years. Ninety-two percent of parents believed their child had never suffered a concussion. However, only 15% (n=55) could correctly identify all 7 statements addressing various aspects of concussion. Most did not identify that a concussion is considered a mild traumatic brain injury and nearly 40% did not identify that a concussion can be achieved from something other than a direct blow to the head. Fifty-two percent of parents reported someone had discussed the definition of concussion with them and 61% the symptoms of concussion; with less information provided by their healthcare provider (35% and 42% respectively). Of interest, caregivers receiving education about concussion from the internet did better at identifying the correct concussion statements compared to those who received it from other sources ( $p < .001$ ).

**Conclusions:** While most parents of soccer players received some education regarding concussion from various resources, important misconceptions remain regarding the definition, symptoms, and treatment of concussion. This study highlights the need for healthcare providers to increase educational efforts among parents of young athletes regarding concussion.

## ABSTRACT 12

### **Netti Pot, Netti Not: Septic Thromboembolic Phenomenon in a Patient linked to chronic Netti Pot Use**

Gagandeep Gill MD, Charles Miller MD, Alpa Desai MD

**Background:** Cavernous venous sinus thrombosis (CVST) is a rare condition that has been associated with many different etiologies, and a highly variable clinical presentation. The presentation of septic CVST depends on the etiology and venous space being affected. Thromboses often occur in the vasculature that is anatomically adjacent to an infected tissue. There are only 6-8 cases reported about Netti-Pot use and its link to amoeba infections. We report a 61 year old female who presented with a four day history of bilateral temporal headache, blurry vision, nausea, emesis and fevers with a diagnosis of sinusitis, several subdural pus collections and a large cerebral venous sinus thrombosis.

**Objective:** This case of a patient with a complex ICU course is being reviewed for its rare etiology, treatment modality and outcome.

**Method:** The patient's medical record was analyzed including all radiology and subspecialty recommendations.

**Results:** Our patient presented with progressive neurological and cardiovascular symptoms requiring intravenous anticoagulation, prolonged antibiotic treatment, neurosurgical intervention and ICU level care. Further investigation of the history in this patient led us to the etiology of improper, chronic sinus wash use. This patient's care and treatment were based on multiple imaging studies as well as microbiology results from blood, CSF and faucet water. After undergoing treatment (surgical and medical) our patient's neurological status returned to baseline and she was successfully discharged home.

**Conclusions:** While our patient's clinical presentation was typical of cavernous sinus thrombosis, improper sinus wash use is a rare etiology. Prior published case reports of sinus wash use have been linked to amoebic infections. This case is unprecedented in that it links improper sinus wash use to bacterial meningitis and brain empyema formation. The clinical decisions for management of cavernous sinus thrombosis secondary to bacterial sinusitis depend on empiric treatment of pathogens and understanding of etiology. Our patient's case opens the eyes of providers to this relatively new possible source of infection. Due to its increasing popularity in the outpatient setting having a proper understand of sinus wash techniques is relevant to medical practice.

## ABSTRACT 13

### **The Effect of an Electronic Medical Record on Turnaround Times of Physician Documentation in an Out-Patient Clinical Setting**

Caitlin Heyden MD, Catherine Messine PhD, Rahul Panesar MD

**Background:** The Electronic Medical Record (EMR) has been implemented to improve quality, safety and efficiency at a growing number of health care institutions. Published data has shown the effects of EMR on safety and its prevention of medical errors in hospitalized patients. However there is minimal data examining the ability of the EMR to enhance efficiency in the out-patient subspecialty setting. Specifically, how the EMR can change the timeliness of subspecialty reporting to a primary care provider (PCP) and the cost benefit of such a system warrants closer evaluation. At Stony Brook Long Island Children's Hospital, the Pediatric Department implemented the EMR in March 2011 and Pediatric Cardiology was the first subspecialty to "go-live" with the EMR in the out-patient setting.

**Objective:** We aimed to quantify differences in the turnaround time of consultant letters from the pediatric cardiology clinic visits before and after implementing the EMR. Specifically, we examined the time and cost of producing and delivering these documents to the PCP.

**Methods:** Data from patient visits were obtained from two pediatric cardiologists' outpatient panels in a month pre-EMR, in December 2011, and six months post-EMR, in June 2012. Cardiologist A had a sample size of 108 patients in December and a sample size of 78 patients in June. Cardiologist B had a sample size of 75 patients in December and a sample size of 64 patients in June. We calculated the time required to finalize a consult letter, starting from the time of the clinic visit. We also examined the time from when the letter was completed to when it was delivered to the referring PCP, either by postal mail or fax. T-test analysis was utilized to analyze the averages of time intervals with a p-value of 0.05 to be considered statistically significant.

**Results:** In the pre-EMR period, the average number of days for letters to be finalized for Cardiologist A pre EMR was 8.6, and 13.2 for Cardiologist B ( $p < 0.001$ ). In the post-EMR period, the average number of days for letters to be finalized for Cardiologist A was 1.27 days and 5.31 days for Cardiologist B ( $p < 0.001$ ). In the pre-EMR period, the average number of days for letters to be mailed to the PCP for Cardiologist A was 1.88 and 1.41 for Cardiologist B ( $p < 0.001$ ). In the post-EMR period, the average number of days for letters to be mailed to the PCP for Cardiologist A was 0.64 and 0.27 for Cardiologist B ( $p < 0.001$ ).

**Conclusions:** This study demonstrated that implementation of EMR in an outpatient pediatric cardiology setting is associated with a statistically significant decrease in the time frame for a PCP to receive a completed consultant letter as well as substantial cost savings.

## ABSTRACT 14

### **Concussion Aftercare Instructions from the Pediatric Emergency Department: A Quality Improvement Project**

Katherine Huston MD, Carl Kaplan MD

**Background:** The current literature on sports-related concussions in children and adolescents emphasizes the need to rest, both cognitively and physically, until symptoms are resolved both at rest and with exertion. Excessive demand on the brain from physical or cognitive activity prior to complete resolution of symptoms has been associated with prolonged recovery time from concussion, and young athletes seem to be particularly vulnerable to devastating brain injury should another head impact occur during the recovery phase of a concussion.

**Objectives:** The aim of this project was to assess and improve compliance with instructing pediatric patients with concussion to limit activity and obtain clearance from a physician prior to resuming sports or other physical activity, in accordance with current guidelines. Our goal was a compliance rate of 90% or greater.

**Methods:** All cases presenting to the Pediatric Emergency Department at Stony Brook University Hospital that received a diagnosis of head injury, concussion, or post-concussive syndrome (ICD-9 codes 850.5-.11,850.0,959.01,310.2) over a 7-month period were reviewed for documentation of patient instruction to abstain from physical activity until cleared by a physician. Patients younger than 6 years old and patients diagnosed with “head injury” whose cases did not meet diagnostic criteria for concussion were excluded. Over the 7-month study period, baseline data was collected, and four interventions were performed to improve compliance with appropriate discharge instructions. These included (1) the creation of an instructional sheet to give to parents; (2) the addition of the instructions to the electronic depart process; (3) review of concussion aftercare instructions at an attending divisional meeting; (4) instructional lecture to pediatric residents about concussion and appropriate aftercare instructions. The compliance rate with appropriate aftercare instructions was calculated following each intervention.

**Results:** The baseline compliance rate with documentation of instructions to abstain from physical activity until cleared by a physician was 51%. The rates following Interventions 1, 2, 3, and 4, were 39%, 46%, 75%, and 93%, respectively.

**Conclusions:** The interventions succeeded in achieving goal compliance rates above 90%. The greatest increases in compliance were observed following verbal education of medical providers in the Pediatric Emergency Department, emphasizing the importance of education as part of quality improvement initiatives.

## ABSTRACT 15

### The Effects of High Weight-for-Length on Development in Infants

Amrik Singh Khalsa MD, Amy Braksmajer MPH, Rose Calitxe PhD, Susmita Pati MD, MPH,  
Rosa Cataldo DO

**Background:** The increasing prevalence of childhood obesity has raised several public health concerns including recent evidence that it has effects on early child development, although few studies have examined the relationship between physical growth parameters and developmental outcomes among children younger than five.

**Objective:** As a cohort of a larger project, we conducted a secondary analysis of the Early Childhood Longitudinal Study birth cohort (ECLS-B) data particularly looking at weight status using weight-for-length percentiles and analyzing developmental outcomes, specifically cognitive (mental) and motor development to determine if there is a correlation between weight status.

