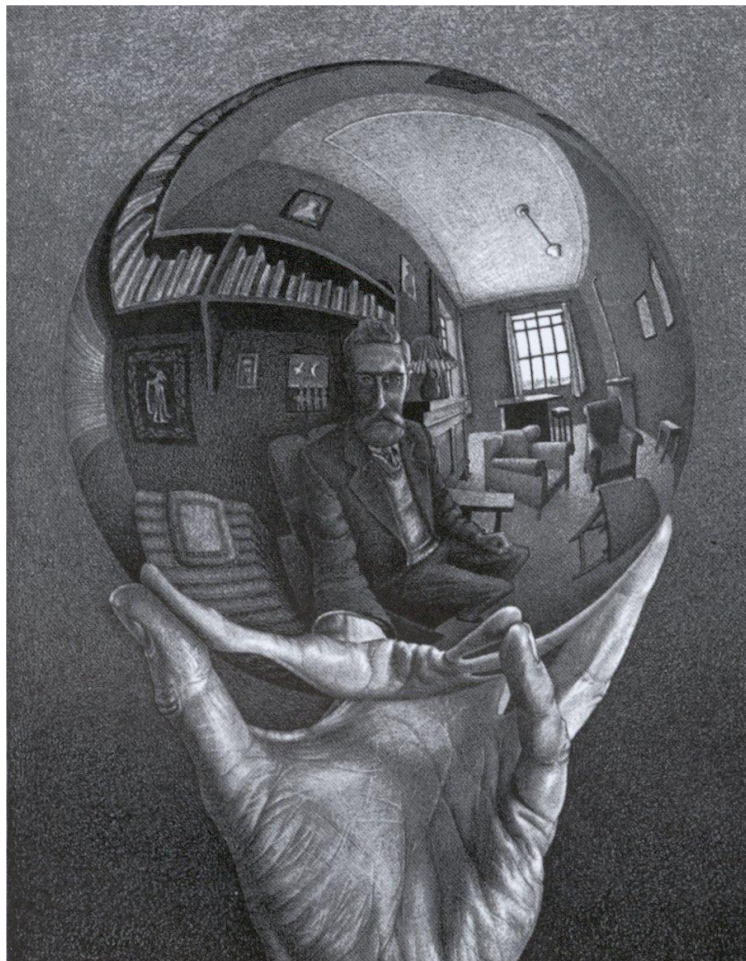




Stony Brook Children's

Pediatric Research Day



May 14, 2014

AGENDA

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

8:30 – 8:45 Opening remarks: Dr. Margaret McGovern –Main Theater
Introduction of Keynote Speaker: Dr. Andrew Lane

8:45 – 9:30 Keynote Address – Main Theater

Judith Palfrey, MD, T. Berry Brazelton Professor of Pediatrics,
Harvard Medical School, Boston Children’s Hospital
“Children’s Health Advocacy”

9:30 – 9:45 Coffee Break-Wang Center Lobby

9:50 – 10:35 Residents Platform Presentations – Main Theater

Priyadarshani Giri, MD: *“The Effect of Antenatal Steroids on Catecholamine Response by Mouse Pheochromocytoma Cells in Acute Hypoxic Conditions”*

Caitlin Heyden, DO: *“Pre-participation evaluation of young athletes for sudden cardiac death: Are schools asking the right questions?”*

Katherine B Huston, MD: *“Concussion Aftercare Instructions from the Pediatric Emergency Department: A Quality Improvement Project”*

10:35 – 11:20 Fellows Platform Presentations – Main Theater

Alexa S Calero, MD: *“Does Hypoxia Evoke Enkephalin Synthesis and Release from Chromaffin Cells?: Investigating a Novel Stress Response to Acute Hypoxia”*

Sameer Lapsia, MD: *“The effect of immunosuppressive therapy on Epstein-Barr Virus lytic activation in patients with Inflammatory Bowel Disease”*

Michelle Edelman, MD: *“Bacterial antigens and Food additives alter membrane integrity and induce intestinal inflammation in vitro”*

11:30 – 12:30 Poster Session – Theater Lobby

12:30 – 1:30 Lunch – Zodiac Gallery (Lower Level)
Dr. Palfrey to discuss her academic medicine research path

Presentation of awards and closing remarks by Dr. Margaret McGovern

Keynote Speaker Biography

Judith Palfrey received her undergraduate degree from Harvard University and her medical degree from Columbia University College of Physicians and Surgeons. After completing an internship and residency in pediatrics at Albert Einstein College of Medicine and a fellowship in community child health at Children's Hospital, Boston, she joined the faculty at Harvard University School of Medicine. There she served as chief of General Pediatrics at Children's Hospital Boston for 25 years. Currently she is the T. Berry Brazelton Professor of Pediatrics, and director of the Global Pediatrics Program.

In addition to guiding, creating and directing community pediatric initiatives in the greater Boston area, she has had an impact on the health of children nationally. Dr. Palfrey has served in leadership positions in the American Academy of Pediatrics and other organizations for years, culminating in service for a term as AAP president from 2009-2010. In 2011 she was appointed Director of the Let's Move Obesity Prevention Initiative by First Lady Michelle Obama. Internationally, she has assisted with health care programs in Indonesia, Chile, and Zambia.

Dr. Palfrey's research focus has been on preschool child development, intervention strategies for children with developmental disabilities, and health delivery to families of children at high risk. To study these areas, she has been awarded numerous grant from diverse sources such as the Robert Wood Johnson foundation, the Dyson foundation, the Department of Health and Human Services, and others. Her research has been very productive, resulting over 100 published papers, and many books.



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ABSTRACT 1

The Effect of Antenatal Steroids on Catecholamine Response by Mouse Pheochromocytoma Cells in Acute Hypoxic Conditions

Priyadarshani Giri MD, Alexa Calero MD, Hazel Villanueva MD, Marian Evinger PhD

Background: During early postnatal life, premature infants are particularly susceptible to hypoxic crises in utero, during delivery, and postnatally, which produce significant morbidity and mortality. Because the immature lungs of premature infants make them more susceptible to hypoxia, the mother is often treated with antenatal steroids to accelerate fetal lung maturation and improve lung function. In the third trimester and in early post-natal life, the adrenal medulla functions as the primary oxygen sensing organ prior to maturation of the sympathetic nervous system. Decreased oxygen concentrations [O₂] sensed by the adrenal medulla during hypoxic episodes, evoke rapid catecholamine (CA) release in the neonate, including epinephrine (Epi), critical for physiologic responses.

Because neonatal responses to hypoxia are difficult to study at the cellular level, Mouse Pheochromocytoma Cells (MPCs) provide a biologically relevant experimental system to assess *in vitro* the influences of antenatal steroids on catecholamine responses to acute hypoxia sensed by the adrenal medulla.

Objective: To determine whether acute hypoxia affects CA release from chromaffin-like MPC cells and to assess whether hypoxia can alter the influence of antenatal steroids on chromaffin cell CA release.

Methods: MPC 10/9/96 cells are subjected to specific [O₂] (10%-hypoxia vs 21%-normoxia) in a Billups-Rothenberg chamber. A Simplified Fluorometric Assay (1962) was adapted to measure CAs released by MPC 10/9 cells into media. This assay was sensitive to epinephrine release to 1 ng/ml. Effects of antenatal steroids were assessed for MPC 10/9s plated in glucocorticoid (GC) depleted media, and then treated with dexamethasone (DEX) or betamethasone (βMeth).

Results: As seen for chromaffin cells *in vivo*, hypoxia elicits a rapid and robust release of CAs from MPC 10/9 cells. Epinephrine release initiates within 15 min of hypoxia onset and is maximal at 30-45 min relative to normoxic cultures. Glucocorticoid steroids likewise evoke CA release from MPC cells in a dose-responsive manner. DEX (tested from 10⁻⁹ to 10⁻⁵M) elicits greatest CA release at 1 uM, a dose commonly used for premature infants, while maximal response to β-Meth occurs at 10-100-fold higher doses. Importantly, hypoxia markedly abrogates the magnitude of CA release evoked by DEX and by βMeth at physiologic GC concentrations.

Conclusions: Hypoxia produces a rapid increase in Epi release from MPC cells analogous to effects on adrenal chromaffin cells in neonates. Notably, hypoxia blunts the CA-releasing efficacy of antenatal steroids at physiologic GC concentrations. Future studies will explore the mechanism for potential hypoxia compromise of the efficacy of antenatal steroids in neonates.

ABSTRACT 2

Pre-participation Evaluation of Young Athletes for Sudden Cardiac Death: Are Schools asking the Right Questions?

Caitlin Heyden DO, Marybeth Heyden DNP, James Nielsen MD,
Catherine Messina PhD, Laurie Panesar MD

Introduction: Identifying competitive athletes at risk for sudden cardiac death (SCD) is challenging. A 12 question pre-participation evaluation (PPE) endorsed by the American Heart Association (AHA) and American Academy of Pediatrics (AAP) was developed to help identify athletes at risk for SCD. PPE forms are often the primary and most cost efficient tool used to screen athletes for SCD risk. There is no standardized approach to PPE in most states and the endorsed PPE is not uniformly implemented. Variability in PPE screening is likely to result in under-recognition of athletes with risk factors for SCD.

Methods: The PPE form utilized in 110 school districts (public and private) on Long Island, New York were compared to the AHA and AAP endorsed PPE form. Personal history, family history and physical examination questions asked on the school PPE forms were collected for each district.

Results: Sixty two percent of PPE forms asked $\leq 3/5$ personal history questions. Less than 50% asked about symptoms of chest pain or dyspnea. The most common question asked was history of syncope in 58%. None of the recommended family history questions were asked in 68% of PPE forms. Most commonly included family history questions included family members with SCD <50yo (31%) and family member disabled by cardiac disease <50yo (31%). Questions regarding family history of specific cardiac conditions (HCM, long QT) were included in only 12.6% of forms. Twenty percent of school district's forms asked no history questions, while only 6% addressed all eight history questions. Ninety-five percent of PPE forms addressed $\leq 50\%$ of recommended physical examination questions. Only 3,6% of forms addressed all 4 of 4 physical exam points. New murmur and blood pressure were the parameters most often included (100% and 98% respectively). Overall, 71% of the PPE forms asked less than or equal to 50% of the recommended questions, with merely 3.6% of school district forms asking all 12/12 endorsed points

Conclusions: There was significant variability in the questions asked on PPE forms among school districts. The majority of PPE forms were markedly deficient in identifying personal history, family history and physical examination risk factors for SCD in young athletes. Uniform implementation of the AHA and AAP endorsed PPE would likely increase detection of young athletes at risk for SCD.

ABSTRACT 3

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

Katherine B Huston MD, Carl Kaplan MD

Background: The 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.

Objective: To assess and improve compliance with the provision of current guideline based discharge instructions and activity restrictions to pediatric emergency department (PED) patients diagnosed with concussion. Our goal was to achieve and maintain a compliance rate of 90% or greater.

Design/Methods: All cases presenting to the PED 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 13-month period were reviewed for documentation of patient instruction to abstain from physical activity until cleared by a physician. Patients excluded were those younger than 6 years and older than 18 years, patients diagnosed with “head injury” whose cases did not meet diagnostic criteria for concussion, and patients who were admitted. Baseline data was collected, and four interventions were performed sequentially;; (1) creation of an instructional sheet to give to parents, (2) 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. Compliance rates were calculated following each intervention and on a monthly basis after all interventions ceased.

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. At the conclusion of the 13-month study period the compliance rate was 93%.

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 4

Does Hypoxia Evoke Enkephalin Synthesis and Release from Chromaffin Cells?: Investigating a Novel Stress Response to Acute Hypoxia

Alexa S Calero MD, Marian J Evinger PhD

Background: Oxygen deprivation is a significant cause of neonatal morbidity and mortality. Accordingly, hypoxia evokes substantial catecholamine release from the adrenal medulla. Prior to maturation of the sympathetic nervous system, the adrenal medulla senses hypoxia. However, although the adrenal medulla also synthesizes opioid peptides, notably enkephalin, we do not know whether acute hypoxia accelerates chromaffin cell-based enkephalin production as it does in the central nervous system.

Objective: We seek to determine whether acute reduction in oxygen concentration [O_2] stimulates the synthesis and release of enkephalin in chromaffin cells.

Design/Methods: Mouse pheochromocytoma cells (MPC10/9/96 line) were used to investigate hypoxia-evoked enkephalin synthesis and release. MPC cells were subjected to reduced oxygen ($[O_2] = 10\%$) by incubation in a Billups-Rothenberg chamber. Following preparation of cell extracts, synthesis of pre-pro-enkephalin (pENK) messenger RNA (mRNA) was analyzed in reverse-transcriptase polymerase chain reactions (RT-PCR) using cDNA templates synthesized from MPC 10/9 cell total RNA; cyclophilin mRNA was utilized as an internal control. A mouse Met-enkephalin peptide (ENK) ELISA was employed to measure enkephalin cellular content and release.

Results: Reduced oxygen concentrations stimulate enkephalin gene expression in MPC cells. When MPCs are incubated in 10% O_2 for intervals of 0, 15, 30, 45 and 60 minutes, RT-PCR reveals a 3 - fold ($p = 0.004$) increase in enkephalin mRNA by 30 min. Reduced $[O_2]$ also stimulates enkephalin peptide (ENK) production. Cellular content of ENK increases by 15 - 20 % after 60 minutes of hypoxia. Hypoxia also markedly enhances ENK secretion: we detect a 115 % increase in Met-ENK secreted into media following 30 minutes of hypoxia

Conclusions: Acute hypoxia stimulates the release of Met-enkephalin from chromaffin cell-derived MPC cells. Hypoxia-evoked ENK release is accompanied by stimulation of pre-pro-enkephalin gene expression (as reflected by increased mRNA synthesis) and enhanced production of ENK peptide. Clinically, the ability of acute hypoxia to evoke significant release of enkephalin opioid peptides from chromaffin cells in neonates may influence reflex regulation of blood pressure and heart contractility during asphyxia.

ABSTRACT 5

The effect of immunosuppressive therapy on Epstein-Barr Virus lytic activation in patients with Inflammatory Bowel Disease

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

Background: Epstein-Barr virus (EBV) is a gamma herpesvirus that persists as a lifelong infection by remaining in the latent phase of its life cycle within B lymphocytes. EBV can manifest in patients as a viral syndrome or infectious mononucleosis. EBV-derived malignancies include Burkitt, Hodgkin, and non-Hodgkin lymphomas (NHL). Patients with EBV-related malignancies demonstrate high antibody titers against lytic antigens years before clinical presentation occurs as well as high EBV load. Animal studies have found that EBV mutants that are defective in lytic viral replication are unable to give rise to EBV-tumors. Recent evidence suggests that methotrexate, used as an immunomodulator in patients with rheumatoid arthritis, may promote EBV+ lymphomas by inducing lytic viral replication. An increased risk of NHL has been reported in patients with inflammatory bowel disease (IBD) treated with immunosuppressive therapies such as azathioprine and TNF-alpha antagonists (infliximab).

Hypothesis: Patients with IBD on immunosuppressive therapy have a greater EBV viral load and increased fraction of EBV-infected B cells undergoing lytic replication compared to patients not on immunosuppressants.

Design/Methods: 40 patients were enrolled in this pilot study: 1. Ten patients with IBD on biologic therapy (immunosuppressant) with Infliximab for ≥ 6 months (**I+**). 2. Ten patients with abdominal pain but no evidence of IBD based on colonoscopy. 3. Ten healthy controls. 4. Ten patients with IBD who were never exposed to immunosuppression (**I-**). Flow cytometry was used to determine the fraction of peripheral blood B cells 1) infected with EBV and 2) expressing lytic antigens. Additionally, quantitative-reverse transcriptase PCR was performed to detect EBV lytic gene expression and real-time PCR was used to determine EBV load in peripheral blood mononuclear cells.

Results: As expected, the percentage of T lymphocytes was significantly lower in the **I+** group compared to **I-** patients and healthy controls ($p \leq 0.05$). While **I+** patients showed a significant increase in the percentage of EBV-infected B cells (>2.5 fold; $p=0.02$) and EBV load in peripheral blood mononuclear cells (>3.5 fold; $p \leq 0.02$) they did not demonstrate an increase in lytically-infected B cells compared to the other three groups. However, **I+** patients had a statistically significant increase in EBV early lytic gene expression compared to the other groups by quantitative reverse transcriptase PCR ($p \leq 0.05$).

Conclusions: IBD patients on TNF antagonists have higher EBV load in their mononuclear cells compared to immunosuppressant-naïve IBD patients and control subjects. High viral load is derived from increase in EBV-infected B cells in the peripheral blood. Although EBV lytic activation occurs to a greater extent in patients on anti-TNF therapy, the lytic cycle remains incomplete thereby precluding detection of lytic cells.