**Design/Methods:** We analyzed data obtained from ECLS-B, a longitudinal study of a nationally representative sample of approximately 10,700 children born in 2001. We used logistic regression modeling to look at the weight status of the 9 month old cohort along with covariates including birth weight, sex, race, among others to analyze their developmental outcomes using a modified Bayley developmental screen, Bayley Short Form Research (BSFR). Standardized T-Scores (standard mean 50, standard deviation 10) were used to create a composite score compiling a separate motor and mental score from several individual milestones. We specifically looked at developmental outcomes 1.5 standard deviations away from the mean as a marker for motor or mental developmental delay.

**Results:** Results show that for 9 month old infants, there was statistically significant correlation between weight-for-length and motor development delay in infants in those >85th percentile for weight-for-length (OR ratio 0.75, 95% CI: 0.52-0.96), infants >90<sup>th</sup> percentile for weight-for-length (OR ratio 0.70, 95% CI: 0.56-0.93), and in infants >95<sup>th</sup> percentile for weight-for-length (OR ratio 0.68, 95% CI: 0.5-0.92). There was no significant correlation between weight-for-length and mental development at 9 months age.

#### **Conclusions:**

Based on the findings, it appears that higher weight-for-length percentiles are correlated with motor development outcomes that are 1.5 standard deviations from the norm. There was no association between weight for length and mental development outcomes for children 9 months of age.

## ABSTRACT 16

### A Developmental Model of Physician Empathy and Compassionate Care: Implications for Medical Education

Lauren Ng DO, Janet E. Fischel PhD, Stephen Post, PhD

**Abstract:** Clinical empathy is the ability to interact and understand a patient's feelings and experiences. This is especially important in the development of medical trainees. Clinician experiences, role-modeling and training curricula may all contribute to the development of physician empathy and ultimately compassionate care.

The authors propose a developmental model of empathy and compassionate care, and examine what might influence or deter growth through the stages in this model. This model includes individual steps that lead a medical professional from empathy associated with 'routine' care to cognitive empathic care to affective empathic care to compassionate care, viewed in this model as an intensification of both cognitive and affective empathic care under the circumstances of suffering. These steps include: 1) *routine care* involving basic capabilities related to caring for patients; 2) *detached empathy*, the ability to actively communicate and understand patient experiences; 3) *emotional empathy*, the ability to emotionally attune to the patient's feelings; and 4) *compassionate care*, a cognitive and emotional empathy in the context of patient suffering.

The training and professional careers of physicians potentially include both barriers and experiences that facilitate the achievement of the steps proposed. Here, the authors identify inhibitory influences in conjunction with the proposed developmental model. Additionally, implications for ways to cultivate the development of empathy and the progression to compassionate care in medical professionals are discussed with the use of the Jefferson Scale of Empathy and the consideration of teaching methods within undergraduate and graduate medical education.

## ABSTRACT 17

### The Effects of a High BMI on Development in Toddlers

Ebrahim Oomerjee MD, Rose Calitxe PhD, Amy Braksmajer, Susmita Pati MD, MPH, Rosa Cataldo DO

**Background:** Childhood obesity is clearly associated with increased risk of future chronic medical problems. Although a number of factors are known to affect early child development, few studies have examined the relationship between high Body Mass Index (BMI) and developmental outcomes among toddlers.

**Objective:** To determine the relationship of BMI with achievement of gross motor development (GMD) in toddlers 2 years of age.

**Design/Methods:** This is a secondary data analysis using the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a nationally representative cohort of 10,700 children born in 2001. The key explanatory variable is BMI  $\geq$  90% at 2 years of age. GMD at 2 years of age was assessed using the Bayley Short Form-Research Edition (BSF-R). Standardized T-scores ( $\mu=50$ ,  $\sigma=10$ ) were used to evaluate the composite gross motor skill. The association between a high BMI and GMD was assessed using logistic regression (unadjusted data).

**Results:** Children included in the full ECLS-B 2 year sample (n=9835) were predominantly White, non-Hispanic (41%), 16% African American, 20% Hispanic, and 23% other. The majority of households had incomes  $\geq$  100% poverty threshold (72%), and most families were dual-parent (67%). Compared to normal weight toddlers, the overweight group was more likely to have GMD. GMD was also found to be associated with those that fell below the poverty threshold (<100% poverty level). Compared to the non-Hispanic White toddlers, the African American, Hispanic, and Asian toddlers, were all more likely to have GMD. Lastly, GMD was found to be more prevalent in toddlers with reported health problems, and those who were in regular non-relative care.

**Conclusion:** Among toddlers, high BMI negatively influences gross motor development. Novel interventions to address toddler BMI are needed to ameliorate poor developmental outcomes in children.



## ABSTRACT 18

### A Novel Presentation of Chlamydia Trachomatis Infection in a Young Male: Case Report

Crystal Sachdeva MD, Roderick Go DO

**Background:** Chlamydia trachomatis infection is global in distribution, with more than 89 million cases worldwide. It is also the most commonly reported infection in the United States. Sequelae of the disease have a great medical and economic impact with projected costs of \$2.4 billion to U.S. health care annually. These statistics are based on case reporting and have been used to implement screening programs for high-risk populations. While urethritis and dysuria (disease of the lower urinary system) are typical, it is of interest to report novel presentations to further contribute to the body of information regarding chlamydia.

**Objective:** We submit an atypical case of chlamydial trachomatis infection consistent with disease of the upper urinary tract in a male and review the literature on such presentations.

**Design/ Method:** A 25-year-old male, with history of nephrolithiasis and ureteral stent, presented with renal colic. After extensive evaluation, the source of pain remained indeterminate and unlikely due to nephrolithiasis. He continued to have excruciating back and flank pain of unclear etiology and was maintained on a pain regimen for symptomatic relief. Although there was no evidence of urethritis initially, the patient developed dysuria one-month from onset of symptoms and was found to have chlamydia via polymerase chain reaction testing. Resolution of symptoms was achieved after treatment with doxycycline.

**Results:** After literature review, we believe this to be a novel case of genitourinary chlamydia with symptoms mimicking renal colic. A contributing factor to this patient's presentation may be his history of instrumentation associated with the ureteral stent. Cases of atypical chlamydial infections leading to unnecessary medical interventions have been documented. The implication of this unconventional presentation was prolonged hospitalization with extensive work-up including several consultant evaluations. The patient was also started on opiates without clear explanation for his pain putting him at risk for future chronic medication dependence, continued disease transmission, and propagation of associated sequelae to sexual partners.

**Conclusions:** Our case is a unique and undocumented presentation of chlamydial trachomatis. As per the United States Preventive Services Task Force, there are no guideline recommendations for screening males. This case illustrates testing for chlamydia should be considered when abdominal pain or genitourinary symptoms of unclear etiology are present. Testing is strongly recommended because diagnosis may have important public health implications, such as the need for partner referral or for possible revision of screening programs.

## ABSTRACT 19

### Early Discontinuation Patterns of Hormonal Contraception in Adolescent Females

Alexis Santiago MD, Allison Eliscu MD, Catherine Messina PhD

**Background:** It is estimated that 1 in 5 adolescent girls in the United States become pregnant, 82% of which are unplanned. Adherence to a contraceptive method is essential to prevent teen pregnancy. Oral contraceptive pills (OCPs) continue to be the form of hormonal contraception most commonly used by adolescents, but studies have demonstrated poor compliance and continuation rates with this method. Newer methods of hormonal contraception exist, having the potential to improve compliance rates. There have been many studies examining newer options for contraception and continuation rates of contraception. However, there is much more data on continuation rates in older females, and clinical studies which examine continuation tend to exclude adolescents.

**Objective:** The objective of this research is to complete a descriptive study examining the discontinuation rates of adolescents initiating either OCPs, Depo Provera or the vaginal ring in a 6 month period. Based on these findings, we would like to determine factors that lead to improved adherence in the adolescent population we are serving in our community.

**Methods:** This study employed an anonymous retrospective chart review. Inclusion criteria for the study included medical record data obtained from females age 14 to 24 who were initiating hormonal contraception either in the form of OCPs, Depo Provera, or the vaginal ring (who have been seen at Stony Brook University Hospital's adolescent clinics during January 2010-December 2011). Eligible patients had to be using the contraception for the purpose of pregnancy prevention. Demographic features obtained from the chart included age, initiation of contraception, and follow up at six months. Side effects from the method of contraception were noted as well as reason for discontinuation.