ABSTRACT 6

Bacterial antigens and Food additives alter membrane integrity and induce intestinal inflammation in vitro

Michelle Edelman MD, Leahana Rowehl MS, Grace Gathungu MD

Background: The pathogenesis of Inflammatory Bowel Disease (IBD) is unknown. One predominant theory proposes that IBD occurs in those with a genetic predisposition and an abnormally permeable mucosal barrier. This leaky gut results in continuous translocation of bacterial antigens into epithelial cells releasing a cascade of inflammatory mediators. This leads to chronic inflammation. Tumor necrosis factor alpha (TNF α), a pro-inflammatory cytokine, and Lipopolysaccharide (LPS), a bacterial endotoxin, induce innate immune responses and mucosal hyperpermeability in vivo. They are both established mediators of inflammation in IBD. In this study we examined the additional impact of two common food additives. Potassium bromate (KBrO₃) is an oxidizing agent used to strengthen dough. Allura Red (AR) is used to color candy and medications. Both have harmful effects; KBrO₃ is carcinogenic and AR causes DNA damage. We propose that food additives are environmental triggers of intestinal inflammation. We also examined the interaction of AR or KBrO₃ with LPS and/or TNF α to assess if there is an additive effect.

Methods: Co-cultured human colon cancer cells (Caco2 BBE-HT29) were grown for 14 days until the establishment of a polarized epithelial monolayer. Cells were treated for 24 h with 50, 200, 1000 and 5000 μ M AR or 1 and 10mM KBrO₃ with a combination of 10 μ g/mL LPS and/or 100ng/mL TNF α . Proliferation was measured using the alamarBlue assay. Transepithelial electrical resistance (TEER) was determined using a volt-ohm meter. Supernatant was collected and cytokine expression of IL-6 and IL-8 were measured by enzyme-linked immunosorbant assay (ELISA).

Results: Proliferation was significantly reduced in cells treated with both AR and KBrO₃ in a dose dependent fashion. There was no additive effect with the addition of either LPS or TNF α . AR resulted in increased TEER. KBrO₃ decreased TEER in a dose dependent fashion. LPS and TNF α minimally inhibited the effects of AR but did not alter TEER in KBrO₃ treated samples. AR significantly increased IL-6 and IL-8 production (p<0.05). This was enhanced with the addition of LPS and/or TNF α . KBrO₃ did not significantly increase production of IL-6. IL-8 production was significantly increased with KBrO₃ treatment (p<0.05).

Conclusion: This in vitro study demonstrates that AR and KBrO₃ alter cell proliferation, epithelial resistance and enhance pro-inflammatory cytokine release. These effects are potentiated by LPS and TNF α . This suggests that food additives should be further analyzed for their role in impairing the integrity of the intestinal epithelial barrier. The underlying mechanisms of this process need to be further elucidated.

ABSTRACT 7

Epidemiology of TB and risk factors of TB in the pediatric population in Suffolk County

Aderonke Adefisayo MD, Katherine Morgera DO, Christy Beneri DO

Background: According to the World Health Organization, TB is second only to HIV as a cause of death due to infection. In the US, the incidence of TB has decreased over the past decade but the incidence in Suffolk County still remains one of the highest in New York State with 2.2-4.4 cases per 100 000. Specific groups with higher latent TB infection (LTBI) and disease rates include immigrants, international adoptees, refugees from or travelers to high prevalence regions (i.e. Africa, Asia, Latin America and countries of the former Soviet Union), residents of correctional facilities and homeless people. In our population in Suffolk, according to the US census for 2007, 17% of the population of Suffolk was foreign born and these numbers have most likely increased. Central and South America played a major role in the TB found in Suffolk County with most of the cases from immigrants from Peru, El Salvador, Mexico and Honduras. Since this particularly pertains to the population we serve, it is increasingly imperative to study the epidemiology of TB and risk factors of TB in the pediatric population in Suffolk County.

Objectives: 1) Describe the epidemiology of LTBI in Suffolk County NY and understand the demographics of our population and 2) Identify risk factors for LTBI in order to identify where efforts at disease prevention may be most relevant. *I hypothesize* that in our patient population, LTBI will be higher in foreign-born children or those with foreign-born parents.

Study Design/ Methods: We performed a retrospective chart review of patients who were seen at the Pediatric Infectious Disease outpatient clinic from 2010 to present for positive Quantiferon (QFT), tuberculin skin test (TST), TB exposure or diagnosis of LTBI. A case report form was used to collect data about patients in relation to multiple factors including country origin of birth, parent's origin of birth, other demographics, TB exposure and travel to an endemic area. This was then collated into an Excel form and analyzed using SPSS.

Results: We reviewed 49 charts in all, with patient ages ranging from 2 months to 18 years old. Regarding place of birth, 23 children were US-born, 21 were foreign-born and 5 were not documented. For the parents of each child, 6 were US-born, 23 were foreign-born (where at least one parent of the pair was foreign-born) and 20 were not documented. Of the 49 charts reviewed there were 5 area codes which appeared with equal frequency. The most frequent risk factor for evaluation from these areas was travel to high risk areas or foreign birth. The country that appeared most frequently was El Salvador followed by Mexico and Haiti. Some of the most frequently appearing zip codes correlated to specific countries, the zip code of 11717 (Brentwood), represented patients came from El Salvador and Mexico while 11978 (West Hampton) represented patients from Ethiopia. Treatment for LTBI was initiated for 28 patients. 21/28 (75%) were had a least one documented person with foreign birth (either child or parent).

Conclusions: Although we only had a small sample size, there does appear to be a correlation between certain zip codes and evaluation for LTBI. In addition LTBI as hypothesized was higher in foreign-born children and/or those with foreign born parents. This information can help us now identify particular areas where education and evaluation for LTBI could have a significant impact.

ABSTRACT 8

Maternal Attitudes and Knowledge on Breastfeeding: A Descriptive Study on Day of Discharge

Ashley Apruzzese MD, Margaret Connolly MD, Catherine R. Messina PhD

Background: Breastfeeding (BF) provides many health benefits both for mother and baby, and is strongly supported by the American Academy of Pediatrics and the World Health Organization. BF is recommended exclusively until 6 months of age, with continued supplementation until 1 year of age. Maternal initiation and continuation of BF is a complex relationship with multiple influencing factors: demographics and socioeconomic factors, BF knowledge and education, postnatal demonstration and support, and formula supplementation. At Stony Brook in 2012, only 20-35% of infants in the newborn nursery were exclusively breastfed.

Objective: To investigate the relationship between knowledge, attitudes and experience of mothers on breastfeeding prior to discharge from Stony Brook Mother-Baby unit.

Methods: From May-Dec 2013, a confidential survey (English and Spanish) was administered to all mothers over 18 years of age on day of discharge. The survey was designed based on review of the literature and the known influences on BF. Data were analyzed using SPSS. Frequency distributions, independent sample t-tests, cross-tabular analyses, and multivariate logistic regression analyses were conducted.

Results: Demographics reflect all participants (n=142); mothers who exclusively planned on and gave formula (n=28) were excluded from additional analyses. The two groups compared were: women breastfeeding exclusively (n=62) and women who intended to breastfeed, but were doing both or giving formula (both/formula) (n=39) at time of discharge. All mothers agreed that breast milk was more beneficial than formula. On day of discharge, 48 % (n=62) of mothers were exclusively BF, and 26 % (n=34) were partially BF. Demographic factors (race, education, income, # previous children, delivery type) were associated with choice to exclusively BF ($p<0.05$). With multivariate logistic regression analyses, women with college education and vaginal deliveries were 80% and 70% more likely to be exclusively BF, respectively ($p<0.05$). Attendance of the discharge class, lactation specialist consultation and previous BF experience did not show a statistically significant relationship to infant feeding choice. Overall women who answered the knowledge questions correctly were more likely to be exclusively BF, even when accounting for educational level.

Conclusions: These associations may be helpful in guiding future educational interventions and promote exclusive BF to interested post-partum mothers. These interventions may be more effective if given independent from the large amount of post-partum information mothers already receive.

ABSTRACT 9

Greeting Our Patients: What Should We Say?

Chaim Zev Aron DO, Lisa Wilks-Gallo MD, Catherine R. Messina PhD

Background: Patient satisfaction depends upon the physician-patient relationship. This relationship can be influenced by the introductions made at the initial patient encounter. Prior studies established that adult patients and parents of Pediatric patients prefer to be greeted by their names. Despite this data, it is our perception that many providers continue to address parents of Pediatric patients by generic titles; including Mommy, Daddy, Mom, Dad, Sir and Ma'am.

Objective: To determine what generic title is preferred by parents of Pediatric patients when greeted by medical staff and to assess their feelings when addressed by these titles.

Design/Methods: Gender-specific surveys were administered to parents of patients on all pediatric inpatient units. Parents' opinions on generic titles were collected (i.e. Mom, Dad, Mommy, Daddy, Sir, Ma'am, being addressed without a name/title). Parent/child demographics and confounding factors (history of chronic illness, age of medical provider) were also collected.

Results: The data reveals that, in past medical encounters, 79.5% of fathers (N=46) had been called Dad or Daddy and 90% of mothers (N=91) had been called Mom or Mommy. Fathers preferred the title Dad over Daddy, Sir, or no name (69.8%, 14%, 9.3%, and 7% respectively). Mothers preferred the title Mom over Mommy, Ma'am, or no name (79.8%, 7.1%, 6%, and 7.1% respectively). Only 7% of fathers dislike the title Dad; however, many dislike being addressed as Daddy, Sir, or without a name (24.4% 32.7% and 48.5% respectively). Only 1.2% of mothers dislike the title Mom; however many dislike being addressed as Mommy, Ma'am, or without a name (19.8%, 46.4%, and 64% respectively). These results were consistent across the population demographics surveyed. Only small subsets achieved statistical significance.

Conclusions: Patients prefer to be addressed by their name; however, our data demonstrates that most parents recall medical staff addressing them by generic parent titles (Mom, Mommy, Dad, Daddy). No prior studies evaluated which generic title is most acceptable to parents. Our results suggest that parents of Pediatric patients prefer to be called Mom or Dad over other generic titles. The majority of parents dislike being addressed by medical staff without a name or title. Many parents also dislike being addressed as Mommy/Daddy or Ma'am/Sir.

ABSTRACT 10

Video EEG monitoring in the Pediatric Intensive Care Unit

Milena Goldshmidt MD, Susan Manganaro MD, Lourdes A Bello-Espinosa MD, Mary Andriola MD

Background: Continuous EEG monitoring in the pediatric ICU has been found to be feasible and provides clinically useful information and clinical neurophysiology has been shown to substantially improve management of individual ICU patients. Continuous EEG monitoring for pediatric ICU patients with increased intracranial pressure or status epilepticus has been previously described. A study screening for potential indications for EEG monitoring in the PICU found that monitoring strategies that vary in indication and duration exert a substantial impact on monitoring yield and some impact on nonconvulsive seizure yield; thus if a hospital has limited monitoring resources, an optimal utilization strategy should be employed.

Objectives: To determine demographic and electroencephalographic characteristics of pediatric patients monitored with VEEG in the PICU *and* to examine the demographics, length and indication of monitoring, frequency of clinical and electrical seizures

Methods: The results of Video EEG studies conducted in the Pediatric Intensive Care Unit at Stony Brook University Hospital were reviewed retrospectively over an 18 month period. Patients aged 3 weeks to 21 years were included in the study. Data from the first EEG was included for each patient only. Data regarding age, gender, past medical history, indication for monitoring, presence of electrographic and clinical seizures and patient outcome were gathered. The subjects were identified by patient logs kept in the EEG laboratory.

Results: 100 patients between the ages of 3 weeks and 21 years old who underwent Video EEG monitoring over an 18-month period were identified. 52% were female, 48% male. 20% of patients had a past medical history of developmental delay, 12% had a known chromosomal abnormality and 40% had known epilepsy. 70% of patients were monitored for a period of 24 hours or less. 28% of the studies were carried out in the sedated state. 12% had only electroclinical seizures, 5% had only electrographic seizures and 18% had both, however only 19% of patients had a normal study. 36% of patients were on an antiepileptic medication at the time of monitoring.

Conclusions: Seizures were present in 35% of patients monitored in the Pediatric Intensive Care Unit. The implementation of Video EEG monitoring in the critically ill patient is a valuable tool that has helped to direct diagnosis, treatment and prognosis in these patients.

ABSTRACT 11

The applicability of Quantiferon testing in the pediatric population of Suffolk County for the detection of latent tuberculosis infection

Katherine Morgera DO, Aderonke Adefisayo MD, M. Christy Beneri DO

Background: The diagnosis of tuberculosis (TB) is a challenge in the pediatric population. Children have a high chance of progressing from latent tuberculosis infection (LTBI) to active disease making recognition of LTBI critical. Tuberculin skin testing (TST), used to aid diagnosis, is not ideal as difficulties include proper placement and interpretation, especially in light of BCG vaccination. Interferon gamma release assays such as the Quantiferon TB Gold in-tube assay (QFT), are newer diagnostic tools that do not cross react with BCG vaccine. Suffolk County has many immigrant families from TB endemic areas. The performance of QFT in our pediatric population might be useful as an alternative to TST.

Primary Objectives: 1) Determine the use of QFT for the detection of LTBI in our population and 2) Evaluate mitogen responses in children <5 years of age

Secondary Objective: 1) Evaluate the correlation between QFT and TST if available and 2) Attempt to risk-stratify patients with positive QFT based on birth country, contact with active TB, travel or foreign-born parents.

I hypothesize that QFT will have a greater utility than the TST in our patient population and that healthy children less than 5 years will show adequate mitogen control responses.

Study Design/ Methods: We performed a retrospective chart review of patients who were seen at the Pediatric Infectious Disease outpatient clinic from 2010 to present for positive QFT, tuberculin skin test TST, TB exposure or diagnosis of LTBI. A case report form was used to collect data about patients in relation to multiple factors including country origin of birth, parent's origin of birth, other demographics, TB exposure and travel to an endemic area. This was then collated into an Excel form and analyzed using SPSS.

Results: We reviewed 49 charts in all, with patient ages ranging from 2 months to 18 years old. Of these, 25 had QFT testing performed. The population included five patients under the age of five (range 12 months to 3 years old), with all patients having an adequate mitogen response. Of the 10 patients with a positive QFT result; 5 were born outside of the USA, 4 had contact with active TB, 7 had travel exposure and 4 had foreign-born parents. Of those with a positive QFT 6 had a TST performed, 2 had no TST performed and 2 had unknown TST status. All 6 with a positive QFT had a positive TST. Of those 15 patients with a negative QFT, 6 had a positive TST however only one patient received treatment.

Conclusions: QFT may be a useful tool for the detection of LTBI in our population but may be underutilized. In our population (children as young as 12 months) QFT may be used effectively, as they all showed adequate mitogen response. Patients cannot be risk-stratified based on history to determine the likelihood of positive QFT thus all risk factors questions still need to be collected. Perhaps a larger sample size may clarify this further.

ABSTRACT 12

Trending the APRI (AST to Platelet Ratio Index) in children with cystic fibrosis

Ahmed Erakat MD, Anupama Chawla MD, Catherine Kier MD, Sameer Lapsia MD, Teresa Carney NP

Background: Liver disease is the third most common cause of death in CF patients. Cystic fibrosis-related liver disease (CFLD) is present in approximately 30% of patients with cystic fibrosis. The typical hepatic lesion of CF is focal biliary cirrhosis and is related to the CFTR defect in, which results in biliary hyperviscosity producing bile duct obstruction. Diagnosis of CFLD remains challenging as clinical presentation and can range from steatosis to cirrhosis with portal hypertension with incidence of cirrhosis increasing with age through adolescence. The APRI (AST to platelet ratio index), has been proven to be an accurate measure of liver disease when compared to liver biopsy in adults and children with chronic liver disease resulting from Hepatitis C and Hepatitis B. The APRI is calculated using AST/Upper Limit of Normal AST divided by the platelet count. AST and platelet count are two readily available and inexpensive laboratory values ordered often at routine visits for patients with cystic fibrosis. Thus far, the APRI has been the simplest test using non-invasive markers to be of value in predicting liver fibrosis

Objective: To determine whether there is an increasing trend with age in the APRI value in children with cystic fibrosis.

Study Design/Methods: We started with a retrospective chart review of 73 patients with cystic fibrosis (CF) under the Stony Brook CF Center. Chart review included both online Powerchart system as well as paper chart data gathering. Subsequently a random subset of these patients (n=12) with longevity of data as well as 11 with known liver dysfunction (23 total), as determined by addition of ursodiol to their medication regimen, were reviewed based on set time points (0-35 months; 36-71 months; 72-119 months; 120-155 months; 156- 215 months). Data collected included ALT, AST, Platelets, a calculated APRI, ESR, and CRP. All imaging of the liver was also reviewed. One of the patients reviewed had a liver biopsy.