**Results:** A total of 93 charts were reviewed; 44 patients fulfilled the eligibility criteria. OCPs were the most commonly prescribed (72.7%) followed by Depo Provera (15.9%), then the vaginal ring (11.4%). OCPs had the best continuation rate with 86.7% of users continuing at 6 months. Depo Provera had the greatest discontinuation rate (42.9%). The most common documented reasons for Depo Provera discontinuation included irregular menses and breakthrough vaginal bleeding. There was no association between age and increased discontinuation rate. In participants age 17 and younger, 87.5% continued their method of contraception compared to 70.6% in the 18 or older age group; however this difference was not statistically significant ( $p=.178$ ).

**Conclusions:** OCPs had better continuation rates compared to newer methods. Providers should provide detailed anticipatory guidance to new contraceptive users detailing possible side effects which may occur. This counseling may improve method continuation and subsequently decrease unintended pregnancy rates in this population.

## ABSTRACT 20

### Review Article on Asthma in Infancy and Early Childhood

Hetti Wickramasinghe MD, Catherine Kier MD, FAAP

**Background:** Asthma is the most common chronic disease in children, affecting about 5 million children in the United States nearly a million of them are under five years of age. Management of asthma in infants and young children had been extrapolated from available data in older children and adults. A diagnosis of asthma in the 0-4 year age group was difficult because similar symptoms are seen in diagnoses such as gastro-esophageal reflux, cystic fibrosis and upper airway inflammation. There is still some parental reluctance to accept the diagnosis of asthma and most primary care physicians are uncomfortable with using “asthma” as a diagnosis. The National Institutes of Health (NIH) recognized this gap of knowledge and recently, multiple large cohort research studies have been funded to address the diagnosis and management of asthma in young children.

**Objective:** To review relevant publications related to recent asthma research in infants and young children and to provide a concise but rich summary to asthma care providers who will be able to apply this information to their clinical practice.

**Methods:** A systematic literature review was done using Medline (Ovid) search. The key words used were “asthma”, “children” and “infants”. Limits used were English language only, humans, and time frame from 2000 to 2012 (last 12 years). There were a total of 3727 hits and 115 articles were reviewed. An outline of the article was developed and the manuscript was written and presented in an organized fashion.

**Results:** The following recommendations are made: (1) Based on risk factors and presentation of wheezing episodes, children can be categorized into different asthma phenotypes; (2) Asthma predictive indices will allow us to identify children who are at high risk of developing persistent wheezing; (3) Genetic and environmental factors have been identified as either risk or protective factors in the development of asthma; (4) Expert Review Panel 3 (EPR-3) and Global Initiative for Asthma (GINA) guidelines are two most recent asthma guidelines with emphasis on asthma management on the younger age group (age 0 to 4 years); (5) Inhaled corticosteroid is preferred controller medication in the younger age group; (6) Management of asthma in the young is complicated by issues with adherence and phobias of long term steroid use.

**Conclusion:** Recent research on asthma in the younger age group provided new knowledge that became the framework for asthma management guidelines for the younger population. Asthma care providers will be more informed and be able to actively participate in the prevention and treatment strategies for asthma in young children.

## ABSTRACT 21

### **Keeping Families Healthy: Caregiver Perception, Diet, and Exercise among Overweight and Obese Young Children Enrolled in a Home Visitation Program**

Jason Lai, Janice T John DO, MS, MPH, Kristi L Ladowski MPH, and Susmita Pati MD, MPH

**Background:** Despite increasing prevalence, overweight and obesity in young children remain underdiagnosed by primary care providers. Additionally, caregivers may not understand the long-term implications of overweight or obesity in early childhood. Keeping Families Healthy is a home visitation program that provides health education to children and their families. Few home visitation programs target overweight/obese children. Therefore, there is scant literature on caregiver perceptions or diet and exercise habits of overweight and obese young children enrolled in home visitation programs.

**Objective:** The purpose of this study is to characterize the caregiver perceptions and lifestyles of overweight and obese young children enrolled in Keeping Families Healthy, and to compare their demographics with other children in the program.

**Design/Methods:** We retrospectively examined the questionnaires and home visit records of children (N=122) aged 2 through 6 enrolled in the Keeping Families Healthy program. Data were collected at enrollment and at children's homes by trained community health workers using tablet computers with REDCap access. Overweight was defined as BMI-for-age percentile  $\geq 85\%$  and  $< 95\%$ , and obese was defined as BMI-for-age  $\geq 95\%$ . Data points were tabulated using Microsoft Excel.

**Results:** Of 122 children, 24 (20%) were overweight and 28 (23%) were obese. Of this KFH cohort, mean age at enrollment was 4.4 years, 66 % were Hispanic, 81 % received Medicaid and 53% had an annual household income under \$20,000. At enrollment, none of the overweight and 3 (11%) obese children were identified by their caregiver as being overweight. At the initial visit, 50% of overweight and 67% of obese children had caregivers that rated their health as "very good" or "excellent". 77% of overweight and obese children reported consuming sugary foods and drinks, and both groups reported a median of 2 hours spent in front of an electronic screen each day.

**Conclusions:** The vast majority of overweight and obese young children are misidentified by their caregivers as being of healthy weight. Additionally, the diet and exercise habits of overweight and obese young children reflect known risk factors. This study supports the importance of screening young children for overweight and obesity in home visitation programs. Future research should explore the potential benefit of home visits in the early childhood overweight population.

## ABSTRACT 22

### **Keeping Families Healthy: A Look at the Demographic Profile of the Intervention Group**

Heena Shukla, Janice T John DO, MS, MPH, Kristi L Ladowski MPH, and Susmita Pati MD, MPH

**Background:** Keeping Families Healthy (KFH) is an outreach service which gives families “at risk” the resources, information and support they need to make informed choices for their children’s healthcare. The program serves mostly younger children. Analyzing demographic variables in this study population serves to (1) offer an objective look at participants and (2) speak to the generalizability of the study results.

**Objective:** To examine the demographic variables of the intervention group such as: age, gender, medical conditions, race/ethnicity, income, and insurance type of those in the intervention group. In addition, to describe programmatic details such as the number of home visits children received and protocol distribution.

**Design/methods:** 338 children have received at least one visit from a Community Health Worker (CHW) and consented to participate in research evaluating the program effectiveness. The demographic data of these children and their families were collected from the children’s contact information form and a psychosocial screening questionnaire filled out by their parents. Data was also obtained from CHW records of the children’s home visits. The data was entered into a Microsoft Excel spreadsheet and percentages for the demographic variables were calculated.

**Results:** Of the study population (n=338), 50.6% of patients in the intervention group were male and the mean age in this cohort was 5.2 years. The race/ethnicity profile was 51.2% Hispanic, 20.7% White, 13.9% African American, 9.5% reported as “Other” and 4.7% gave no response. When asked about annual income, 24.0% of families reported an income below \$20,000 a year, 27.2% reported an income above \$20,000 and 48.8% of families chose not to report their income. Additionally, 77.2% of children were enrolled in public health insurance (Medicaid) programs. At program enrollment, children were assigned a specific protocol: 35.8% had a chronic medical condition, 41.1% were “healthy,” and 23.1% were newborns. On average children received 3.3 home visits; 44.7% of the patients had 1-2 visits, 38.1% had 2-4 visits, 12.3% had 4-6 visits, and 4.8% had more than 6 home visits.

**Conclusions:** Results revealed that most of the participants in the intervention group were Hispanic and came from families with low income. Moreover, slightly less than half of participants were healthy (“no known condition”). The demographic breakdown of the intervention group gave better insight into the types of families that are enrolling in this home visitation program. These results will aid in future home visitation program planning.

## ABSTRACT 23

### **Increasing Prevalence of Overweight and Obese Children at Time of Diagnosis of Celiac Disease**

Rebecca Abell, DO, Kim Derespina, MD, Catherine Messina, PhD, and Anupama Chawla, MD

**Background:** Celiac disease can present with a variety of manifestations, especially in the pediatric population. Typically, children with celiac disease are thought to be underweight, anemic, and suffering from abdominal pain and diarrhea. The current rate of obesity in children 2 to 19 years of age is 17%, according to the Center for Disease Control. Two recent studies have reported that 5-6% of children diagnosed with celiac disease were obese (BMI >95%) at the time of diagnosis. Prior to these studies, there have only been case reports of obesity and celiac disease in the pediatric population. As the rate of childhood obesity in this country continues to increase, it is important not to exclude obese children from celiac screening.

**Objective:** To show that there is an increased prevalence of obesity in pediatric patients diagnosed with celiac disease than previously believed and to specifically look at the symptom profile in this population group.

**Study Design/Methods:** This is a retrospective study of 96 pediatric patients diagnosed with celiac disease between 2006 and 2012 at Stony Brook Children's Hospital. Data collected from the medical records included age, sex, weight, height, and BMI at time of diagnosis, presenting symptoms (including abdominal pain, diarrhea, and constipation), follow-up weight, height, and BMI one to two years after diagnosis. Patients were subdivided into underweight, normal weight, overweight, or obese, based on BMI percentiles as defined by the Center for Disease Control.

**Results:** Five (5.2%) patients were underweight, 65 (67.7%) were normal weight, 13 (13.5%) were overweight, and 13 (13.5%) were obese. Overweight and obese patients (42.3%) had a significantly higher rate of constipation compared to the normal weight patients (18.8%) as well as the general obese pediatric population (23%).

**Conclusions:** Our study has demonstrated an even higher prevalence of obesity at the time of diagnosis of celiac disease than prior studies. In fact, we have demonstrated a prevalence of obesity in celiac disease patients that is nearing the national level. The incidence of constipation in this subgroup far surpassed the incidence in normal weight celiac patients and that reported in the general obese pediatric population, making celiac disease the likely etiology of constipation rather than obesity. By demonstrating that there is an increased prevalence of obesity among newly diagnosed celiac patients, this should encourage clinicians to think more seriously about screening obese children with abdominal pain, diarrhea and especially constipation. By not screening these children we are delaying diagnosis and thus treatment of a life-long disease.

## ABSTRACT 24

### Childhood Cancer Syndrome: A new type of Lynch Syndrome with Café-au-lait spots

Nisida Berberi MD, Sameer Lapsia MD, Devina Prakash MD

**Background:** Lynch syndrome is an autosomal dominant genetic defect that impairs DNA mismatch repair causing colon cancer and has high incidence with ovarian, endometrial, small intestine, upper urinary tract, brain, skin cancer. Mutations are seen in MLH1, MSH2, MSH6, PMS2 genes. Biallelic mutations in these genes have shown development of childhood cancers, including hematological malignancies, brain tumors, which are not typical of Lynch Syndrome. These patients also are found to have café-au-lait spots and often have had work up for Neurofibromatosis 1. This syndrome is called childhood cancer syndrome and most of the cases are seen in consanguineous relationships.

**Objective:** We report a case of a child with café-au-lait spots where parents were not related but both have the PMS2 gene mutation in one of the alleles.

**Case:** 14 year old female presented with a 2 day history of abdominal pain radiating to the back. Review of systems was negative except for recent hesitancy with urination. There was no prior history of abdominal pain, hematochezia, or weight loss. The patient had a history of café au lait spots, but work-up for neurofibromatosis had been negative. Family history was significant for malignancy including a 5 year old sibling, deceased of T cell non-Hodgkins Lymphoma, who was also noted to have café-au-lait spots, mom with history of melanoma, and maternal grandfather deceased of colon cancer at 42 years old. The paternal side of the family was also significant for colon and breast cancer in a grandmother and aunt. CT of abdomen revealed obstructing central soft tissue mass in the left kidney and a soft tissue mass was also seen in the descending colon with similar attenuation to the renal soft tissue mass. Based on pathology, the masses were determined to be two primary carcinomas. Patient showed deletion of PMS2 in both alleles and presented with multiple adenocarcinoma and transitional cell carcinoma. Patient was diagnosed with Stage IV glioblastoma multiforme after 9 months of initial presentation after mass noted on surveillance MRI.

**Conclusion:** A diagnosis of childhood cancer syndrome should be considered in patients with the following features: 1. Café-au-lait spot and/or other signs of NF-1 and/or hypo-pigmented skin lesions. 2. Consanguineous parents 3. Family history of Lynch Syndrome-associated tumors 4. Second malignancy 5. Sibling with childhood cancer. Due to a wide spectrum of malignancies, there are no established guidelines for surveillance. However, we recommend close monitoring via imaging modalities not associated with radiation such as MRIs, a multidisciplinary approach, and genetic counseling in all family members. Our patient has scheduled MRIs every 3 months, cystoscopy every 3 months, and endoscopies every 6 months.

## ABSTRACT 25

### Healthcare Utilization in Obese Children

Josette Bianchi-Hayes MD, Rose Calixte PhD, Rosa Cataldo DO, MPH, Susmita Pati MD, MPH

**Background:** Childhood obesity is a national epidemic with multiple associated co-morbidities. Though increased health care utilization among obese adults is well-established, there is less clear evidence in pediatric populations.

**Objective:** To determine if there is a difference between healthcare utilization in obese, overweight and non-obese children using a large, nationally representative sample of 17,490 children in the NHANES dataset from 2001-2010

**Study Design/Methods:** This project is a secondary analysis of the combined 2001-2010 NHANES or National Health and Nutrition Examination Survey dataset. The NHANES assesses the health and nutritional status of adults and children in the US through a combination of questionnaires, physical exam and laboratory data. Based on CDC parameters, obesity is defined as BMI at or above the 95th percentile for children of the same age and sex and overweight is defined as BMI between 85<sup>th</sup> and 95<sup>th</sup> percentile for children of the same age and sex. The primary outcomes of interest are number of hospitalizations, site for routine preventive care (private office, emergency room, community health center, none), mental health visits, and total number of healthcare visits. Other variables include child age, gender, race/ethnicity, health insurance status, household income, birth weight, chronic illness, and education level of head of household. Analyses were performed using SAS-callable SUDAAN because NHANES uses a complex, multistage, probability sampling design.

**Results:** The study sample consists of 17,490 children (unweighted) ages 2-18 years sampled in NHANES 2001-2010. Of these, 17.76% were obese, 15.09% were overweight, and 67.20% were normal weight. Unadjusted analyses show that obese and overweight children were 1.88 (95%CI 1.24-2.85) times and 1.95(95%CI 1.21-3.12) times more likely, respectively, than normal weight children to receive routine care from the emergency room. There was no significant difference between overnight hospitalizations and number of healthcare visits per year between obese, overweight, and normal weight children. Further analyses will adjust for demographics, chronic illnesses, and birth weight.

**Conclusions:** Obese and overweight patients are more likely to use the emergency room than a clinic or outpatient office for routine medical care. Targeted efforts to create medical homes for these patients merit consideration.



## ABSTRACT 26

### **Does Hypoxia Evoke Enkephalin Release from Chromaffin Cells? Investigating a Novel Stress-Response to Acute Hypoxia**

Alexa Calero MD, Marian Evinger PhD

**Background:** Oxygen deprivation is a significant cause of neonatal morbidity and mortality. Prior to maturation of the sympathetic nervous system, the adrenal medulla is largely responsible for sensing hypoxia. Accordingly, hypoxia evokes massive catecholamine release from this tissue. However, although the adrenal medulla synthesizes considerable quantities of opioid peptides, notably enkephalins, we do not know whether acute hypoxia likewise accelerates release of enkephalins from chromaffin cells as it does in the central nervous system.

**Objective:** Determine whether acute reduction in oxygen concentrations [O<sub>2</sub>] stimulates synthesis and release of enkephalin.

**Study Design/ Methods:** Mouse pheochromocytoma cells (MPC10/9/96 line) provide a model system to investigate hypoxia-evoked enkephalin synthesis and release. Synthesis of pre-pro-enkephalin (pENK) mRNA is examined by RT-PCR using published primer sequences on cDNA templates synthesized from MPC total RNA. A mouse Met-enkephalin ELISA is employed to measure enkephalin cellular content and release. MPCs are subjected to reduced oxygen by incubation in a Billups-Rothenberg chamber at [O<sub>2</sub>] of 21% (normoxia), 10% (hypoxia) and 0% (anoxia).

**Experimental Results:** Reduced oxygen concentrations stimulate enkephalin gene expression. Exposure to hypoxia and anoxia rapidly and robustly promote pENK mRNA synthesis. When MPCs were incubated for intervals (0, 15, 30, 45 and 60 min) to determine timing of maximal response to reduced [O<sub>2</sub>], pENK mRNA increased for at least 1 hour following exposure to hypoxia.

Reduced [O<sub>2</sub>] also stimulates enkephalin peptide (ENK) production. Cellular content of ENK increases up to 75% following 30 minutes of exposure to hypoxia and to 20% after 30 minutes exposure to anoxia. Hypoxia also markedly enhances secretion of ENK: 45 minutes of hypoxia evokes a 30 % increase in ENK secreted into media.