Results: Several patients in the larger pool of data collection did have data points with elevations in the APRI, however, these elevations always resolved at a subsequent time point. 12/23 (52%) patients in the subsequent review had some form of liver imaging or biopsy. Six of those patients (50%) with known liver dysfunction had some degree of hepatic steatosis. 2 patients had liver fibrosis, one, which was confirmed by biopsy. No trends in the APRI were observed. No patients reviewed had cirrhosis.

Conclusions: No trend was observed in trending the APRI overtime in any subset of the patients reviewed. This includes the patients with liver fibrosis as well as those started on ursodiol. Elevations in liver enzymes, specifically AST, were counterbalanced by a reactive thrombocytosis resulting in largely normal APRI values. Significant elevations in liver enzymes often correlated with an elevated inflammatory marker, and a momentary elevation of the APRI. This lack of an upward trend might be due to Cystic Fibrosis causing multi-system organ dysfunction. A multi-center study that involves liver biopsy and APRI at different time points in patients with cystic fibrosis and with and without known CFLD would be ideal to further study the utility of the APRI.

ABSTRACT 13

Abdominal Pain as the Presenting Sign in a Teenager with Subacute Bacterial Endocarditis: A Case Report

Shanila Perera MD, Laurie Panesar MD

Background: Infective endocarditis occurs less commonly in children than adults; however, the incidence of infective endocarditis in children has increased in recent years. Risk factors for infective endocarditis include cardiac valvular abnormalities, prosthetic valves, rheumatic heart disease, indwelling venous catheters, and prior history of endocarditis. While endocarditis from rheumatic fever has been decreasing, endocarditis secondary to congenital heart disease (CHD) has risen as these patients are now surviving into adulthood. This is a case of a 14 year-old male presenting with 6 weeks of abdominal pain, nausea, and weight loss who was found to have a previously undiagnosed bicuspid aortic valve and subacute bacterial endocarditis.

Case History: The patient presented with 6 weeks of diffuse abdominal pain. Associated symptoms include fatigue, diaphoresis, headaches, arthralgias and an unintentional 10lb weight loss resulting in multiple visits to the pediatrician and ER. His evaluations included infectious etiologies (i.e. EBV and Streptococcal pharyngitis) and GI etiologies (i.e. constipation and gastritis). The history was significant for dental cleaning and extractions 4 months prior to presentation. He had no history of a cardiac murmur, untreated Streptococcal pharyngitis or recent surgery. Physical exam include; a thin, pale and ill-appearing teenager; cardiac auscultation revealed the II/VI SEM at the right upper sternal border and III/IV diastolic murmur at the right upper sternal border radiating to the apex; liver edge was palpable 1cm below the right costal margin; 3+ pulses in the distal upper and lower extremities; and extremities were warm and well perfused.

Laboratory investigations were remarkable for a positive peripheral blood culture which grew *Streptococcus gordonii*, and an elevated CRP. CBC was normal. Abdominal ultrasound showed mild hepatosplenomegaly and reversal of diastolic flow in the descending aorta. Echocardiography revealed a bicuspid aortic valve with prolapse of the right cusp resulting in severe aortic regurgitation. At the time of diagnosis, the left ventricular size and function were normal. He was treated with intravenous Gentamicin for 2 weeks and Ceftriaxone for 6 weeks. He was followed closely as an outpatient with serial echocardiography. Six weeks after discharge he developed left ventricular dysfunction and mitral regurgitation. He was readmitted to Stony Brook for medical management and transferred to Mount Sinai Medical Center for cardiac surgery. He underwent the Ross Procedure and mitral valvuloplasty. In follow up, the patient has no neo-aortic stenosis and mild neo-aortic regurgitation, no mitral valve regurgitation or stenosis, normal left ventricular size and function and no cardiovascular symptoms.

Discussion/Conclusion: Abdominal pain has a broad differential diagnosis spanning many organ systems, with many etiologies of a benign nature. Rarely, however, abdominal pain can be the presenting sign in children with impaired cardiac output. Therefore, a careful review of systems and physical examination is imperative to ensure that a cardiac etiology for abdominal pain is not overlooked.

ABSTRACT 14

Lumbar Punctures Performed by Medical Students: Implementation of a Training Program

Courtney M Rome MD, Maribeth Chitkara MD

Background: The lumbar puncture is a commonly performed diagnostic procedure in pediatrics. Therefore, pediatric physicians should be capable of skillfully performing a lumbar puncture. Recent studies have shown that the use of simulation and instructional video can improve resident knowledge and performance of procedures. In 2004, the Department of Pediatrics initiated a lumbar puncture training session that incorporated an instructional video and hands-on teaching session using for pediatric residents during intern orientation which has shown an improvement in both overall knowledge and personal comfort levels regarding lumbar punctures. There is little published data regarding the initiation of this form of training as early as medical school.

Objective: To pilot a hands-on teaching session for medical students regarding infant lumbar punctures and assess the effectiveness of this session in regards to knowledge acquisition and procedural personal comfort levels.

Design/Methods: Third year medical students in their third year pediatric clerkship at Stony Brook University Hospital were given a pre-test questionnaire prior to the teaching session to assess their baseline knowledge in regard to procedural indications, contraindications, techniques, and overall attitudes. Upon completion of the pre-test, students participated in a two-hour teaching session reviewing the indications, contraindications and complications of the procedure. An instructional video, demonstrating the performance of a lumbar puncture on a pediatric patient was shown. Participants were then instructed to perform a lumbar puncture on an infant manikin using a procedural checklist as a guide. Upon completion of 2-3 lumbar punctures, participants completed a post-test questionnaire, identical to the one used prior to the intervention. A coding system was used to maintain anonymity.

Results: Preliminary data (N = 38) revealed a statistically significant improvement between pre- and post-questionnaires for knowledge (pre-test: mean score of 27.5, post-test: mean score of 37.5, $p < 0.001$). There was no significant difference in pre-test knowledge based on previous experience (mean for 0 prior LPs = 27, 1 prior = 29, 2 prior = 24, $p = 0.27$). Based on a 5 point Likert scale, comfort levels improved anywhere from 0.74 to 1.58 with all measures statistically significant ($p < 0.001$).

Conclusions: Lecture and low fidelity simulation sessions for lumbar puncture led to statistically significant improvement in third year medical students' knowledge and comfort with pediatric lumbar puncture. Comfort levels, while statistically significant, were not markedly improved. This is not unexpected, considering most students have not performed LPs on actual patients. Future research is needed to determine if these interventions during medical school impacts performance in residency.

ABSTRACT 15

Evaluation of parent satisfaction of intranasal midazolam in the pediatric emergency department

Hannah Sneller MD, Carl Kaplan MD

Background: Aerosolized intranasal midazolam (AIM) achieves faster onset and has increased bioavailability due to bypass of hepatic 1st pass metabolism when compared to oral midazolam. AIM is an effective alternative sedation option for minor procedures in children. AIM has been found to be effective in doses ranging from 0.2 to 0.5 mg/kg when used for procedural sedation. The concentrated 5mg/ml injectable form approved by the FDA is used to achieve this dosing.

AIM is currently used in the Stony Brook University Hospital Pediatric Emergency Room. It is delivered using a mucosal atomizer device, which delivers medications via a fine spray over a broad surface area in the nasal cavity. Atomization devices have been assessed in many studies and showed tolerance, safety and efficacy. Klein (2011) conducted a well-designed randomized controlled trials noting more rapid onset of action and superior sedation when midazolam is given intranasally versus buccally or orally.

Although comparative clinical studies have been performed, to date, no publications exist on the parental or patient satisfaction with the intranasal route of midazolam. This route allows for rapid procedural sedation with rapid recovery and no need for injection or intravenous placement, therefore the investigators hypothesize that questionnaire response scores will be favorable.

Objective: The aim of this investigation is to evaluate parent satisfaction for use of AIM prior to minor procedures in the pediatric emergency department.

Study Design/Methods: Parents participated in a survey to evaluate their overall satisfaction with intranasal midazolam used in their child for minor procedures in the pediatric emergency department, including their overall experience in the pediatric emergency department. Simple averages were obtained and standard deviation was calculated.

Results: Parents were surveyed over a 6 month period. The average age of the patient was 2.6 years (SD=1.5). The average time to sedation was 7.8 minutes (SD=8). Overall, parents were satisfied with the medication; 33% (3/9) extremely satisfied and 44% (4/9) satisfied. No parent reported being unsatisfied with the medication. 77.8% (7/9) of parents would allow the medication to be used again in their child. Overall parents surveyed were extremely satisfied with their ER visit (66.6%, 6/9).