**Conclusions:** Acute hypoxia is a strong stimulus for release of enkephalin from MPC cells, and therefore from adrenal chromaffin cells. Hypoxia-evoked enkephalin release is likewise accompanied by stimulation of pre-pro-enkephalin gene expression and enhanced translation of enkephalin peptide. Clinical implications of these results establish that, in addition to a large catecholamine release, acute hypoxia initiates significant release of enkephalin opioid peptides from chromaffin cells. In the neonate, these enkephalins could affect either reflex mechanisms regulating heart rate during hypotensive episodes frequently encountered in asphyxiated neonates or directly influence electrical and/or mechanical regulation of normal cardiac contractility.

## ABSTRACT 27

### The Effect of Food Additives and Bacterial Antigens on Intestinal Epithelial Cells

Michelle Edelman MD, Grace Gathungu MD

**Introduction:** Studies are examining the effects of environmental triggers on patients with inflammatory bowel disease (IBD). Food, the most common luminal antigen, causes intestinal inflammation via multiple modalities. With an increase in food additive use, there is concern of detrimental effects to intestinal epithelial cells (IEC). Two food additives, allura red (AR) and potassium bromate (KBrO<sub>3</sub>) have been studied. McDorman et al showed chlorinated surface water with KBrO<sub>3</sub> increases colonic crypts and preneoplastic lesions in rats. Exposure of AR causes colonic DNA damage after 3hrs in mice. Preliminary data showed AR (p=0.0001) and KBrO<sub>3</sub> (p=0.0065) caused a rapid decrease in cell proliferation on co-cultured cells after 24hrs. IL-6 and IL-8 cytokine levels were significantly increased in AR treated cells (p<0.01). Claudin-4 expression was decreased showing that the membrane integrity was compromised with AR treatment. Cyclin-A expression was also decreased while p27/Kip1 expression was increased, suggesting inhibition of cell cycle progression. Further effects on IEC when exposed to AR and KBrO<sub>3</sub> needs to be further examined.

**Objective:** IEC are impaired when exposed to food additives (AR and KBrO<sub>3</sub>). This effect is enhanced when lipopolysaccharide (LPS), a bacterial antigen, is added. The aims of our hypothesis are: demonstrate alteration of IEC with exposure to KBrO<sub>3</sub> or AR +/-LPS by examining cellular polarity, proliferation, permeability and injury. The 2<sup>nd</sup> aim: identify the effect of food additives +/-LPS on proteins of the intestinal epithelial barrier.

**Methods:** Caco2&HT29 cell lines will be co-cultured. Cells are treated with AR or KBr +/-LPS. The polarity of the cell is measured via transepithelial electrical resistance. Cellular proliferation is measured by spectrophotometry after treatment with alamarblue reagent. Cellular permeability is measured by spectrophotometry after Lucifer yellow reagent treatment. Cellular damage is determined by the amount of LDH enzyme measured. IL-6 and IL-8 cytokine levels are measured by ELISA. Proteins ZO-1, sucrose isomaltase, cyclin A, p27/Kip1, and claudin4 are examined by confocal microscopy and immunofluorescence. Real time PCR of key genes will be completed.

**Conclusions:** We expect that IEC function will be altered when cells are treated with food additives and LPS. Findings from this study may translate to IBD patients who have leaky guts. Exposure to food additives that are harmful to IBD guts increases the risk of intestinal injury. These findings may help to define treatment options and dietary changes to improve their clinical outcome.

## ABSTRACT 28

### Fluoroscopy – A valuable modality in retrieving Ingested Magnets

Michelle Edelman MD, Anupama Chawla MD

**Introduction:** There are over 125,000 foreign body ingestions per year, majority among children ages 6 months to 3yrs. Powerful magnet ingestions, called “bucky balls” are a major concern in older children ages 7-15yrs. These magnets are 5times more powerful than traditional magnets, with a high risk of fistualization, and perforation requiring surgery. Prompt identification of magnet ingestion and retrieval is key in preventing complications. Due to their small size (avg 5 mm) magnets can be difficult to find on endoscopy despite prompt identification. In our experience, live fluoroscopy aided in safe magnet retrieval, avoiding surgical intervention.

#### Cases:

AA a healthy 15yr old female presented after ingesting 2 bucky ball magnets. Patient was asymptomatic. Her x-ray confirmed 2magnets in her stomach. Upper endoscopy (EGD) revealed copious food. Gastric magnets were not seen. Live fluoro localized the magnets in the small intestine (SI), beyond the reach of the scope, prompting termination of the EGD. Serial x-rays showed magnets in the right colon (day3) but no progression by day 5. On colonoscopy the magnets were seen in the ascending colon and retrieved.

DM, an 8 year old male presented asymptomatic after ingesting 2 magnets. Abdominal x-ray showed 2attached magnets in the stomach. On EGD, these magnets could not be retrieved. Large amounts of food obstructed the view and fluoro was not available. He was hospitalized for two days. Miralax cleanout was administered. Serial x-rays showed no magnet progression after reaching the cecum. The magnets were only fleetingly visualized with the colonoscope. The surgeons insisted an exploratory laparotomy (ex-lap) needed to be performed. They believed the magnets were beyond the reach of the scope. Fluoro identified magnets proximal to the scope’s tip and adhering to its side. With forward and backward maneuvers and concurrent utilization of fluoro, the magnets were dislodged off the scope and retrieved with no complications.

**Discussion:** These 2 cases showed live fluoro was an invaluable tool for identification of these magnets. For AA, fluoro showed distal progression into the SI and EGD was terminated. This avoided a prolonged search. For DM, fluoro located the magnets, initially hidden under an intestinal fold then attracted to the side of the scope. If fluoro had not been utilized, the patient would have required an ex-lap. Although radiation is required, we believe that live fluoro is an invaluable tool while conducting an EGD/colonoscopy to help localize the magnets, preventing surgical intervention.

## ABSTRACT 29

### Outcome of Isolated Premature Menarche: A retrospective and follow up study

Sehar Ejaz MBBS, Andrew Lane MD, Thomas Wilson MD

**Abstract:** Isolated Premature Menarche is defined as recurrent vaginal bleeding in a prepubertal female in the absence of appropriate secondary sexual characters. There is sparse data of long term follow up of these patients.

**Objectives:** To review the presentation and examine long term follow up of patients with isolated premature menarche.

**Inclusion Criteria:** Ages 6 months to 10 years at the time of initial presentation with premature menstrual bleeding in the absence of appropriate secondary sexual characteristics.

**Exclusion Criteria:** 1. Patients who turned out to have true precocious puberty or a defined pathological cause of vaginal bleeding such as a foreign body, sexual abuse, ovarian cyst, estrogen producing tumor, McCune Albright syndrome, or *recognized* exogenous exposure to estrogen. 2. Refusal to consent to participate. 3. Prisoners

**Methods:** Records of patients seen between 1982 and 2013 meeting ICD9 codes 259.1, 641.9, 626.0, 626.9 which include precocious puberty and abnormal menstrual bleeding were reviewed. Attempts were made to contact patients by telephone. If successful, they were interviewed using a structured interview. The study was IRB approved.

**Results:** 4441 were identified meeting ICD codes and age criteria. 18 patients meet the criteria of precocious menarche. The others were mainly patients with precocious thelarche or adrenarche. 1 was excluded because she was eventually diagnosed with McCune Albright syndrome.

**Presentation:** Presentation information is available on 13: The average age of initial menstruation in these patients was 6.0 years (range 0.25-10.1). Their initial Height SDS was 0.2 (-1.3 – 1.9), Weight SDS was 0.6 (-0.7 – 2.8). Bone age was obtained on 9 out of these 13 patients. The difference between bone age and chronological age was -0.1 suggesting that bone age is not advanced in these patients, as compared to those in true precocious puberty. Average FSH and LH were 2.8 and 0.09 m IU/L respectively, normal pre-pubertal values. All patients except one had undetectable estradiol levels. Estradiol in one patient of 37 pg/ml was unexplained.

Long term follow up those patients now > 12.5 yr of age : 6 patients were interviewed. Of the 6 patients, mean current age is 24.3 yr. All ultimately progressed through otherwise normal puberty. 3/6 have regular menses; 3/6 have irregular menses. 2 have been diagnosed with PCOS. None have oligomenorrhea, one is married and fertile, the remaining 5/6 are unmarried. None were short. Final height – midparental height ranged from -1.3 to 10 cm.

## ABSTRACT 30

### Acute Effects of Hyperoxia on Gene Expression in Lipopolysaccharide-treated Newborn Rat Lung

Jagadish Elumalai MD, Esther Speer MD and Avinash Chander PhD

**Background:** Perinatal infection and oxygen toxicity play a significant role in the pathogenesis of bronchopulmonary dysplasia. The net effect of the injurious insults is a persistent airway inflammation.

**Objective:** To evaluate acute effects of short term hyperoxia on expression of genes associated with inflammation, antioxidant defense and lung development in newborn rat lung following intranasal lipopolysaccharide (LPS) administration.

**Design/Methods:** Sixteen Sprague-Dawley rat pups (2-day-old) were randomized to receive intranasal LPS (10µg/5µl) or normal saline (n=8 in each group). After 24hrs, four rat pups from each group were exposed for 6hrs to hyperoxia (100% O<sub>2</sub>) or room air. Immediately after this exposure, lung tissue was harvested and RNA extracted. Real-time PCR was performed with a custom-made TaqMan array plate containing 43 target genes (associated with inflammation, antioxidant defense and lung development). All values were normalized to the housekeeping gene, β-actin. One-way ANOVA test with bonferroni's correction was used to compare the changes in mRNA expression, among different groups compared to saline-room air group. Results were considered significant at  $p < 0.05^*$ .

**Results:** The mRNA for two inflammation associated genes Interferon-γ and Macrophage inflammatory protein-1α were higher by 94% and 32% respectively with combined but not with individual insults. Hyperoxia down-regulated immune response signaling genes like Myeloid differentiation primary response gene-88\* by 47%, Interleukin-1 receptor-associated kinase 4 (33%), Nitric oxide synthase-3 by 41%, Cytokines like Matrix metalloproteinase-8 by 45%, and this change was prevented by prior exposure to LPS. Pre-exposure to LPS also prevented hyperoxia down-regulation of endothelial cells marker Angiotensin converting enzyme-2\* by 36%, as well as, antioxidant genes like NADPH oxidase p91 subunit\* by 49%.

**Conclusions:** This animal model indicates that short term hyperoxia and airway LPS exposure have an additive effect on pro-inflammatory cytokine expression. Conversely LPS pretreatment followed by hyperoxia prevented the down-regulation of lung remodeling, antioxidant and Toll-like receptor signaling genes. Our study suggests that prior exposure of the newborn lung to LPS has potentially differential effects on gene expression upon exposure to short term hyperoxia.

## ABSTRACT 31

### Increase use of CPAP and early surfactant to reduce Bronchopulmonary Dysplasia

Jagadish Elumalai MD, Adrienne Stroh RN, Mitch Barnett RT, Patricia Schwarz NNP,  
Joseph Decristofaro MD

**Background:** Bronchopulmonary dysplasia (BPD) is a common morbid condition in VLBW premature babies. Invasive mechanical ventilation is one factor known to increase the risk of development of BPD. Use of non-invasive ventilation (CPAP) and early administration of surfactant has been shown to decrease the need for assisted ventilation. Our NICU is taking a multidisciplinary approach in decreasing BPD assembling different teams to develop EBM guidelines.

**Objective:** The aim of our QI project is to decrease the incidence of BPD by decreasing the duration of assisted ventilation by focusing on the use of CPAP as initial mode of ventilation and early administration of surfactant.

**Method:** Baseline use of CPAP as initial mode of ventilation, surfactant, BPD rates in inborn babies with BW < 1500gms admitted to NICU was collected from Jan- Oct-2012 by retrospective chart review. Data were analyzed to identify who would benefit the most from early CPAP and early administration of surfactant and to recommend guidelines for the initial respiratory management.

**Results:** Sixty seven infants were inborn with BW < 1500gm and admitted to NICU. The combined incidence of death and moderate/severe BPD was 35% with increasing severity inversely proportional to gestational age. We found that 39% of these infants were placed on CPAP as the initial mode of respiratory support. Among those infants who were intubated in the delivery room, 41% were successfully extubated to CPAP within 24 hours of life (50% were from 27-29 weeks GA) suggesting that they may not have required intubation. Most infants <27 weeks were intubated for >24 hours and received one dose of surfactant. The median time of administration of first dose of surfactant was 50 minutes (range 5mins-15hrs). Early Surfactant (within 2hrs of birth) was given only in 55% of those infants who had RDS. Majority (88%) of the infants <29wks GA required surfactant and only 22% of >29wks GA needed surfactant therapy.

**Conclusions:** Infants who were successfully extubated with 24hrs of intubation may only require CPAP and early surfactant. We recommend CPAP as initial mode of respiratory support for all 27-29wks gestation infants followed by early surfactant and rapid extubation (INSURE). We recommend early surfactant administration for all infants <26 weeks.

## ABSTRACT 32

### Effect of immunosuppressive therapy on Epstein-Barr Virus Lytic Activation in patients with Inflammatory Bowel Disease

Sameer Lapsia, MD, Siva Koganti, Anupama Chawla MD, Sumita Bhaduri-McIntosh MD

**Background:** Epstein-Barr virus (EBV) affects individuals in myriad ways including causing a generalized viral syndrome, infectious mononucleosis, Burkitt lymphoma, nasopharyngeal carcinoma, and B-cell lymphoma. Patients with EBV-related malignancies exhibit elevated antibody titers against viral capsid and early antigens which occur years before clinical manifestations of Hodgkin's disease, non-Hodgkin's lymphoma, and Burkitt lymphoma. EBV mutants that are defective in lytic viral replication are impaired in their ability to cause lymphomas in mice with severe combined immunodeficiency. Therefore, the responsiveness of latently infected B cells to lytic cycle induction is likely to be a key component of pathogenesis of lymphoproliferative disease, Hodgkin's disease, and other EBV-related tumors.

In patients with severe inflammatory bowel disease (IBD), immunosuppressive therapy with drugs such as steroids, 6-mercaptopurine, methotrexate, and TNF-alpha antagonists becomes essential. Recent evidence suggests that methotrexate which is commonly used as an immunomodulator in patients with rheumatoid arthritis promotes EBV-positive lymphomas by its dual action of inducing lytic viral replication and causing immunosuppression. Anecdotal reports also suggest an increased risk of lymphomas in patients on combination therapy with 6-mercaptopurine and TNF-alpha antagonists.

**Hypothesis:** Patients with IBD on immunosuppressive therapy have a greater fraction of EBV-infected B cells undergoing lytic replication compared to patients not on such medications.

**Methods:** 4 groups of EBV-seropositive patients will be included in the analysis: 10 patients with IBD on immunosuppressants, 10 patients with IBD not on any immunosuppressants, 10 patients with abdominal pain but with no IBD, and 10 healthy controls. Exclusion criteria includes patients with IBD with other comorbid conditions not related to inflammatory bowel disease. Each patient will have 20 ml of whole blood drawn. Real-time PCR will be performed for the *BALF5* gene of EBV to determine viral load. Quantitative-reverse transcriptase PCR will be performed to measure expression of viral lytic genes *BZLF1* and *BMRF1*. Flow cytometric evaluation of peripheral B cells will be used to enumerate total EBV-infected and fraction of lytically-infected cells.

**Results/Conclusions:** Preliminary data has shown that the primers used to perform both the real-time PCR and quantitative-reverse transcriptase PCR are functional and will help determine total viral load and measure viral lytic genes. Flow cytometry studies performed in past experiments have also aided in determining total EBV-infected and fraction of lytically-infected cells. This pilot study will provide the basis for more in-depth investigations into the application of these assays as screening tools for development of EBV-derived lymphomas.

## ABSTRACT 33

### **A randomized, pilot study of the Short Term Respiratory Effects of Synchronized Bi-Level Nasal Continuous Positive Airway Pressure (CPAP) vs. standard Bi-Level CPAP in Very Low Birth Weight Infants**

Shahriar Mokrian, MD, Michael Weisner MSBE, Aruna Parekh MD, Catherine Messina PhD,  
Joseph Decristofaro MD, and Sherry E Courtney MD

**BACKGROUND:** Most neonates have spontaneous respirations even after being placed on mechanical ventilation. Some breaths may be asynchronous with the ventilator and negatively affect tidal volume, PaCO<sub>2</sub>, PaO<sub>2</sub>, work of breathing and energy expenditure. This act of “fighting the ventilator” could also result in other adverse effects including intra-ventricular hemorrhage. Synchronous (Sync) mechanical ventilation via an endotracheal tube is usually done using a pneumotachometer or anemometer to measure flow but they are not easily feasible during non-invasive ventilation. Previous attempts at synchrony with non-invasive ventilation have relied on the Graseby capsule, a motion sensor placed on the abdomen to detect respiration. Several studies using the Graseby capsule and non-invasive ventilation have suggested better short-term outcomes when compared to CPAP alone. The effect on bi-level CPAP (BNCPAP) is unknown.

BNCPAP is non-synchronized ventilation consisting of alternating CPAP pressures (low and high) while the infant breathes at both pressures. High pressure is usually administered for a period of 0.5-1sec. The purpose of this study is to evaluate whether synchronized BNCPAP provides any short-term respiratory advantage over standard (non-synchronized) BNCPAP as routinely given in intensive care nurseries.

**OBJECTIVE:** To evaluate the short term respiratory effects (transcutaneous carbon dioxide “TcCO<sub>2</sub>”, transcutaneous oxygen (TcO<sub>2</sub>), O<sub>2</sub> saturation, heart rate, respiratory rate “RR”, tidal volume “VT” and phase angle “indicator of work of breathing”) of synchronization during nasal ventilation in stable preterm infants <1500 grams and to compare these parameters with those obtained during standard (non-synchronized) BNCPAP.

**STUDY DESIGN/METHOD:** Single center, randomized pilot study in tertiary neonatal intensive care unit of Stony Brook University Medical Center. Eighteen low birth weight infants (gestational age 24 to 31 weeks) who were receiving non-invasive ventilation were randomly assigned to start with either sync or non-sync BNCPAP, and then were studied on the alternate setting.

**RESULTS:** Most (two-thirds) infants placed on sync BNCPAP were actually in synchrony with the CPAP breaths less than 50% of time. Among these, we found no significant difference in any of the measured respiratory parameters in either of the two groups. However, when examining infants with high synchronization rates (> 75% Sync) we found that this mode of ventilation improved TcCO<sub>2</sub> (p=0.05) vs non sync mode.

**CONCLUSION:** Synch BNCPAP may be effective in lowering TcCO<sub>2</sub> and improving work of breathing in a subgroup of infants who trigger the sync BNCPAP.



## ABSTRACT 34

### **Protocol for standard empiric antibiotic and early oral transition in children with acute osteomyelitis based on microbiologic data from a two-year retrospective review**

Asif Noor MD, Sheena Sharma MD, Margaret Connolly MD, Christy Beneri DO

**Background:** Acute hematogenous osteomyelitis is seen primarily in children due to rich blood supply of growing bones compounded by sluggish flow in the metaphyseal region that allows for bacterial proliferation. The dynamic state of growth in children mandates appropriate treatment to prevent chronic infection. Duration of 4-6 weeks of IV antibiotics has been considered standard of care; however newer studies suggest safe earlier transition to oral antibiotics. We hypothesize that oral transition will be as effective as a complete course of IV antibiotics.

#### **Objectives:**

- 1- Retrospective review of children seen at our institution with acute osteomyelitis.
- 2- Implement a standard protocol for empiric antibiotic and early step down therapy

#### **Methods:**

A retrospective chart review was conducted of children identified through diagnostic coding seen at our pediatric ID clinic with osteomyelitis from June 2010 through Dec 2012. Based on the microbiologic data we chose cefazolin as the empiric choice and developed a protocol for an early transition to oral antibiotic (cephalexin). We anticipate a prospective study over the next 3-5 years. Primary outcome measure will be recurrence in IV only group compared to oral switch group using  $\chi^2$  test. Secondary outcome of cost, hospital stay, line infection, and return to physical activity in these 2 groups will be measured by cross tab analysis.

**Results:** A total of 62 children had an osteomyelitis diagnosis and after exclusion of children with underlying medical conditions, 17 uncomplicated cases were selected. Methicillin sensitive *Staphylococcus aureus* (MSSA) was most commonly recovered organism despite the high incidence of CA-MRSA in our community (33%). 10 (58%) were MSSA and 2 (11%) were *Streptococcus pyogenes* cases, 2 (11%) had no growth and in 3(17%) cases no culture was done. IV only treatment was given in 11(65%) and oral switch in 6 (35%) cases. The recurrence risk was same (none) in both groups at 6-12 months follow up.

**Conclusion:** Our approach should target the most common organisms implicated in cases of acute uncomplicated osteomyelitis in our community. This will limit use of unnecessary broad spectrum antibiotics and prevent complications associated with prolonged IV therapy.

## ABSTRACT 35

### Practice survey of prophylactic antibiotic use in pediatric orthopedic surgery

Asif Noor MD, Sharon Nachman MD, James Barsi MD

**Background:** Incidence of surgical site infection (SSI) in pediatric orthopedic surgery depends on host factors and the type of procedure. SSI is lower after idiopathic scoliosis repair (0.5-6.7%) as opposed neuromuscular scoliosis repair (4.3-14.3%). Surgical antibiotic prophylaxis (AP) is one of the modifiable factors shown to prevent SSI. However, AP accounts for 80 % of antibiotic use in pediatric surgery. The widespread use of antibiotics is associated with emergence of resistant organisms, burden on healthcare cost and potential side effects. We hypothesize inappropriate AP use in pediatric orthopedic surgery.

**Objective:** National Survey to assess AP use in pediatric orthopedic surgery

**Methods:** We used Survey Monkey with Enhanced security (SSL/HTTPS) properties to ensure anonymous replies. It is a qualitative study and we included 4 procedures, each with specific risk factors for SSI. We took into account the surgeon's demographic and clinical practice information and collect antibiotic regimen, timing, and MRSA screen data. Pilot Survey was done at SBUMC and 48 residency programs across US. We plan to also survey pediatric orthopedic society members to validate our findings.

**Results:** 55 started and 45 completed the survey (82%). Training: 32 (59%) attendings, 21 (39%) residents, and 1 NP (1.9%). Fellowship: 25 (49%) not trained, 22 (43%) pediatric, 4 (7%) spine and 2 (3.5%) trauma. Experience: 24 (44%) 1-5 yrs, 12 (22%) 6-10 yr, 10 (18%) 11-20 yrs and 8 (14%) have > 20 yrs.

*In spinal fusion for neuromuscular scoliosis*, antibiotic use: 25 (71%) cefazolin, 8 (23%) vancomycin, and 7 (20%) use cefazolin with gentamicin (5), tobramycin (1) and ceftriaxone (1). Timing: 12 (35%) continue AP > 24 hrs. MRSA screen is not done by 20 (64%). *In spinal fusion for idiopathic scoliosis*; antibiotic use: 32 (97%) cefazolin, 1 (1.5%) vancomycin. Timing: 8 (25%) continue AP > 24 hrs. MRSA screen is not done by 18 (62%). *In supracondylar fracture with open reduction*, antibiotic use: 41 (97%) cefazolin, 1 (1.5%) gentamicin. Timing: 7 (17%) continue AP > 24 hrs. *In tibial fracture with closed reduction*; antibiotic: 42 (97%) cefazolin. Timing: none use >24 hrs.

**Conclusion:** A greater variability is seen in antibiotic choice for spinal fusion procedure for neuromuscular scoliosis. In terms of timing the type of procedure affects the length of AP to be > 24 hrs and most do not use MRSA screen/decolonization strategies.

## ABSTRACT 36

### Hypophysitis in Pediatrics: Spare the Scalpel?

Salman Rashid MD, Jennifer Osipoff MD, Thomas A. Wilson MD

**Background:** Pediatric sellar and suprasellar masses are worrisome because of the possibility of malignancy, hormone deficiencies or excess, and impairment of nearby vital structures. Historically, surgical intervention often has been indicated for diagnosis and treatment. We report a case series of pituitary masses seen in pediatric patients to stress the point that some of these masses may not require surgical intervention. The masses described here most likely represent autoimmune hypophysitis. Serial MRIs showed waxing and waning in size of these lesions and in one patient complete resolution.

#### Case Presentations:

- An 8 year old male was incidentally found to have a sub centimeter non enhancing pituitary lesion on MRI done as a work up for ADHD. This patient has been followed for 5 years subsequently during which pituitary functions have remained intact and MRIs revealed disappearance and recurrence of the lesion with the maximum size of 11x16x8 mm.
- A 14 year old female presenting with diabetes insipidus (DI) was found to have 5 mm pituitary infundibular lesion that completely resolved on a follow up MRI. This patient still suffers from DI but the remaining pituitary functions remain intact.
- A 6 year old female with new onset DI was found to have pituitary infundibular thickening and partial resolution on follow up MRIs. This patient was later diagnosed with Growth Hormone deficiency.

None of these patients had neurological deficits or clinical evidence of increased intracranial pressure.

**Conclusion:** Waxing and waning size of pituitary / infundibular lesions suggests “hypophysitis.” As autoimmune hypophysitis is typically associated with pregnancy, literature on this disease in the pediatric population is limited. Based on the our experiences we speculate that “hypophysitis” may be diagnosed clinically and managed conservatively with serial MRIs and without surgical intervention. Pituitary auto antibodies, if available, may be helpful in diagnosis.

## ABSTRACT 37

### **Real-Time Cerebral, Splanchnic, and Renal Near-Infrared Spectroscopy in Very Low Birthweight Neonates: An Analysis of Baseline Variability**

Jonathan P Mintzer MD, Joseph Dayan MD, Monique Gardner BS, Michelle Master MS, Michael Chelala, Gad Alpan MD, Edmund F. LaGamma MD and Boriana Parvez MD

**Background:** Suboptimal O<sub>2</sub> delivery at global or vascular bed-specific sites has been shown to increase morbidity and mortality in critically ill patients. Current methods for assessing adequacy of tissue oxygenation are not able to detect alterations in regional perfusion status. NIRS is emerging as a vascular bed-specific monitoring tool but neonatal normative data is sparse. Knowledge of baseline NIRS signal stability and variability is necessary before assigning clinical relevance of a given alteration in NIRS signals over time. Our study is the first to address the use of differing epoch lengths in assessing signal variability.

**Objective:** To determine the baseline stability and variability of multi-site NIRS measurements.

**Design/Methods:** This is a prospective, observational, non-interventional study of preterm neonates with BW of 500-1250g. Continuous real-time cerebral, renal and splanchnic NIRS was recorded for 7d beginning in the first 72h after birth. Demographic, cardiopulmonary & NIRS data were collected. Variability analyses of NIRS were performed during periods of relative quiescence for four different time epochs for each site as well as between sites using ANOVA.

**Results:** Subjects (n = 14, GA 26 ± 1 wk; BW 920 ± 170g; x ± sd) had average coefficients of variation (CoV) calculated for 4 time epochs from each NIRS site. Regardless of epoch lengths, cerebral CoVs were smallest as compared to renal & splanchnic sites. All between-site comparisons for each monitoring epoch were statistically significant (\*P<0.01). Shorter epochs showed significantly smaller CoVs at the renal (\*\*P=0.0001) & splanchnic (\*\*P=0.04) sites. The splanchnic site exhibited the highest CoV over all epochs with a SD representing 15-22% noise relative to its mean.

**Conclusions:** NIRS signal variability as a function of monitoring epoch length has important implications for the interpretation of regional NIRS measurements. This site-specific degree of variability should be taken into account when designing studies utilizing this technology.

## ABSTRACT 38

### Near-Infrared Spectroscopy Evaluation of Sodium Bicarbonate Corrections in Very Low Birth Weight Neonates

Jonathan P. Mintzer MD, Borianna Parvez MD, Michael Chelala, Gad Alpan MD, and Edmund F. LaGamma MD

**Background:** In VLBW neonates during the first postnatal week, urine bicarbonate losses from immature renal tubules can result in significant metabolic acidosis. To ensure the optimal homeostatic benefits of a normal blood pH, NaHCO<sub>3</sub> correction is occasionally undertaken to replace lost renal bicarbonate. It is unknown whether NaHCO<sub>3</sub> corrections confer a measurable benefit on oxygen delivery and consumption parameters in this population.

**Objective:** To determine the effects of NaHCO<sub>3</sub> replacement of renal bicarbonate losses on cardiopulmonary, laboratory, and tissue oxygenation parameters in VLBW neonates.

**Design/Methods:** Data were collected in an observational NIRS survey of 500-1250 g neonates during the first postnatal week. A before-after analysis of NaHCO<sub>3</sub> corrections (0.3 x weight [kg] x base deficit [mmol/L]; infused over 30 minutes) of suspected renal bicarbonate wasting was conducted upon cardiopulmonary, laboratory, and cerebral, renal, and splanchnic NIRS data.

**Results:** Twelve subjects received a total of 17 NaHCO<sub>3</sub> corrections. Gestational age was  $27 \pm 1$  wk (mean  $\pm$  SEM) and birth weight was  $912 \pm 45$  g. All subjects were in stable clinical condition with normal blood pressure and heart rate. NaHCO<sub>3</sub> corrections delivered a mean fluid bolus of 4.5 mL/kg and shifted the base excess from  $-7.6 \pm 0.4$  to  $-3.4 \pm 0.5$  ( $p < 0.05$ ) with an increase in median pH from 7.23 to 7.31 ( $p < 0.05$ ). No significant changes were observed in systolic or diastolic blood pressure, pulse oximetry, pCO<sub>2</sub>, lactate, sodium, BUN, creatinine, or hematocrit. Cerebral, renal, and splanchnic rSO<sub>2</sub> were 74, 66, and 44% respectively at baseline and were unchanged in response to NaHCO<sub>3</sub> correction. Cerebral, renal, and splanchnic fractional tissue oxygen extractions were 0.21, 0.29, and 0.52 respectively at baseline and were also unchanged following NaHCO<sub>3</sub> infusion.

**Conclusions:** Correcting metabolic acidosis attributed to renal bicarbonate wasting in this cohort of VLBW neonates produced no discernible effects on cardiopulmonary parameters including rSO<sub>2</sub> and FTOE. A definitive benefit of NaHCO<sub>3</sub> correction cannot be supported by this analysis. We speculate that real-time changes in rSO<sub>2</sub> and/or FTOE may aid in distinguishing renal bicarbonate wasting from metabolic acidosis caused by oxygen delivery/consumption imbalance, thus potentially enabling greater precision in promptly directing appropriate therapies to specific mechanisms.

## ABSTRACT 39

### Effects of “*Booster*” Packed Red Blood Cell Transfusions on Cerebral, Renal, and Splanchnic Near-Infrared Spectroscopy in Very Low Birth Weight Neonates During the First Postnatal Week

Jonathan P. Mintzer MD, Borianna Parvez MD, Michael Chelala, Gad Alpan MD, and Edmund F. LaGamma MD

**Background:** pRBC transfusions are commonly performed in neonatal intensive care and improve cerebral, renal, & splanchnic regional tissue oxygenation ( $rSO_2$ ) when given for *symptomatic* anemia as evaluated using NIRS. In our institution, we utilize a *booster* pRBC transfusion strategy, in which a 15mL/kg transfusion is provided following 10mL/kg of measured blood removed for laboratory testing in VLBW neonates during the first postnatal week. We sought to evaluate the efficacy of *booster* pRBC transfusions utilizing NIRS.

**Objective:** To determine the effect of *booster* pRBC transfusions on cerebral, renal, and splanchnic  $rSO_2$ .

**Design/Methods:** Data were collected in a prospective, observational, non-interventional, NIRS survey of “stable” neonates with BW 500-1250g. Cerebral, renal, & splanchnic NIRS monitoring was begun within 72h of birth and continued for 7 days. Demographic, transfusion, laboratory, cardiopulmonary, and NIRS data were collected. Fractional tissue oxygen extraction [ $F_{TOE} = (SpO_2 - rSO_2) / SpO_2$ ] was calculated for each site. Before/after *booster* pRBC transfusion comparisons were performed using paired Student's t-test or one-way repeated-measures ANOVA.

**Results:** Ten subjects (GA  $26 \pm 1$  wk; BW  $879 \pm 154$ g;  $x \pm SD$ ) received a total of 14 *booster* pRBC transfusions at a postnatal age of  $3 \pm 2$ d. 79% (11/14) of transfusion cases were mechanically ventilated, 29% (4/14) were given in the context of enteral feeds, & 14% (2/14) were provided during vasopressor usage. Mean hematocrit increased from  $35 \pm 1$  to  $39 \pm 1\%$  ( $p < 0.05$ ) following *booster* transfusion, whereas blood pH, base deficit, lactate, creatinine, & all cardiopulmonary parameters (HR, BP, &  $SpO_2$ ) were unchanged. Consistent with an augmented red cell mass, cerebral, renal, & splanchnic  $rSO_2$  measures significantly increased 10, 18, & 16%, with concomitant decreases in FTOE of 27, 30, & 9%, respectively (all  $p < 0.05$ ). No adverse effects were seen following any *booster* pRBC transfusion.

**Conclusion:** Following repeated phlebotomy in premature neonates, *booster* transfusions augmented red cell mass (RCM) and seemed to improve tissue oxygenation measures; no changes were observed in conventional cardiovascular assessments. NIRS-derived  $rSO_2$  and FTOE may help identify subclinical signs of reduced  $O_2$  delivery with elevated tissue  $O_2$  extraction. We speculate that *booster* transfusions can sustain RCM before iatrogenic phlebotomy causes  $O_2$  delivery-consumption imbalance.