Conclusions: Parents reported overall satisfaction with the use of intranasal midazolam for conscious sedation in their children in the pediatric ER. Parents of children receiving AIM were also satisfied with their overall ER visit. Time of onset of medication was similar to previous studies performed in the pediatric population.

ABSTRACT 16

Improving Obesity Management in Primary Care

Orquidia Torres MD, Rosa Cataldo MD, Traci Downs MD

Background: About 17% of children and adolescents in the United States ages 2-19 are obese. The prevalence has been increasing over time and has led to an increase in comorbidities, such as diabetes, sleep apnea, hypertension, and dyslipidemia. Furthermore, childhood obesity increases the likelihood of obesity into adulthood. Since primary care physicians are the main ones caring for these patients, it is important for them to screen BMI and provide counseling. However, many primary care physicians have difficulty managing obesity once it is diagnosed. This may be due to lack of time, training, and/or resources.

Objective: This quality improvement project aims to assess the management of obesity by Stony Brook pediatricians and to improve our practices.

Study Design/Methods: A retrospective chart review of obese children/adolescents ages 10-18yo from 2008-2012 at Tech Park and East Moriches primary care clinic sites. Initial chart review included data from actual paper charts. The data collected included BMI, nutrition/exercise counseling, labs, referral, obesity associated problems, and recommended follow up as documented in well child visits. A didactic session with the primary care physicians was done (October 2013) in an effort to impact physician attention to obesity concerns and action to facilitate change in patient behavior. The session focused on navigating the visit with the topic of obesity, specific counseling recommendations, and referral. After the didactic session, a second chart review was performed. These data were collected from EMR charts. Statistical analysis was performed using Pearson-Chi Square test.

Results: Based on initial chart review, 58% of the charts did not specify the recommendations for nutrition and exercise counseling. Labs were ordered for 66% of patients with BMI >95, but only 8% were referred to a nutritionist. Secondary chart review showed 83% of charts had specific recommendations for nutrition and exercise counseling correlating with the introduction of EMR to the primary care clinic sites, which was statistically significant. In addition, there was statistically significant improvement in the amount of patients referred to the Healthy Weight Center (33%). BMI was documented in all charts for primary and secondary chart review. However, there was no significant improvement in recommendations for follow up visits.

Conclusions: Management of obesity has shifted at Tech Park and East Moriches after the didactic session. There were significant improvements in documentation of counseling and referrals provided. However, the introduction of EMR and development of the Healthy Weight Center have also played a role in physician behavior change. It would be of interest to assess the effect EMR has had on physician management of obesity in a future study.

ABSTRACT 17

Barriers to Medical Care for Families of Children with Autism

Peter VanHeyst DO, Patricia Bigini-Quinn MD, Janet Fischel PhD, Patricia Romanowski Bashe MEd

Background: Families of children with autism spectrum disorder (ASD) face many obstacles to seeking medical care; these include making appointments, transportation, anticipation of negative encounters with healthcare staff, and waiting room etiquette. Barriers to obtaining healthcare for these children contribute to family stress. While the literature identifies many barriers in caring for these children, it is unclear if this is a comprehensive list. Further, it is not known whether prior studies have identified barriers applicable to patients at Stony Brook Children's Hospital (SBCH).

Objective: We sought to identify common roadblocks perceived by families of children with ASD to the utilization of healthcare services at SBCH. The survey targeted the outpatient and inpatient population, with focus on accommodating the child's needs, communication with the family, and quality of care provided by the staff.

Methods: Families surveyed had a child with ASD currently receiving treatment from SBCH aged 5-21 years. A survey was developed from a review of the literature and discussion with practitioners caring for autistic children. Questions required a response based on the Likert Scale (1-5 Scale with 1 being in the affirmative) and free text responses.

Surveys were either mailed with anonymous return envelopes or given via phone. 336 surveys were administered with 63 completed. The mean was calculated for each Likert scale question. Those averaging >2.5 were identified as areas for improvement. Data pertaining to the outpatient setting were separated based on primary care provider, Stony Brook Pediatrics versus community pediatricians.

Results: Results revealed a heavy financial burden to these families. Over 50% reported requiring an additional routine caregiver and 68% indicated a significant reduction in work hours, as well as an average of \$2800 per year in medical costs not covered by insurance.

Inpatient results identified areas for improvement; these included poor management of acute behavior issues (2.9), lack of understanding of ASD (2.6), and overall poor satisfaction (2.8) with hospital care. In addition, free text responses indicated the need for more staffing at the Cody Center (~14%).

Outpatient data revealed that SBCH scored well versus private offices with nearly equal responses in all areas except waiting room time, which lagged slightly (2.2 vs. 1.8 SD 1.1). No deficiencies were identified.

Conclusions: Families of children with ASD face many challenges to the delivery of healthcare. At SBCH there is room for improvement in providing care to these children. Based on our data, we recommend a multi-level training program for hospital staff to foster an understanding of skills to improve healthcare received by hospitalized children with ASD. We further recommend additional social work providers to aid in the procurement/utilization of available resources.

ABSTRACT 18

Perceived Barriers of Transitioning Patients with Neurological Disabilities from Pediatric to Adult Care Medicine

Hina Zaidi MD, Jill Miller-Horn MD, Catherine R Messina PhD

Background: Due to advances in health care, the prevalence of children diagnosed with chronic conditions, such as neurologic disabilities (ND), has increased as they are surviving into adulthood. Transitioning from pediatric to adult health services is potentially stressful and challenging for the caregivers due to unique barriers in this vulnerable population, such as cognitive delays/deficits, psychosocial challenges, and comorbidities.

Objective: To identify perceived barriers of transitioning a child with ND from pediatric to adult services in children cared for at Stony Brook University Hospital (Long Island, NY). Once identified, it will be helpful to address these barriers with the goal easing the transition and decreasing caregiver stress.

Study Design/Methods: Surveys were provided to caregivers of children with a ND in inpatient and outpatient departments from July-Dec 2013. Questions addressed patient's gender, ND and complexity, cognitive level, transition barriers, desire to transition and physician transition initiation discussion. There were N=39 completed surveys (40% response rate). Data were analyzed using SPSS.

Results: The cohort consisted of 56% male and 44% female, ages ranged from 14-24 years, mean=17 years, SD=2.43 years. Most visited the neurology clinic 2-5x/year (74%), with a majority living with parents at home (95%). The greatest proportion of children had a seizure disorder (35.9%) followed by headaches/migraines (33.3%), ADHD (23.1%), multiple sclerosis (20.5%), other condition (17.9%), cerebral palsy (7.7%), genetic/metabolic disorder (5.1%), and spina bifida (2.6%). Almost half (46%) were mostly or totally dependent on parent for daily care. Caretakers reported 1-2 barrier concerns (54%), >2barrier concerns (28%), or no barrier concerns (18%). The most identified barriers were transitioning not discussed by PMD/neurologist as well as fear of trusting new doctors (both 33.3%). Only 25% subjects had some transition initiation discussion by their physician. Having a child with a complex neurologic condition or comorbid non ND problem was not associated with an increase in number of perceived barriers, but caretakers reported more stress over transitioning a complex child (33.3%) compared to a child with a simpler medical condition (12.5%). Caregiver stress was higher if the child had cognitive delays (57.1%) versus cognitively normal (42.9%). Those caretakers with a child that had cognitive challenges, had increased barrier perceptions (4) compared to those with children of normal cognition (2).

Conclusions: The difficulty in transitioning care for children with ND is related to caregiver fear of trusting a new physician, and lack of physician initiation discussion. Cognitive delays rather than complexity of the child's medical condition worsen caregiver barrier perceptions, but both affect the level of parental stress. Increased efforts in discussing this transition with caretakers, and in providing reassurance and referrals for adult care, can help to ease the transition and decrease caregiver stress.

ABSTRACT 19

Design of an Electronic Caregiver Survey for Adolescent Obesity Intervention

Josette Bianchi-Hayes MD, Elinor Schoenfeld PhD, Rosa Cataldo DO MPH, Susmita Pati MD MPH

Background: Childhood obesity is a national healthcare epidemic with a prevalence of 16.9%. The emerging role of technology in health provides a wealth of potential strategies to address complex and chronic health problems, like childhood obesity. The growing field of health technology includes devices and applications for patients and their providers to manage diseases, including social networks, self-tracking, and personally controlled health records. This study's parent/caregiver survey is the first step in the process of developing and pilot testing a technology-based intervention for adolescent obesity.

Objective: To determine parental/caregiver attitudes towards using mobile health applications and devices to address childhood obesity through surveys completed in weight management and pediatric clinics. Results from these surveys will help us better understand current adolescent practices and determine the comfort level of parents to implementing a technology focused intervention.

Methods: After review of the literature to evaluate existing studies of technology use in the family and adolescent weight concerns, we developed a survey to address our study aims that could be self-administered using standard survey questions when possible. We provided a draft of the survey to K30 Clinical Scholars, friends, and healthcare providers to obtain survey design and content feedback. Based upon feedback the survey was streamlined and prepared for electronic data capture using a tablet. StudyTRAX was used for programming of the data capture form and for data storage. We recruited and trained 3 student research assistants for consenting/assenting participants, recruitment and survey completion. Recruitment and data collection began in April 2014. The study goal is to have 150 surveys completed within a 6 month period. Knowledge gained from these surveys will serve as the foundation for our scripted interviews and focus group discussions for intervention development.

Results: Utilizing colleagues and friends to critically evaluate the survey prior to implementation proved invaluable. The redesigned and streamlined survey lends itself to self-administration on a tablet device. A manual of procedures and a protocol were developed to aid in training and standardization for consenting and data collection across interviewers. A codebook was created for use in software programming and to ensure standardized data export for analysis in SPSS and SAS. IRB approvals were secured within 3 months of study start-up keeping us on track for survey completion.

Conclusions: Strong methodology and a solid study team are key elements to successfully creating and implementing a survey of weight management issues among parents of adolescents. Extensive preparatory work including literature review, colleague feedback, interviewer training, and instrument testing contributes to better survey content, and ease of data collection.

ABSTRACT 20

The Impact of an interactive Computer Application on the Quality of Colonoscopy Preparation, Overall Patient Satisfaction and Outpatient Ambulatory Center Efficiency

James Brief MD, Anupama Chawla MD, Jeffrey Morganstern MD, Anupa Dalal DO

Background: Inadequate cleansing or bowel preparation prior to a colonoscopy significantly reduces the diagnostic sensitivity of the procedure. Studies have shown that patients often find the preparation confusing or stressful, which itself can increase patients' anxiety and decrease their overall satisfaction with the procedure. Several efforts have been made in recent years to utilize technology to help alleviate these problems. A recent study demonstrated that video tutorials can improve the quality of colonoscopy preps. The software will begin with a video tutorial of the colonoscopy preparation process. Using audio and visual alerts, the program will remind patients in real time when to take certain medications and at what specific dosages. The software also asks patients questions during the process. Based on these answers, it can provide patients with important information that will optimize their preps. Finally, the software will inform parents of when and where to report on the day of their child's procedure. To date, there has been no research investigating the effect of an interactive software application on colonoscopy cleanliness, patient satisfaction, and its impact on the overall efficiency of the ambulatory endoscopy service.

Methods: Fifty patients, aged 1-21, scheduled to undergo a colonoscopy will be randomly assigned to either receive standard written instructions or software to guide them through the colonoscopy prep process. Exclusion criteria include patients who have previously undergone a colonoscopy procedure or patients requiring non-standard preparation materials. The Boston Scoring Scale, a validated measurement tool for quantifying colonoscopy cleanliness will be used on all patients to grade the quality of their preps. Patient satisfaction will be measured by means of a standardized scale. The number of calls made by patients to the gastroenterology service will be tabulated in each group. Finally, patient punctuality will be measured by reviewing sign-in times at the outpatient suite.

Discussion: Although this application is currently in the initial phase of development, the goal of this interactive, multimedia software is to empower patients with information regarding their colonoscopy and allow them to have a "virtual gastroenterologist" by their side for the entire duration of their colonoscopy prep. If this study shows a significant improvement in colonoscopy cleanliness, patient satisfaction, patient punctuality and number of phone calls to the gastroenterologist, then further studies evaluating similar application settings in different aspects of medicine should be considered.

ABSTRACT 21

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

Sehar Ejaz MBBS, Andrew Lane MD, Thomas Wilson MD

Background: Thelarche is generally the first sign of puberty in a female. Menarche is achieved at Tanner IV breast development. Isolated premature menarche is defined as cyclic vaginal bleeding in a prepubertal female in the absence of appropriate secondary sexual characters. It is considered a benign phenomenon. However, there is sparse data of long term follow up. This condition still raises great concern, which may lead to unnecessary treatment.

Objectives: To explore the pubertal and auxological outcome of patients with isolated premature menarche.

Methods: Records of patients seen between 1982 and 2013 meeting ICD9 codes 259.1, 641.9, 626.0, 626.9 were screened. Patients were interviewed on telephone using an IRB approved questionnaire.

Inclusion Criteria

1. Ages 6 months - 10 years at the time of initial presentation with premature menstrual bleeding in the absence of appropriate secondary sexual characteristics.

Exclusion Criteria

1. Patients with true precocious puberty or a pathological cause of vaginal bleeding

Results: 4441 patients were identified. 24 met the criteria for isolated precocious menarche. One was excluded because of McCune Albright Syndrome. 19/23 were contacted and participated in the questionnaire. The remaining 4 were not reachable. Of the 19 who participated, 14 have completed puberty and achieved final height. 5 have still to complete puberty. 4 of 14 girls continued menses into puberty which has not been reported in previous studies. The remaining 10 achieved pubertal thelarche and menarche at a normal age. 50% girls reported irregular menstruation as an adult. 13/14 achieved or exceeded mid-parental target height. None of the patients, who attempted conception, reported any fertility issues.

Conclusion: Our data confirms that isolated premature menarche is a benign entity. Although most of these patients tend to few isolated episodes of menses that stop on their own, some may continue to have periods into adult hood. Unlike true puberty, these patients don't have any advancement in their bone ages. It does not seem to cause any fertility or stature issues. Once the true precocious puberty is ruled out, these children should be monitored periodically and families should be reassured.

ABSTRACT 22

Brief exposure to hyperoxia suppresses surfactant proteins in lungs of lipopolysaccharide exposed newborn rats

Jagadish Elumalai MD, Esther Speer MD, Avinash Chander PhD

Background: Perinatal infection and oxygen toxicity can independently cause acute lung injury, resulting in airway and lung parenchymal inflammation and subsequently altered structural and functional lung development. The acute and chronic effects of hyperoxia in the presence of underlying infection in newborn infants however are still poorly understood.

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

Design/Methods: A total of sixty five Sprague-Dawley rat pups (2 days old) from six pregnant rats were used for studies reported here. Pups from each dam were randomized into two groups to receive intranasal LPS (10 μ g/5 μ l) or normal saline. After 24hrs, three dams with their pups were exposed to hyperoxia (100% O₂ for 6 hrs) and the other three dams with their pups were kept in ambient air. Thus, the four groups included controls (n=13), intranasal LPS only (n=17), hyperoxia only (n=17), and combined LPS and hyperoxia (n=18). At three time points, postnatal day (PN) 3 (n=34), PN14 (n=16) and PN21 (n=15) rat pups were euthanized and lungs harvested. Real-time PCR was performed with custom-made TaqMan array plates 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. P values < 0.05 were considered statistically significant. To evaluate inflammation, lung sections after formalin fixation and paraffin-embedding were subjected to hematoxylin-eosin and immunostaining to detect myeloperoxidase positive cells. Western blot was done to study surfactant protein A & B expression.

Results: All results reported are in comparison to the control group. On PN3 Macrophage Inflammatory Protein-1 α gene was upregulated only in the combined group; Myeloid Differentiation Primary Response gene-88, Surfactant Protein A1, Catalase and NADPH oxidase genes were downregulated in hyperoxia group. On PN14 the Surfactant Protein B (SP-B) was downregulated in all experimental groups and Nitric Oxide Synthase was downregulated only in the combined group. By PN21 all the genes studied returned to control values. Histology and immunohistochemistry showed minimal infiltration with inflammatory cells in all the experimental groups on PN2, but not at later time points. Western blot showed reduced expression of the mature fraction of SP-B on PN2 (all experimental groups) and PN14 (combined group only), which returned to control levels by PN21.

Conclusions: Low level inflammation caused by short-term hyperoxia and/or low dose LPS in newborn rats affects lung development as shown by suppression of surfactant protein A and B mRNA levels and protein expression.

ABSTRACT 23

Reducing Unplanned Extubations in the Neonatal Intensive Care Unit with NeoBar Usage

Bianca Fornier MD, Aruna Parekh MD, Sharon Close RRT, Tram Dang NNP, Esther Speer MD

Background: Unplanned extubations are a major risk factor for immediate hemodynamic and respiratory instability and complications, cardiopulmonary resuscitation and long term adverse outcomes in NICU patients. Unplanned extubations requiring reintubation are the fourth most common adverse event in NICUs in the United States. Vermont Oxford Network published rates for unplanned extubations within NICUs are between 2 and 4.8 per 100 ventilator days, whereas our NICU encountered 8.9 events per 100 ventilator days from Nov to Dec 2012.

Objective: As part of a NICU QI initiative, a multidisciplinary team designed and implemented interventions to standardize endotracheal tube (ET) securement using the NeoBar (a commercially available ET holding device) with the goal to reduce unplanned extubations.

Methods: We standardized our practice of ET securement using the NeoBar as preferred method. We designed an online learning module for NeoBar usage, which was used for NICU staff training, followed by practice sessions on manikins. Protocols detailing the documentation of indication for intubation, reasons for extubation, holding device used and position of ET were implemented.

Upon completion of staff training in summer 2013, we compared the following data before and after our interventions: (1) unplanned extubation rate (obtained from daily IHI forms) (2) NeoBar usage rate (prospective observation) (3) ET position documentation on patient records (4) x-ray confirmation of ET position (tip of ET at mid-trachea at least 1 cm above the carina) (5) nursing satisfaction with the NeoBar using a survey.

Results: There were a total of 78 ventilator days during the same study period in Nov/Dec 2012 and 391 ventilator days in Nov/Dec 2013. Unplanned extubations decreased from 8.9 to 6.1 per 100 ventilator days. NeoBar usage increased from 76% to 90%. Nursing surveys showed increased acceptance of the NeoBar (from 23 to 50%) compared to standard taping, and 100% of our staff felt adequately trained in its use. Electronic documentation of respiratory care sets were implemented in 2013. The documentation compliance rate for ET positioning was over 90%, however details of reasons for reintubations and adjustment changes were inconsistently documented. X-ray confirmation of ET positioning (number of times in correct position/imaging of ET) increased from 67% to 71%, but correct positioning of the infant on x-rays (as defined by head and chest in midline) decreased from 80% to 65%.

Conclusions: Standardizing of ET securement using the NeoBar as the preferred method and conducting staff training decreased our extubation rates from 8.9 to 6.1 per 100 ventilator days. However, in order to achieve the Vermont Oxford rates of unplanned extubations, ongoing staff training, detailed documentation of ET position, and improved x-ray techniques are needed.

ABSTRACT 24

Most Appropriate Screening Test Strategy in Pediatric Urinary Tract Infections

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Objective: Use of rapid screening tests in the diagnoses of childhood urinary tract infection (UTI) is not only significant in early institution of empiric antibiotics in order to prevent the sequela of pyelonephritis but also in potentially sparing unnecessary antibiotic use.

We sought to look at the performance characteristics of these tests in two age groups: infants and children < 24 months and older children $\geq 2 \leq 18$ yrs of age.

Methods: We retrospectively reviewed results of all appropriately collected urine cultures from January 1st through August 8th, 2013. We studied the results of automated urinalysis done with IRIS (leukocyte esterase [LE], nitrite, pyuria [>5 WBC/HPF], hematuria [>1 RBC/HPF], bacteriuria, presence of epithelial cells) and compared with urine cultures results with **i**) growth of a single uropathogen with colony count $\geq 50^3$, **ii**) colony count $\geq 10^3 < 50^3$, **iii**) contaminants (> 3 organisms, or coagulase negative *Staphylococcus*, *Lactobacillus* spp., *Corynebacterium* spp.) and **iv**) cultures with no growth.

Results: We have reviewed 526 culture results. Of the 266 positive culture; 38 % had a single uropathogen with colony count $\geq 50^3$, 9 % had a single uropathogen with colony count $\geq 10^3 < 50^3$, 53 % were regarded contaminants.

Microbiology: 89 % gram negatives (*E.coli* was the most common gram negative 76%, followed by *P. mirabilis* 8% and *K. pneumoniae* 3%) and 11 % were gram positives (*E. faecalis*, *E. faecium*, *S. saprophiticus*, and group B streptococcus). Susceptibility of uropathogenic *E.coli* to ampicillin, Bactrim and ciprofloxacin was 42 %, 65 % and 97 % respectively.

Test Performance of automated urinalysis:

In children ≤ 24 months of age, automated LE and bacteriuria had high sensitivity for detecting UTI, but LE was more specific. Pyuria was less sensitive than LE.

In children $> 2 \leq 18$ years of age, LE and pyuria were the most sensitive screening tests but the LE was less specific in this age group. The specificity of LE improved if only moderate-large reactions were considered. Bacteriuria was less sensitive in the older age group.

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New York State School Nurses' Comfort and Knowledge Caring for Students with Diabetes Mellitus: A Cross Sectional Study

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Background: The number of school-aged children with diabetes (DM) is rising. Management of DM quickly advances with the frequent introduction of new medications and delivery technologies. While school nurses (SN) assume responsibility for the management of their students with DM, the resources to educate SN on these advancements are variable and limited. To our knowledge, our research is the first large scale study to investigate SN comfort and knowledge in caring for students with DM and explore resources utilized by SN to expand their education.

Objectives: 1. To assess SN knowledge and comfort regarding DM management 2. To better understand SN current experience in managing students with DM and identify areas and/or skills that SN feel they need more training in. 3. To assess SN preferences to learn about DM treatment.

Design/Methods: A 44-question survey assessing SN knowledge and comfort regarding DM, inquiring about SN learning preferences, and exploring SN day to day management of students was developed. The questionnaire was reviewed by 3 pediatric endocrinologists and 2 school nurses for content and clarity before distribution. IRB approval was obtained to distribute the survey anonymously online via Qualtrics to members of the New York State Association of School Nurses. Once the survey was posted, SN were given a six week time period to respond.

Results: 170 SN across NY state completed the survey. 91% were from public schools and 70% cared for elementary school aged children. 77% of responders had at least one student taking insulin. Knowledge and comfort scores were calculated. The mean knowledge score was 12.1 +/- 4.2 (max 18). The mean comfort score was 57.3 +/- 20.8 (max 84). SN felt least comfortable with changing an insulin pump site, trouble shooting an insulin pump, and understanding continuous glucose monitors (CGMs). Only 10% strongly agreed that they were knowledgeable about the latest DM technologies. While SN use a wide variety of resources, 57% prefer local conferences as their education source.

Conclusions: As insulin pumps and CGMs are being used more and more frequently to manage students' diabetes, it is important that SN feel comfortable in their use. Programs need to be developed to provide SN hands-on experience with these technologies in addition to reviewing the fundamentals of diabetes pathophysiology and treatments.

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Professionalism in the Pediatric Workplace: A Qualitative Analysis

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Background: Recent attention has focused on the need to teach professionalism and identify and remediate unprofessional behavior in the healthcare industry. To advance our understanding of areas for intervention, a multidisciplinary committee in a pediatric academic medical center was convened to investigate the role professionalism plays in the workplace.

Objective: To understand perceived breaches in professional conduct by health care providers in the pediatric workplace.

Design/Methods: An anonymous electronic survey of pediatric faculty, nursing, trainees, and clerical staff was performed. Respondents were asked to comment on experiences regarding perceived breaches of professional behavior during clinical work. Survey responses were analyzed qualitatively to identify themes and generate specific theories about participants' experiences and implications for their practice.

Results: 372 out of 813 (46%) responded. Of these, 6% were excluded because they rarely work with pediatric patients. 11% did not complete the entire survey. Of 282 respondents, 39, 28, 23 and 7% represented the following groups: faculty, nursing, trainees, and clerical staff. More than 60% of respondents were female; 80% were ≥ 30 yrs old; 14% had worked at this institution < 1 yr.

128 respondents reported witnessing breaches of professionalism and 23 reported personal breaches of professionalism. Narrative analysis of all responses is represented in the word cloud (Figure 1). High level categories of non-professionalism were interprofessional communication, aggressive behavior, compliance (e.g. HIPPA), vulgar or loud talking, and unprofessional communication to patients or families. 20% of the thematic categories identified issues with compliance and communication.

Conclusion: As the qualitative analysis supports, targeted interventions to improve communication and minimize aggressive behavior in pediatric healthcare merit serious consideration.

Figure 1:

