Pediatric Research Day

A Showcase for Residents and Fellows

Wednesday, May 29, 2019
8 am to 1 pm
Charles B. Wang Center

Stony Brook Children's

Stony Brook Children's

SCHOOL OF MEDICINE
DEPARTMENT OF PEDIATRICS

Carolyn Milana, MD
Interim Chair, Department of Pediatrics
Associate Professor of Clinical Pediatrics
Medical Director for Quality
Stony Brook Children's Hospital

May 29, 2019

Welcome to our 11th annual Pediatric Trainee Research Day. It is a pleasure to share with you 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 variety 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 this year's Organizing Committee (Drs. Fischel, Lane, Mintzer, and Pati) for coordinating the day. Also, we appreciate the entire faculty who have served as mentors to provide guidance and encouragement to our trainees.

Sincerely

Carolyn Milana, MD
Associate Professor of Clinical Pediatrics
Interim Chair, Department of Pediatrics
Medical Director of Quality, Stony Brook Children's Hospital

2019 PEDIATRIC RESEARCH DAY
WEDNESDAY, MAY 29TH
8 AM – 1:00 PM
CHARLES B. WANG CENTER

8:00 – 8:30 **REGISTRATION AND BREAKFAST** – Theater Lobby
8:30 **WELCOME AND CHAIR'S OPENING REMARKS** - Dr. Carolyn Milana– Main Theater
8:35 **KEYNOTE ADDRESS** – Main Theater
INTRODUCTION OF KEYNOTE SPEAKER – Dr. Andrew Lane
8:40 – 9:30 **KEYNOTE SPEAKER: JONATHAN DAVIS, MD**
Chief of Newborn Medicine
Professor of Pediatrics, Tufts University School of Medicine

"Challenges and Opportunities for Global Drug Development in Neonates"

PLATFORM PRESENTATIONS – Main Theater

SESSION 1 (9:30-10:00)
9:30 **INTRODUCTION OF INVITED JUDGES – (**Session Chair **-** Dr. Susmita Pati)

9:35 - 10:00 **RESIDENTS PLATFORM PRESENTATIONS**
ASHWIN AGRAWAL, DO "The Effect of Exercise Intensity on Cardiovascular Health and Body Composition in Children Who Are Overweight or Obese: A Pilot Study"

MOHAMMED IBRAHIM, MD "Validation of the Hypoglycemia Scoring System: A Tool to Identify Infants of Diabetic Mothers Who Will Not Require Intravenous Dextrose Infusions"

10:00 – 10:15 **COFFEE BREAK** - Theater Lobby

SESSION 2 (10:15 – 11:10)
10:15 - 10:35 **PEDS TALKS** (Introduced by Dr. Marian Evinger)
ROBERT GRELL, MD "Right Decisions, Wrong Outcomes and Relearning to Trust Yourself"
JOHN STRAND, MD "VORTEX"

10:35 – 11:00 **FELLOWS PLATFORM PRESENTATIONS** (Session Chair – Dr. Janet Fischel)

CHRISTAL ACHILLE, MD "Longitudinal Impact of Gender-Affirming Endocrine Intervention on the Mental Health and Well-Being of Transgender Youths"

NARENDRA YALLANKI, MD "Interobserver and Intraobserver Variation in Interpretation of Fecal Loading on Abdominal Radiographs in Children"

11:05 – 12:05 **POSTER SESSION** - Theater Lobby (Session Chair – Dr. Jonathan Mintzer)
Invited Judges plus Drs. Mintzer and Pati

12:10 – 1:00 **LUNCH** – Zodiac Gallery
Dr. Davis to discuss his academic career path
Presentation of Awards and Closing Remarks by Dr. Milana

Keynote Speaker Biography

Jonathan Davis, MD

Chief of Newborn Medicine
The Floating Hospital for Children
at Tufts Medical Cneter
Professor of Pediatrics
Tufts University

Our keynote speaker, Dr. Jonathan Davis launched his clinical training in 1981, earning his Medical Doctorate from McGill University. His residency in pediatrics at Boston Children's Hospital was followed by fellowship in neonatology at the Children's Hospital of Philadelphia.

Dr. Davis's academic career began when he joined the Division of Neonatology at Strong Memorial in Rochester, New York, in 1986 and shortly afterwards became medical director of their neonatal intensive care unit and neonatal pulmonary function laboratory.

Dr. Davis was recruited to Long Island in 1991 as director of neonatology and the CardioPulmonary Research Institute for Winthrop-University Hospital. Dr. Davis also became a familiar face to trainees at Stony Brook as he was likewise appointed to our own Pediatrics faculty. In 2006 Dr. Davis was recruited to be Chief of Newborn Medicine at the Floating Hospital for Children at Tufts Medical Center in Boston and now serves as Professor and Vice-Chair of Pediatrics.

As Director of Tufts' Clinical and Translational Research Center and their National Translational Science Institute, Dr. Davis is currently Principal Investigator of an $8 million grant to study Precision Medicine in the Diagnosis of Genetic Disorders in the Neonate. This groundbreaking multi-site study compares cost-effectiveness and accuracy of targeted vs whole genome sequencing in 400 neonates with possible genetic disorders. Dr. Davis also chairs both the NIH Child Health Oversight Committee and the Neonatal Advisory Committee in Pediatric Therapeutics at the Food and Drug Administration.

Jonathan Davis' remarkable career in research and academics has contributed tremendously to our understanding of neonatology, especially pulmonary physiology and treatment for neonatal abstinence syndrome. Additionally, Dr. Davis' stellar research impact has likewise been matched by his legislative efforts not only to modernize HIV testing laws in Massachusetts and to increase Congressional funding for NIH, but especially to advocate for protections for opioid-exposed neonates.

Abstracts

Abstract Number

Resident Platform Presentations

Fellow Platform Presentations

Resident Posters

Fellows Posters

ABSTRACT 1.

THE EFFECT OF EXERCISE INTENSITY ON CARDIOVASCULAR HEALTH AND BODY COMPOSITION IN CHILDREN WHO ARE OVERWEIGHT OR OBESE: A PILOT STUDY

Ashwin Agrawal DO[1], MA, Sharon Martino PT, PhD[2], Raymond McKenna PT, PhD[2], Peter Morelli MD, FACC[1]

[1] Department of Pediatrics, Stony Brook Children's Hospital, [2] School of Health Technology and Management, Stony Brook University,

Background: Pediatric obesity is an epidemic in the United States. Obesity-related endothelial dysfunction originates in childhood and is a precursor for atherosclerosis. In addition, altered body composition such as increased abdominal adiposity and neck circumference have been linked to cardiovascular disease. Exercise and healthy diet attenuate these risk factors. Adult studies have demonstrated that High Intensity Interval Training (HIIT) confers greater cardiovascular and weight loss benefits compared to Moderate Intensity Continuous Training (MICT). However, the ideal intensity for effective weight loss and improved cardiovascular health in overweight/obese (OW/OB) children is not clear.

Objectives: To explore in OW/OB children 1) the feasibility of conducting a 10-week HIIT program including determinations of body composition and vascular ultrasound, and 2) the effects of HIIT versus MICT exercise intensity on anthropometric measurements, body composition and endothelial health in these children.

Methods: Children (matched for age and sex) were randomized into two groups: HIIT group (n=14) and MICT group (n=14). Each group participated in a 10-week exercise and nutritional education program. Anthropometric measurements, vital signs, body composition (BodPod™), 3-D imaging (Styku™), cardiovascular endurance, and endothelial health (flow mediated dilation) were measured prior to and at the completion of the program. Heart rate monitors were utilized to ensure participants reached target heart rate goals for both HIIT and MICT. Flow mediated dilation was analyzed by a blinded third party.

Results: The HIIT group showed a mean decrease of 1.84 ± 2.2% body fat (p=0.26) while the MICT group showed a mean decrease of 2.2 ± 3.4% body fat (p=.046). Additionally, cardiorespiratory endurance improved in both the HIIT group and MICT group (HIIT mean Δ 25.3 bpm, $p<0.05$, MICT mean Δ 12.8 bpm, p=0.047). Body weight remained stable for both groups. Flow-mediated dilation analyses to measure vascular function are currently in progress.

Conclusions: A 10-week HIIT and MICT program combined with nutritional education improves body composition and cardiovascular endurance in OW/OB children, ages 8-17. The use of HIIT exercise regimen is safe and feasible for this group. Future studies with larger sample sizes are needed to elucidate the benefits of different exercise intensities on promoting cardiovascular health in this population.

ABSTRACT 2.

VALIDATION OF THE HYPOGLYCEMIA SCORING SYSTEM: A TOOL TO IDENTIFY INFANTS OF DIABETIC MOTHERS WHO WILL NOT REQUIRE INTRAVANEOUS DEXTROSE INFUSIONS

Mohammed Ibrahim MD[1], Joseph Decristofaro MD[1], Wei Hou PhD[1], Echezona Maduekwe MD[1]

[1]Stony Brook University School of Medicine, Stony Brook, NY

Background: Neonatal hypoglycemia (NH) is common with an incidence of 66% in those with risk factors and is a leading cause of NICU admissions. Although NH is easily treatable, delays in identification and treatment may cause significant long-term neurodevelopmental sequelae. The Hypoglycemia Scoring System (HSS) developed at the University of Rochester, NY, provides an objective measure to differentiate asymptomatic infants of diabetic mothers (IDMs) ≥35 weeks gestational age (GA) who will need intravenous dextrose infusion (IDI) from those who will not. The HSS was developed for the neonatal population but has not been validated. We, therefore, aimed to validate the HSS in a cohort of IDMs.

Objective: To evaluate reliability of the HSS in the identification of IDMs ≥35 weeks GA who will not require IDI post-delivery. We hypothesize that the HSS will clearly identify asymptomatic IDMs ≥35 weeks GA who will not need IDI post-delivery.

Methods: A retrospective review was performed among hypoglycemic IDMs ≥35 weeks GA admitted to Stony Brook Children's Hospital newborn nursery and NICU between January 2015 and December 2017. HSSs includes maternal age, maternal pre-delivery glucose, neonatal weight, and neonatal glucose within 1 hour of life. A total score of 0-1 identifies infants unlikely to require IDI, whereas a score of 2-5 indicates those at higher risk for IDI. Sixty-five subjects were reviewed to achieve a sensitivity of 95% with a 15% margin of error and a specificity of ≥80% at a two-tailed alpha of 0.05. Unpaired t-test and multiple logistic regression were used for analyses.

Results: Sixty-five neonates with mean (± SD) GA 38 weeks (±3 days) and mean birth weight 3200 (±100) grams were included. Twenty-four infants (37%) scored 0-1, and forty-one (63%) scored 2-5 with a female to male ratio of 1.03:1. The hypoglycemia score area under the receiver operating characteristic curve was 0.977, indicating good separability. Positive and negative predictive values were 0.49 and 0.88 respectively. There were increased odds of scoring 2-5 with females (95% CI 1.23-24.4, p=0.03), delivery by C-section (95% CI 1.02-1.85, p=0.047), and an increase in maternal pre-delivery glucose (95% CI 1.01-1.11, p=0.02).

Conclusion: Among IDMs, HSS scores are highly associated with potential need for IDI. Neonates with a total score of 2-5 immediately post-delivery should be monitored closely for hypoglycemia as they may need IDI.

ABSTRACT 3.

LONGITUDINAL IMPACT OF GENDER-AFFIRMING ENDOCRINE INTERVENTION ON THE MENTAL HEALTH AND WELL-BEING OF TRANSGENDER YOUTHS

Christal Achille MD[1], Tenille Taggart MA[2], Nicholas Eaton PhD[2], Jennifer Osipoff MD[1], Kimberly Tafuri DO[1], Andrew Lane MD[1] and Thomas A. Wilson MD[1]

[1]Division of Pediatric Endocrinology, Department of Pediatrics and [2]Department of Psychology, Stony Brook University, Stony Brook, New York

Background: Transgender youths experience high rates of stigma and discrimination. Combined with developing secondary sex characteristics, these factors contribute to poorer mental health, depression and increased suicide attempts/completions. Previous studies indicate that endocrine and/or surgical interventions are associated with improvements to mental health in adult transgender individuals. Little is known about these interventions' impact on transgender youths in the USA.

Objective: To examine the effect of endocrine intervention in transgender youths (either suppression of endogenous pubertal hormones utilizing GnRH agonists/anti-androgens/suppressors of menstruation, or addition of cross-sex hormones) on depression and quality of life scores over time.

Methods: Longitudinal impact of endocrine intervention in transgender youths (aged 9-21) across three waves of data was investigated. At approximately 6-month intervals, participants completed mental health assessments and parents completed the Nisonger Child Behavior Rating Form (NCBRF-TIQ). To assess endocrine treatment effects, a subsample of participants who were naïve to endocrine treatment at baseline (Wave 1: N = 95; Wave 2: n = 66; Wave 3: n = 50) was studied. The study used linear and logistic regression to compare outcomes between transgender youths who began and never began endocrine treatment at subsequent waves.

Results: Female to male subjects (FTM) on any endocrine treatment reported significant reductions in Wave 3 depressive symptoms (ps < .05). On the NCBRT-TIQ, FTM on hormone suppression scored lower on the Overly Sensitive factor (p = .05), while FTM on any endocrine treatment scored lower on the Oppositional factor (p = .04). Male to female subjects (MTF) on hormone suppression and any endocrine intervention reported significant reductions in depression at Waves 2 and 3 (ps < .05). On the NCBRT-TIQ, MTF on cross-sex steroids scored significantly lower on the Oppositional (p = .02) and Withdrawn/ Dysphoric (p = .04) factors, and they scored significantly lower on the D-Total factor (p = .02) — a composite of the Disruptive Behavior Disorder Subscales.

Conclusion: Endocrine intervention can improve depression and behavior in transgender youth. Our study suggests that endocrine intervention is associated with reduced problem behaviors. This effect was observed in both MTF and FTM, but gender and type of intervention were associated with different outcomes. These preliminary findings suggest that endocrine intervention may be beneficial for transgender youths, similar to their positive associations in transgender adults.

ABSTRACT 4.

INTEROBSERVER AND INTRAOBSERVER VARIATION IN INTERPRETATION OF FECAL LOADING ON ABDOMINAL RADIOGRAPHS IN CHILDREN

N. Yallanki MD[1], L. Milla MD[2], L. Small-Harary MD[1], and A. Chawla MD[1]
[1]Division of Gastroenterology and [2]School of Medicine, Stony Brook University, Stony Brook, NY

Background: History taking and physical examination constitute the most important steps in the diagnosis of functional constipation. However, when the diagnosis is doubtful, several tests have been used to distinguish between the presence or absence of constipation, one which is abdominal radiography. Current North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) guidelines do not support the use of abdominal radiography in establishing the diagnosis of constipation. Despite these recommendations, abdominal radiography is often performed. In many cases aggressive laxative therapy is initiated and referrals to gastroenterology are made based on results of the radiograph.

Objective: The primary aim of this study is to evaluate the interobserver and intraobserver variation between multiple providers in interpretation of fecal loading on abdominal radiographs in children.

Study Design and Methods: This is a retrospective research study done at Stony Brook Children's Hospital. The electronic medical records of 100 children seen for abdominal pain and/or constipation who had an abdominal radiograph performed in ER were consecutively selected (from years 2014-2018), and radiographs were downloaded for review. Four physicians from each specialty including Pediatric GI, Radiology and Pediatric Emergency Medicine (total of 12 interpreters from 3 specialties) interpreted the radiographs independently. Initially subjective interpretations were obtained, later the same physicians were asked to interpret the same radiographs to measure intraobserver variation. Each observer reported interpretation findings as normal, mild, moderate or severe constipation. Consistency between interobserver and intraobserver ratings of radiographs interpretation were evaluated using the Kappa coefficient (ranges from 0 to 1.0 (no agreement to perfect agreement).

Results: Kappa Coefficient values showed a free margin kappa of 0.21 and 40% overall agreement among12 observers. Intradepartmental comparisons showed an overall agreement of 41.5%, 36.7% and 47.3% in GI, EM and Radiology respectively. Intraobserver Kappas to look for reproducibility showed significant variability ranging from 0.11 to 0.64 with 33.3% to 73.4% agreement.

Conclusion: Kappa coefficients showed only poor to fair agreement among the 12 observers (40 %) and poor consistency with significant variability among providers when same X-rays were presented again. Our study supports the current recommendation of NASPGHAN of not to rely on abdominal x-rays for establishing the diagnosis of constipation. Reliability of X-rays for diagnosis and grading the degree of constipation is questionable given only poor to fair agreements for both interobserver and intraobserver comparisons.

KAPPA COEEFICIENT VALUES	INTEROBSERVER AGREEMENT AMONG ALL PROVIDERS	INTRADEPARTMENTAL INTEROBSERVER AGREEMENT		
		PEDS GI	PEDS EM	RADIOLOGY
Overall agreement	40.8%	41.50 %	36.67 %	47.33 %
Free margin Kappa	0.21 (0.18-0.24)	0.22 (0.15-0.29)	0.16 (0.09-0.22)	0.30 (0.23-0.37)
Fixed Margin Kappa	0.18 (0.17-0.20)	0.21 (0.16-0.25)	0.11 (0.06-0.17)	0.26 (0.20-0.31)

ABSTRACT 5.

USE OF THE OXIPNEUMOGRAM STUDY TO DIAGNOSE GASTROESOPHAGEAL REFLUX IN SYMPTOMATIC INFANTS IN THE NICU: A RETROSPECTIVE STUDY

Tova Chein DO, Suzan Katz DNP, Echezona Maduekwe MD, Doreen DeMeglio DNP, and Joseph D Decristofaro MD.
Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY, USA

Background: Gastroesophageal Reflux (GER) is a common NICU diagnosis that may be associated with apnea/desaturations. Accurate and rapid diagnosis of GER is necessary to minimize complications associated with anti-reflux medications in neonates. Although an MII-pH Study (impedance study) is the gold standard for the diagnosis, its limitation is the prolonged time between consultation and interpretation of results. Since many of these same infants also have cardiorespiratory (CR) events, we sought to identify a characteristic pattern on the oxipneumogram (OxiPn) that would identify the presence of GER. In our institution, we have identified such a characteristic pattern on the OxiPn and hypothesize that there is a strong association between prolonged apneas with desaturations and GER identified on the MII-pH study.

Objective: To determine the reliability of OxiPn in the identification of GER in patients with CR events.

Methods: Retrospective chart review of all infants referred to the Infant Apnea Program who had an OxiPn study with subsequent MII-pH study from 2014 to 2017. The OxiPn was evaluated by an Apnea Team not blinded to the clinical history or examination. The MII-pH study was evaluated by Pediatric Gastroenterology. An OxiPn with prolonged apnea (>20 seconds) and desaturations was considered suggestive of GER. We estimated that 54 patients were needed to detect a specificity of 85% with alpha error < 0.05 with a 60% prevalence of GERD.

Results: Forty-eight patient charts were reviewed: mean birth weight was 1660 (±1061) grams and mean GA 30.5weeks (±5 days). There was a mean of 9 days between the two studies. Thirty-two infants were positive for GER on both the OxiPn and MII-pH study. Three infants were negative in both studies with a sensitivity of 94% (indicating a good probability that a neonate with GER and CR events will be identified by OxiPn. Specificity was 21%, and there was a negative predictive value of 60% and a positive predictive value of 74%.

Conclusion: There is close association between GER on the MII-pH study and OxiPn with prolonged apnea/desaturations. A prospective study with concordant studies may help to determine whether the OxiPn is sufficient alone to diagnose GERD in symptomatic babies.

ABSTRACT 6.

IMPROVEMENT IN I-PASS HANDOFF COMPLIANCE ON THE PEDIATRIC UNIT

Alex Choi MD, Tasmia Rezwan MD, and Ilana Harwayne-Gidansky MD
Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY

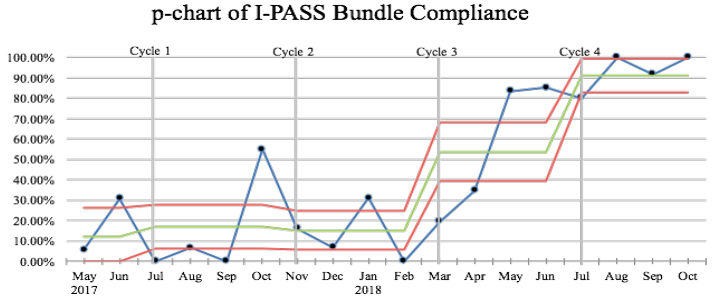
Background: The importance of handoff is gaining more emphasis in clinical medicine. The I-PASS handoff is one of the leading tools developed for this purpose and has been shown in multiple studies to significantly reduce medical errors. Since its introduction to the Stony Brook Children's Hospital (SBCH) general pediatrics unit in 2015, there have been multiple efforts to improve compliance of I-PASS through an iterative quality improvement process.

Objective: To increase the bundle compliance of I-PASS handoff components to 50% between July 2017 and June 2019.

Methods: Pre-intervention data were collected from May 2017. Data were grouped by month, and three months were designated as one PDSA cycle. Handoff sessions on the SBCH general pediatrics floor were directly observed using a customized observation tool, which includes I-PASS components, whether the floor team was primary service, and common I-PASS deviations. A total of six interventions were performed: workshop (three separate sessions), lecture, grand rounds lecture, and senior synthesis feedback tool. Microsoft Excel and SPSS were used for statistical analyses.

Results: Prior to intervention, I-PASS bundle compliance was 18.16%. After PDSA Cycles 1 and 2 (I-PASS workshop and lecture), bundle compliance was 15.3% and 13.4%. From PDSA Cycle 3 (Senior Synthesis feedback tool), bundle compliance increased to 55.6% and 92.9%. In terms of I-PASS deviations, Excessive Summary showed the highest frequency during pre-intervention. During the remaining PDSA Cycles, Interruptions were the most frequent I-PASS deviations. Out of the total 40 Interruptions, only two were deemed emergent. ANOVA analysis showed significant difference within groups ($p<0.001$), with post-hoc analysis showing no difference between Cycle 1 and 2, but significant difference with PDSA Cycle 3 and Cycle 4.

Conclusion: We demonstrated a significant increase in bundle compliance of I-PASS. The most significant increase was from the Senior Synthesis feedback tool (PDSA Cycle 3). Non-emergent interruptions were the most frequent I-PASS deviation. The next phase will include interventions to maintain bundle compliance and decrease I-PASS deviations.



ABSTRACT 7.

USE OF AN INDIVIDUALIZED TEACHING PLAN TO AUGMENT TEACHING SKILLS FOR PEDIATRIC RESIDENTS

Mina Ekladios, MD, MS[1]; Robyn Blair, MD[1]; Rachel Boykan, MD[1]; Catherine Messina, PhD[2]; Maribeth Chitkara, MD[1]

Depts of Pediatrics[1], and Family, Population and Preventive Medicine[2], Stony Brook Medical Center

Background: The Stony Brook Pediatric Residency Program offers a teaching retreat for new trainees (interns, residents, fellows) to discuss the value of a positive learning environment, skill-building teaching techniques, and delivery of verbal and written feedback.

Objectives:

1. To implement and track an Individualized Teaching Plan (iTeach) as part of the annual "Residents as Teachers" workshop for incoming pediatric trainees
2. Evaluate the longitudinal impact of iTeach plans on resident teaching skills

Methods/Design: Pediatric trainees at an annual Residents as Teachers (RAT) Retreat were eligible for inclusion. Trainees at the RAT (T1) completed iTeach surveys to reflect on personal strengths and weaknesses and identify teaching techniques for daily implementation. Follow-up iTeach surveys were completed at one- (T2) and six-month (T3) intervals. Participants rated nine teaching characteristics on a 3-item scale from "strength" to "needs improvement" and identified three teaching techniques to implement. Medical students in the pediatrics clerkship completed a validated tool (Intern Clinical Teaching Effectiveness Instrument; ICTEI) to evaluate trainees' teaching pre- and post-RAT.

Results: Fifteen trainees completed iTeach surveys at T1. Fourteen and seventeen trainees completed follow up iTeach surveys at T2 and T3. Common strengths (T1-T3) included working well with others (T1=80%, T2=93%, T3=88%); ability to recognize limitations (67%, 79%, 69%); communications skills (60%, 64%, 71%). Characteristics needing improvement were confidence (33%, 7%, 24%); medical knowledge (27%, 14%, 53%); time management (20%, 14%, 18%). Most likely-to-be-used teaching strategies were "feedforward", "what-if" scenarios, and clinical reasoning exercises. Qualitative analysis of T2/T3 responses revealed increased confidence in implementing teaching techniques and use of feedback with students over time. Comments also reflected personal knowledge gains in differential diagnosis formation and complex thinking. ICTEIs collected before (N=24) and after the RAT (N=10) demonstrated trainees always/very often created a good learning environment and taught effective patient/family communication skills.

Conclusion: iTeach plans were successfully integrated into the RAT and residency training program, but further research will inform whether the iTeach improves resident retention or usage of newly acquired teaching skills. Additionally, residents reported personal knowledge gains through implementing these techniques. While response rates were low, students' ratings reflected overall improvement in residents' coaching and teaching ability after the RAT. With continued implementation, next steps will include further analysis to define teaching techniques best suited for trainee utilization.

ABSTRACT 8.

COMPARING SICKLE CELL DISEASE ACUTE PAIN MANAGEMENT IN THE PEDIATRIC AND ADULT EMERGENCY DEPARTMENTS

Faheem Farooq, MD, MPH[1], Harold Bien, MD, PhD[2], and Devina Prakash, MD[1].

[1]Department of Pediatrics; [2]Department of Medicine

Background: Vasoocclusive pain leading to frequent emergency department (ED) visits and hospital admissions is the hallmark of sickle cell disease (SCD). Adolescents with SCD are known to have higher rates of ED visits, and transitions to adult care are associated with significant challenges. Adults with SCD have reported higher rates of stigmatization and perception of neglect when receiving adult care.

Objectives: Assess if there is a difference in the number of visits, admission rate, analgesia choice, and time to analgesia between pediatric and adult ED visits for patients aged 10-30. Pain management was evaluated based on 2014 National, Heart, Lung, and Blood Institute guidelines.

Method/Design: Retrospective chart review of emergency department visits of 10-30-year-old patients with the diagnosis of sickle cell disease between Jan 2015 to Jun 2018 at one institution. Visits for vasoocclusive pain were selected based on encounter location, chief complaint, and chart review audit. Differences between the pediatric and adult ED were compared via t-test.

Results: There were 43 pediatric ED visits by 21 unique patients resulting in 21 inpatient admissions. There were 177 adult ED visits by 67 unique patients resulting in 77 inpatient admissions. From the 27 pediatric ED encounters that utilized opiates, 52% (14) received opiates within 60 minutes of arrival. From the 148 adult ED encounters that utilized opiates, 47% (70) received opiates within 60 minutes of arrival. Median time to opiate analgesia was 70 minutes in the adult ED versus 56 minutes in the pediatric ED. Thirty-three percent of pediatric ED encounters used non-opiate therapy an hour prior to opiate therapy, compared to only 16% of adult ED encounters.

Conclusion: Despite shorter median time to opiate analgesia, pediatric ED encounters were significantly more likely to utilize non-opiate analgesia prior to opiate analgesia. However, approximately half of patients in both EDs did not receive analgesia within the 60 minutes recommended by guidelines. While there is some practice variation, this study does not demonstrate significant difference in time to analgesia between adult and pediatric ED visits as compared to other studies.

ABSTRACT 9.

CHAGAS DISEASE: A LUCKY INCIDENTAL FINDING?

Edgar Flores MD, Christy Beneri DO, and Saul Hymes MD

Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY

Background: Chagas disease is one of the most common vector borne parasitic diseases in the Americas. It is caused by *Trypanosoma cruzi* and is usually spread through the bite of blood-feeding Triatominae insects, although disease may also be spread by blood transfusion or organ transplantation from an infected donor. The natural history is one of a lengthy asymptomatic (indeterminate) phase of illness which may last decades before symptoms appear. These symptoms are irreversible and commonly include fatal cardiomyopathy and megacolon. Treatment is available but must be given before chronic symptoms occur. Thus, identifying infected but asymptomatic Chagas patients is of prime importance: here in the US alone it is estimated there are up to 300,000 undiagnosed infected immigrants. In 2007, the US began testing the blood supply for Chagas disease. We report here a case of an immigrant adolescent identified with Chagas Disease through blood supply screening.

Case Report: The patient is a 16-year-old young man born in El Salvador, where he lived until emigrating to the US at age 7. After a school blood drive, he was notified by New York State that his blood was positive for antibodies for *Trypansoma cruzi*. He was referred to pediatric ID clinic where he was retested twice and Chagas disease was confirmed. As he had no symptoms, he was suspected to be in the indeterminate state of disease. Evaluation by gastroenterology and cardiology, including EKG, ECG, and cardiac MRI, were entirely normal. The patient completed a 2-month course of Benznidazole. He remains asymptomatic.

Conclusion: Chagas disease is a treatable illness, but only if diagnosed relatively early. The majority of individuals with Chagas disease are immigrants from Latin America. The case here is an example of how such individuals, through routine blood supply screening, can be identified and treated. Since testing began, it is estimated that 1 in 27,500 donors tests positive for Chagas disease. However, the true prevalence, especially locally in our community is not known, although Suffolk County's population is 17% Hispanic. Thus screening programs, such as blood donor testing or perhaps larger targeted screening of Latino immigrants, may prove fruitful. A prevalence study on Chagas disease is ongoing at our institution.

ABSTRACT 10.

IDENTIFYING HIGH RISK FACTORS FOR INITIAL TREATMENT FAILURE IN KAWASAKI DISEASE

Katherine Glover DO, Kathleen Walsh MD, Julie Cherian MD and Christy Beneri DO

Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY

Background: Kawasaki disease (KD) is one of the most common vasculitides of childhood. Early diagnosis and treatment is critical to prevent serious complications, most notably coronary artery aneurysms. Initial treatment is intravenous immunoglobulin (IVIG) and high-dose aspirin therapy. An estimated 10-20% of patients fail initial treatment and require subsequent therapies. Several studies have identified high risk patient criteria for initial treatment failure in Japan but have shown poor-applicability to patients in the United States. This study will formally analyze high risk features described in a KD protocol at our institution.

Objective: We sought to elucidate clinical features of patients diagnosed with KD who failed initial treatment so these patients may be risk-stratified at diagnosis. We hypothesize that patients of male gender, age <1 year, Hispanic ethnicity, with serum CRP >100 mg/dL and/or platelet count <100,000 per microliter will be at increased risk for initial IVIG treatment failure.

Methods: Retrospective chart review of patients from 2010 - 2017 with the diagnosis of KD was completed. A logistic regression model assessed if complete or incomplete KD, sex, ethnicity, and CRP elevation were predictors of treatment failure. T-test was used to evaluate specific lab values. Echocardiogram data were also obtained.

Results: Seventy patients were treated for KD with 29% (20/70) failing initial treatment and requiring subsequent therapies. No significant differences were found between the failed and response treatment groups with regard to ethnicity, age, CRP measurement or platelet count (all $p > 0.05$). However, there was a trend suggesting that males may be more likely to experience initial treatment failure ($p=0.124$). AST and ALT were significantly more elevated in those who had treatment failure ($p=0.002$ and $p=0.025$, respectively). Positive echocardiogram findings were noted in 24% (17/70) of patients, with 53% (9/17) receiving additional treatment after initial IVIG.

Discussion: Our data did not suggest that our identified risk factors helped predict treatment failure. Although there was no statistically significant difference between genders, our data does suggest a trend that males are more likely to fail initial treatment, as shown in another US based study. Liver enzymes were significantly more elevated in our treatment failure group and could play role in risk stratification of these patients. Initial echocardiogram findings were not useful to predict treatment failure. Reassessment of our risk stratification is needed.

ABSTRACT 11.

THE ASTHMA JOURNEY GAME: IMPROVING INTRA-TEAM COMMUNICATION FOR PATIENT CENTERED ASTHMA EDUCATION

Diana Kaplan DO, Candice Foy MD, and Kathrine Kevill MD

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Background: There are at least 200 pediatric admissions to Stony Brook Children's Hospital (SBCH) for asthma per year. High quality education helps to decrease readmissions for asthma. Despite ongoing initiatives at SBCH, a 2017 chart review identified large gaps in the documentation of patient asthma education.

Objective: To determine the feasibility of implementing a multi-disciplinary, interactive sticker check list, called the Asthma Journey Game (AJG). We defined feasibility as a 75% distribution, completion, and return rate.

Methods/Design: This was a feasibility study. A pre-intervention needs assessment was sent to participating stakeholders (residents, nurses, respiratory therapists, and hospitalists). Patients admitted to 11N under the asthma protocol were eligible for the AJG. The AJG has four colored circles, each representing a component of asthma education (asthma class, inhalation devices, triggers, and asthma action plan). When a piece of education was provided, the stakeholder placed a colored sticker onto the corresponding circle. Each AJG was numbered and collected for tracking purposes. This process was explained to stakeholders via e-mail, flyers, and teaching sessions. Descriptive statistics were used for analysis. A follow-up survey was sent out to assess the perceived impact of the intervention.

Results: The pre-intervention survey revealed that 74% of respondents felt communication about asthma education was very important, and 64% agreed that it is confusing for a family to receive education from multiple health care providers. From July 2018 – February 2019, there were 74 asthma admissions on 11N. The AJG was distributed to 80% of patients (n = 59), and 75% of those forms were returned (n = 44). Twenty-nine percent of the forms were fully completed, and 71% were partially completed. The post-intervention survey revealed that 77% of respondents thought the AJG served as useful tool, and 60% agreed that it did not interrupt workflow.

Conclusion: We demonstrated feasibility in distributing and collecting the AJG. However, the majority of forms were partially completed, indicating that team members may have forgotten their role, did not know their role, or a piece of asthma education was not provided. The majority of stakeholders found the tool to be useful, suggesting that the AJG or a similar electronic concept may improve communication. Future studies may focus on family satisfaction with having a visual aid in their room that demonstrates multi-disciplinary communication.

ABSTRACT 12.

CHANGES IN BMI OCCURING WITH HORMAL TRANSITION IN TRANSGENDER YOUTH

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Background: Pediatric obesity and transgenderism are two highly prevalent public health topics. Seven hundred thousand American adults identify as transgender. Such individuals face social pressure, mental illness, financial costs, and medication side effects. With expanding transgenderism support, this open population has grown to include adolescents. Unfortunately, research on transgender youth is limited. Pediatric obesity, on the other hand, encompassing about 18.5% of children, is proven to correlate with medical and psychiatric dysfunction. Providers must be aware of the connection between abnormal BMI and transgender youth, given the higher prevalence of both depression and eating disorders in this population.

Objective: Investigate BMI prior to medical transition and trends throughout in transgender adolescents.

Methods/Design: A retrospective chart review was conducted on gender-dysphoric individuals ages 9-20 years followed in our institution's pediatric endocrinology clinic. Subjects were categorized into trans-male and trans-female. BMI category and number at medical transition initiation and at 3-month intervals thereafter were collected. Medical transition was defined as pubertal suppression, androgen blockage, and/or cross hormonal replacement. Secondary data included comorbidities and medications.

Results: Of all 76 subjects (51 trans-male, 25 trans-female), 52.6% had healthy BMIs at transition start (28.9% obese, 15.8% overweight, and 2.6% underweight). Also prior to start, a 58.8% majority of trans-males had healthy BMIs (27.5% obese, 11.8% overweight, 2% underweight). Trans-females had a lesser majority with 40% healthy, 32% obese, 24% overweight, and 4% underweight. For the entire sample, no statistically significant BMI change was observed throughout overall transition. However, when evaluated in 3-month intervals, a significant BMI increase was found from transition start to 7-12 months, and from 3-6 to 7-12 months. When stratified into groups, trans-males demonstrated a significant BMI increase from start to 3-6 and 7-12 months out. For trans-females, a significant increase was found between the 3-6 month and 7-12 month intervals. No significant decrease in BMI was observed.

Conclusion: The study was limited due to small sample size, profoundly prevalent comorbidities possibly affecting BMI, and data decline with transition lasting over 12 months. Despite this, data revealed no significant BMI fluctuation when undergoing long term therapy. However, patients may experience BMI increases over short-term intervals within hormonal transition. Providers must be knowledgeable of this possibility given that transgender youth are at a higher risk for mental illness including disordered eating.

ABSTRACT 13.

TAKING PATIENT SAFETY FURTHER USING IN-SITU PEDIATRIC SIMULATION

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Background: In-situ pediatric simulations have been used to promote educational objectives including medical decision making, skills mastery, and team building among medical trainees and staff. However, in-situ simulation also has been used to improve patient safety through identification of latent patient safety threats (LSTs). Quality improvement interventions can then be made on such identified LSTs.

Patient safety event reporting systems (SERS) are used in many institutions to gather and report patient safety data. Our institution uses "SB Safe" (RL Solutions©, Toronto, Canada) to provide employees an anonymous and efficient portal to enter patient safety issues observed within clinical practice. Portals are sorted into various patient care categories for easy classification for reporters. All reported data are subject to review and intervention by institutional quality officers.

Objective: This was a prospective observational simulation-based study aimed to evaluate LSTs identified via simulation and resulting quality improvements taken.

Methods/Design: In 2016, the Stony Brook Children's Hospital Pediatric Simulation Program enhanced SB Safe with the addition of a "Simulation" category. This category allowed for recording and cataloging LSTs uncovered during in-situ pediatric simulations. Such LSTs utilize the same data entry fields as actual safety events in SB Safe; however, the data are separated from actual patient events for quality assurance review. Through this process, shared causes for LSTs were identified and methods were placed to prevent recurrence of adverse safety events. This study analyzed the LST data the Simulation portal gathered and investigated interventions taken thereafter. Inter-professional in-situ simulations ran approximately twice-monthly.

Results: Since implementation of the Simulation portal, 29 LSTs have been uncovered and reviewed. The most prevalent contributing factors (accounting for 50%) were education/training, human factors, and equipment/supplies. LSTs were also reviewed using the Healthcare Performance Improvement Safety Event Classification severity algorithm to determine which of these had the highest potentially associated harm. Approximately 2/3 of the time, these events reached the simulated patient. Furthermore, the Pediatric Simulation and Quality Patient Safety teams at Stony Brook Children's Hospital have intervened on 7 of these 29 safety threats to date.

Conclusion: Our institution created a process to uncover, review, and act upon LSTs using pediatric in-situ simulation. This process may help to decrease potential threats to actual patients. Further investigation is warranted to see if these interventions correspond to improved patient outcomes.

ABSTRACT 14.

VARIABILITY IN PRE-PARTICIPATION PHYSICAL EVALUATION (PPE) CARDIOVASCULAR SCREENING OF HIGH SCHOOL ATHLETES ON LONG ISLAND- ASSESSING THE IMPACT OF 2014 AHA/ACC GUIDELINES UPDATE

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Background: Sudden cardiac death (SCD) is a rare, devastating event (0.5-1/100,000 person-years). In the US, PPE is used to screen athletes for cardiovascular risk factors associated with SCD. In 2014, AHA guidelines for SCD screening were updated from their 2007 12-point guidelines to include two additional personal history elements. No federal or state laws mandating the implementation of a universal, comprehensive PPE form exist, resulting in poor compliance with guideline recommendations.

Objectives: To evaluate compliance of 127 high school PPE forms with the 14 element PPE cardiovascular screening guidelines endorsed by the AHA/ACC in 2014. To determine if compliance has changed from 2014 to 2018 given these updated guidelines.

Methods: PPE forms for all public and private high schools (127 forms) in Suffolk and Nassau Counties, NY, were collected between August and November 2018 and compared to the 14-element PPE endorsed by 2014 AHA/ACC guidelines. Results were compared to data previously collected between January and April 2014 which evaluated compliance of the12-point AHA 2007 guidelines. PPE form compliance was evaluated over these two time-points to assess the impact of 2014 AHA/ACC recommendations. Frequency distributions were examined to determine proportions of AHA guidelines elements included. Sums of elements included were compared for 2014 and 2018 using paired sample t-tests. Proportions of elements were compared over two time points using the McNemar test for repeated measures. All tests of significance were two-tailed. Statistical significance defined at $p<0.05$.

Results: 2018 data: Only 2.4% of the PPE forms included all recommended 14 elements. Seventy-nine percent of PPEs included ≤50% of the recommended elements. Twenty percent included the two new elements from the updated 2014 AHA/ACC guidelines. Results were independent of County and private vs public.

2014 vs. 2018 PPE Form Compliance by Category

AHA PPE categories	2014 mean (SD)	2018 mean (SD)	P-values
Personal history (5)	2.6 (±1.9)	2.6 (±1.7)	0.88
Family history (3)	0.6 (±1.0)	0.6 (±0.98)	0.88
Physical exam (4)	2.0 (±0.4)	0.9 (±0.70)	0.001

Conclusions: Compliance with the 14 element PPE cardiovascular screening endorsed by the AHA/ACC is poor among all Nassau and Suffolk County high schools. Compliance has not improved despite an update in guideline recommendations for SCD screening published in 2014.

ABSTRACT 15.

EARLY INTRODUCTION OF ANAPHYLAXIS INTO MEDICAL SCHOOL CURRICULUM

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Background: Despite increasing prevalence rates, anaphylaxis is underdiagnosed and undertreated by physicians, suggesting a gap in medical education.

Objective: We hypothesized that the early introduction of anaphylaxis education into the medical school curriculum would improve students' knowledge of anaphylaxis diagnosis and management.

Methods: Third year medical students were studied prospectively during their pediatric clerkship at a children's hospital. Students were randomly assigned to group A (didactic lecture plus simulation laboratory) or group B (didactic lecture only). First, students were expected to complete a demographic questionnaire and pretest to assess baseline knowledge of anaphylaxis (10 item quiz, scored 0-10 points). Second, students received a lecture on anaphylaxis including hands-on demonstration of epinephrine autoinjectors, followed by a 10 item post-test. Group A then participated in a scripted anaphylaxis scenario reviewing anaphylaxis diagnosis, and management using high fidelity mannequins in the Simulation Laboratory. All subjects completed a long-term follow-up test and satisfaction questionnaire 8-12 weeks later.

Results: A total of 87 students completed the study. Mean test scores improved significantly for both groups from pretest (Group A: 5.93 ± 1.70, Group B 5.86 ± 1.44) to post-test (Group A 9.16 ± 1.00, Group B 9.24 ± 0.98), $p < .01$. However, long-term follow-up scores did not differ between Groups A (7.00 ± 1.57) and B (6.93 ± 1.76), $p = 0.85$. Most students reported a positive learning experience (97.8% of Group A and 76.2% of Group B).

Conclusions: Although students strongly support simulation training for anaphylaxis education, the addition of a simulation module to didactic lecture does not improve long-term retention of anaphylaxis knowledge. Future studies should focus on other educational modalities that will enhance medical student knowledge of this potentially fatal condition.

	Mean Pretest Score +/- SD	Mean Immediate Post-test Score +/- SD	Long-term Post-test Score +/- SD
Group A	5.93 ± 1.70	9.16 ± 1.00	7.00 ± 1.604
Group B	5.86 ± 1.44	9.24 ± 0.98	6.71 ± 1.697

- P value comparing pre- and post-test scores between group A and B is <0.01 (statistically significant)
- P value between long-term test score between group A and B is 0.85 (not significant)

ABSTRACT 16.

HOW TO PUT AN "I" IN TEAM: INTEGRATING IPADS INTO TEAM BASED LEARNING DURING THE PEDIATRIC CLERKSHIP

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Background: Undergraduate medical education increasingly embraces the use of technology to deliver material and promote self-directed learning. Team-based learning (TBL) uses the "flipped classroom" approach for student-centered active learning and has traditionally been presented in paper format. We integrated multimedia into the TBL cases in the Pediatric Clerkship using the Examsoft e-learning platform on iPads to enhance clinical teaching by incorporating interactive graphics into the readiness assurance process (RAP).

Objective: The purpose of this project was to examine the effectiveness of utilizing technology during the TBL sessions (eTBL) compared to the use of traditional TBL paper cases on student performance and satisfaction.

Methods: All students on their Pediatric Clerkship were enrolled in the study during the 2018-2019 academic year (n=72). During each 6-week block, 3 TBLs were conducted using the eTBL format, and 3 were done traditionally, using paper handouts and lottery scratch cards. Topics covered in the TBLs include: Nutrition, Anemia, Asthma, Abdominal Pain, Fever and Toxicology. Independent samples t-tests were used to compare student performance on the RAP between eTBL and paper TBL groups. Students completed a post-session satisfaction questionnaire that included 5-point Likert scale items and 4 open-ended questions.

Results: Percentage scores on the RAPs were slightly higher for the eTBL group compared to the paper TBL group except for the Asthma and Fever modules, but only the Abdominal Pain ($M = 90.2$ vs. 84, $p=0.04$) and Toxicology TBLs ($M = 85.6$ vs. 79.4, $p=0.03$) were statistically significant. Students reported mixed feedback regarding the eTBLs. In general, students appreciated the additional visuals that the eTBLs had and cited environmental friendliness as a strength. Students did feel that the eTBL format detracted from team discussions, was difficult to navigate and the lack of ability to take notes was unsatisfactory.

Conclusion: Integrating technology into TBLs is a feasible addition to the clinical curriculum although many students preferred paper. Multimedia formats can allow for novel delivery of clinical scenarios allowing more realistic application of clinical knowledge. Optimizing mode of delivery and improving integration of media such as adding audio and video files into cases will allow for a more comprehensive experience. Future research will evaluate NBME subject exam results for potential differences in performance between groups that utilized the eTBL as compared to the paper TBL.

ABSTRACT 17.

CHARACTERISTICS OF ATTRITION FROM A PROTOCOL-BASED ENRICHED MEDICAL HOME INTERVENTION (EMHI)

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Background: The Keeping Families Healthy (KFH) program is a nationally recognized award-winning protocol-based EMHI that aims to help families achieve self-sufficiency in adhering to recommended clinical care. Participation in the program has proven positive impact on improving vaccination rates and reducing preventable emergency room visits. Attrition from clinical interventions targeting underserved populations, especially those that include home visitation, is a substantive challenge to achieving optimal health outcomes.

Objective: Identify predictors of attrition from a protocol-based EMHI that utilizes community health worker home visitation and is proven to improve adherence to recommended clinical care so that this information can be used to target future outreach.

Methods/Design: We performed a secondary data analysis of 304 families participating in KFH. Completers (N=190) finished the program with mutual agreement that the family can independently adhere to recommended clinical care. Non-completers (N=114) were lost to follow-up or dropped out before reaching this milestone. The participants were primarily caregivers of < 24-month-olds (N=180, 59.2%), insured by Medicaid (N=210, 69.1%) and Spanish/Hispanic/Latino (N = 168, 55.3%).

Results: In univariate testing, specific primary caregiver's characteristics (i.e. primary spoken language, risk of depression, trust in neighbors, and current living situation) and EMHI program factors (i.e. referral source, program module, referral reason "difficulty navigating the healthcare system", self-selected program goals of "newborn care" and "overcoming barriers/health literacy") were significantly associated with attrition ($p < 0.05$ for each predictor). Significant factors based on the univariate tests were further considered in a multivariable logistic regression model, adjusting for the interaction between caregiver's primary spoken language and KFH goal "overcoming barriers/health literacy" because these two variables were highly correlated. Selection of the "newborn care" program goal and primary caregiver's spoken language of "Spanish" (among patients with KFH goal as overcoming barriers/health literacy) were associated with less likelihood of attrition (OR 0.35, 95% CI 0.16-0.78 for selecting newborn care, OR 0.29, 95% CI 0.12-0.72 for interaction term) and inability to trust people in the neighborhood was associated with greater likelihood of attrition (OR 2.45, 95%CI 1.05-5.69).

Future Directions: With this information, we plan to target families requiring extra support to achieve program completion and assist them in achieving health care navigation independence. With further investigation, our findings may be useful in outreach efforts for other clinical interventions using home visitation.

ABSTRACT 18.

NUTRITIONAL CHALLENGES AND POSTNATAL GROWTH RESTRICTION IN INFANTS WITH NECROTIZING ENTEROCOLITIS (NEC)

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Background: Necrotizing enterocolitis (NEC) is a major cause of morbidity and mortality among preterm infants. The nutritional status of infants with NEC may be compromised due to gut inflammation associated with NEC as well as the required discontinuation of enteral feeding and administration of total parenteral nutritional (TPN). However, data regarding growth and nutrition losses among infants with NEC are limited.

Objective: To quantify and compare energy and protein intake and growth in preterm infants who developed NEC and those who did not.

Design/Methods: Retrospective case-control study of infants < 34 wks admitted to Stony Brook NICU from January 2013 through December 2018. For each NEC case, controls were matched based on gestational age and birth weight from each birth year. Daily intake of kcal, protein, calcium, and micronutrients were recorded for each day of NEC course and equal day of life for controls. Weight, length, and head circumference Z-scores were calculated at birth and discharge. Mean Growth velocities were reported using the Fenton Growth Chart.

Results: Twenty-seven NEC cases and 54 controls were included in the study. Mean gestational age (28.4 vs 28.5wks) and birth weight (1055gms vs 1063 gms) were similar. The change in Z- score for weight ($p<0.4$) showed a downward trend in NEC babies. Changes in Z-scores length and head circumference (table1) were not significant between NEC and controls. The protein intake in NEC babies pre-, during and post- NEC range from 3.4, 3.24, and 3.55 gm/kg, respectively. Their caloric intakes were 85, 83, and 113 kcal/kg/day respectively. Mean growth velocities between NEC and controls were statistically significant change between length (p 0.03) and head circumference (p 0.01). Data on micronutrients and macronutrient intake in controls is in progress.

Conclusions: The majority of infants in our cohort with or without NEC experienced growth failures, which were more significant in NEC cases. Growth velocities were affected in all parameters. Optimizing nutrition intake during NEC and Post NEC with a prospective randomized control trial might help determine whether growth failure due to NEC can be explained by decreased energy and protein intake.

Growth Parameters	NEC(N=27) Z score-with P value	Controls (54) Zscore with Pvalue
Change in Birth to Discharge Weight Z score	-2.076(0.04)*	-1.03(0.3)
Change in Birth to Discharge Length Z score	-1.41(0.15)	0.91(0.36)
Change in Birth to Discharge Head Circ Z score	0.67(0.5)	-0.04(0.6)

Growth Velocity	NEC-N(27) +_SD	Controls N=54(+-SD)	P Value(Confidence intervals)
Weight (kg/yr)	6.19(+_-3.2)	7.57(+_3.2)	P=0.06(-0.09-2.9)
Length (cms/yr)	38(+-18)	50.09(=+-26.7)	P=0.03*(0.74-23.04)
Head Circumference (Cms/mon)	2.94(+-1.06)	3.35(+-0.95)	P=0.01*(0.12-0.69)

*P<0.05 statistically significant

ABSTRACT 19.

RESIDENT ADHERENCE TO I-PASS WRITTEN HANDOFFS IMPROVES FOLLOWING ONE-ON-ONE STRUCTURED FEEDBACK SESSIONS ON-UNIT.

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Background: The I-PASS handoff method reduces medical error and adverse events during transitions in care. Although introduced to the Stony Brook Pediatric Residency program in 2015, physician knowledge and application of I-PASS handoff remain variable, with low adherence to this method. We sought to improve compliance to the I-PASS method in written handoffs by implementing individualized feedback to residents.

Hypothesis: Providing one-on-one structured feedback to PGY1 residents in the general pediatrics inpatient unit will significantly improve adherence to the written I-PASS method.

Methods: Written handoff documents were assessed for adherence to I-PASS criteria (i.e. inclusion of requisite and omission of inappropriate components) for PGY-1 residents on general pediatric inpatient service. Following 2 handoff sessions, an I-PASS-trained PGY-2 resident conducted a one-on-one in-situ feedback session with each PGY-1 resident. Additional handoff sessions were subsequently assessed for each PGY-1 resident during the same block. To assess inclusion of appropriate elements, Patient Summaries, Action Lists and Situational Awareness components were scored by the observing resident for each PGY-1 resident. Action Lists were additionally graded for appropriate omission of tasks not assigned to the next shift. All four scores contributed to calculation of a raw percentage score with comparisons across categories performed before and after the feedback session intervention.

Results: Written patient handoffs (n=116) were scored before (n=43) and after (n=73) the feedback session. Raw Scores improved significantly ($p<0.001$) from pre-intervention (65% ± 22%) to post-intervention (81% ± 19%). Patient Summary Quality scores also improved from pre- (3.0 ± 0.9) to post-intervention (3.9 ± 1.0), $p<0.001$. Inclusion of Situational Awareness likewise improved (61% pre, 88% post, $p=0.01$). However, inclusion of Action List items (73% pre, 87% post, $p=0.13$) and appropriate omission of Action List items not assigned to the next shift (58% pre, 60% post, $p=0.82$) remained unchanged.

Conclusions: Performance of a single structured feedback session enhances overall quality of written I-PASS handoffs. Specifically, quality of the Patient Summaries and inclusion of Situational Awareness improve significantly. Future studies will involve this valuable communication tool in additional educational modalities as a means to enhance overall resident competency.

Adherence to I-PASS Components Before and After Feedback Sessions					
	Pre-Session		Post-Session		p-value
	n	Score	n	Score	
Total Raw Score	43	65% ± 22%	73	81% ± 19%	p<0.001*
Pt. Summary Quality (score 0-5)	43	3.0 ± 0.9	73	3.9 ± 1.0	p<0.001*
Includes S/A as Needed	23	61%	50	88%	p=0.01*
Includes Actions as Needed	30	73%	53	87%	p=0.13
Omits Actions Appropriately	43	58%	73	60%	p=0.82

ABSTRACT 20.

UTILITY OF AN OUTCOME ESTIMATOR TO PREDICT SEVERE BRONCHOPULMONARY DYSPLASIA IN PREMATURE NEONATES

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Background: Bronchopulmonary Dysplasia (BPD) remains a common pulmonary morbidity despite advances in neonatal respiratory management. The ability to predict BPD severity early in life is essential to developing long-term management strategies to optimize care in this population.

Objective: To assess the usefulness of the Neonatal BPD Outcome Estimator in predicting severe BPD in the very low birth weight (VLBW) population in an academic tertiary care regional perinatal center.

Methods: This is a single-center retrospective study including VLBW infants born 23-30 weeks' gestation and <1250 grams at Stony Brook Children's Hospital NICU from 2015-2018. Severe BPD was defined as those receiving O_2 for ≥ 28 days plus ≥ 30% O_2 or positive pressure at 36 weeks post menstrual age (PMA). The Neonatal BPD Outcome Estimator was used retrospectively to assess risk for severe BPD on postnatal day 14, 21, and 28. Probabilities for the outcome of severe BPD were expressed as mean percentages ± standard deviation at each point in time. Sensitivity, specificity, positive predictive values (PPV), and negative predictive values (NPV) were calculated. Receiver operating characteristic curves (ROC) were created to test the accuracy of the BPD Outcome Estimator to predict severe BPD at each postnatal day.

Results: A total of 268 charts of VLBW patients were reviewed and 129 patients met our inclusion criteria with a mean GA 27 ± 2.1weeks and mean BW 892 ± 208g. Thirty-one patients (24%) were diagnosed with severe BPD at 36 weeks PMA. The mean probabilities for severe BPD at 14, 21, and 28 postnatal days were 23 ± 8, 21 ± 9, and 25 ± 8 respectively using the BPD Outcome Estimator. Sensitivity, specificity, PPV, and NPV for predicting severe BPD were similar at all points in time with the following ranges: sensitivity 65-68%, specificity 87-92%, PPV 62-72%, and NPV 89-90%. ROC curves demonstrate increasing accuracy with AUC 0.829, 0.856, and 0.913 at 14, 21, and 28 postnatal days respectively.

Conclusion: The Neonatal BPD Outcome Estimator provides prognostic information that can be useful in identifying infants at high risk for poor outcomes who could benefit from early respiratory interventions. Prospective studies are needed to determine respiratory strategies that will provide the most benefit, least harm, and show the greatest reduction in severity and outcomes.

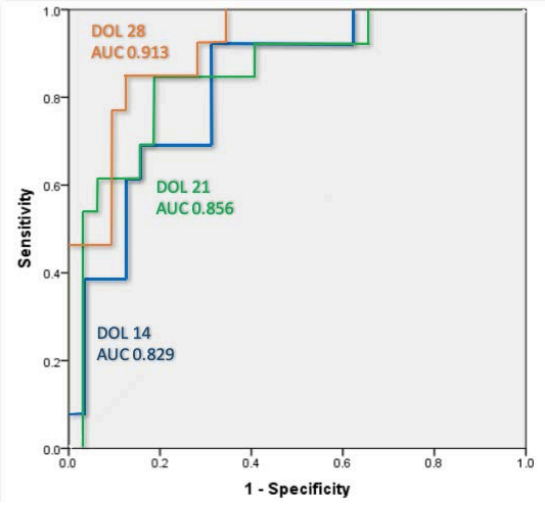

Figure 1. Receiver Operating Characteristic (ROC) Curve for the Neonatal BPD Outcome Estimator 14, 21, and 28 postnatal days**.**

DOL= Day of Life
AUC= Area Under the Curve

ABSTRACT 21.

PREVALENCE AND LONG-TERM OUTCOMES OF NEONATAL HYPERTENSION; SINGLE SUBURBAN CENTER EXPERIENCE

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Background: Reported prevalence of neonatal hypertension (nHTN) varies and long-term outcomes of are not well studied. Some studies show that a majority of newborns treated for nHTN without identifiable cause may eventually discontinue medicine, whereas secondary nHTN requires long-term treatment.

Objective: To describe prevalence and outcomes of nHTN diagnosed in neonates treated in tertiary suburban neonatal intensive care unit (NICU) and followed for up to 2 years after discharge.

Methods/Design: We identified neonates admitted to our NICU and treated for nHTN between 1/1/2012-7/1/2017. Clinical data, including demographics, clinical characteristics, laboratory values, pregnancy, delivery, maternal history and was obtained by chart review. Data were analyzed by descriptive statistics.

Results: Out of 5,538 NICU subjects only 15 (prevalence 0.27%); 11 males, 9 Caucasians, with mean weight 2.2±1.2kg, gestational age 33.4 ± 4.5 weeks of gestation, Apgar 1/5 minutes= 7.3±1/8±0.8, were treated for nHTN. Mother's age was 32.1±4.1 years, body mass index was 28.8±5.7, 1 had preeclampsia, 1 had gestational HTN, 33.3% (5/15) had diabetes (3 gestational), and only 33.3% (5/15) had no medical history. Newborn's median age at nHTN treatment was 20 days (range 1-120). 86.7% (13/15) newborns had an identified cause for nHTN: 33.3% (5/15) had renovascular nHTN, 20% (3/15) had abnormal renal ultrasound, and 33.3% (5/15) had left ventricular hypertrophy (LVH). Outcomes of nHTN are shown in Table 1. At 2 years follow up none of the subjects had chronic kidney disease; their average serum creatinine was 0.3±0.02mg/dl and none had LVH. Two subjects with nHTN died (cause of death was respiratory failure due to severe bronchopulmonary dysplasia and cardiopulmonary arrest), and 6 subjects were lost to follow up.

Conclusion: In our center nHTN that requires treatment is rare and mostly secondary to renovascular causes. Majority of mothers of newborns with nHTN had either diabetes/gestational HTN or preeclampsia. Diuretics and calcium channel blockers are commonly used drugs and majority of subjects have normal blood pressure, normal renal function, no LVH, and are off medications by 2 years of age or younger. Due to its infrequent occurrence, multicenter studies are required for full description of nHTN.

Table 1. Outcomes of 15 subjects treated in NICU for neonatal hypertension

Follow up time	0 mo	<3 mo	3 mo	6 mo	12 mo	24 mo
Subjects followed, n (%)	15 (100)	8 (53.3)	5 (33.3)	6 (40)	6 (40)	5 (33.3)
Subjects treated, n (%)	15 (100)	6 (75)	4 (80)	3 (50)	3 (50)	3 (60)
Medication type	9 D 5 CCB 1 ACE	3 D 3 CCB	2 D 2 CCB	2 D 1 CCB	1 D 1 CCB 1 ACE	1 CCB 2 ACE
BP %ile <95, n (%)	0 (0)	4 (50)	4 (80)	3 (50)	6 (100)	5 (100)

mo-months, D-diuretic, CCB-calcium channel blocker, ACE-angiotensin converting enzyme inhibitor

ABSTRACT 22.

DO FRONTAL LOBE DISCHARGES ON EEG PREDICT COMORBID EPILEPSY IN AUTISTIC CHILDREN?

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Background: If we better understand factors predisposing autistic children to epilepsy, it may be possible to improve care of this vulnerable population. Hashimoto (2001) found that 76% of interictal epileptiform discharges (IEDs) in autistic children originate from the frontal lobe. In contrast, only 17% of IEDs are frontal in controls (Eeg-Olofsson, 1971). Furthermore, Kanemura (2013) demonstrated that frontal IEDs in autistic children significantly associated with later development of epilepsy.

Objective: To determine whether frontal IEDs are associated with development of epilepsy in the population of autistic children followed by Stony Brook Child Neurology.

Methods: This was an IRB-approved retrospective chart review of autistic children who received an EEG from Stony Brook Child Neurology in 2017. Data were collected for age, gender, and EEG features including location of epileptiform discharges. Binary logistic regression was used to compute the odds of epilepsy by IED location.

Results: Autistic children (n= 156; 125 male, 31 female; mean age = 9 yr) who had an EEG were identified. Normal EEGs were present in 102 children (65%) while 54 (35%) contained abnormal IEDs. Autistics with abnormal EEGs were subdivided into diagnosis vs no diagnosis of epilepsy then further analyzed by brain lobe and/or generalized activity.

Autistic patients ***with*** epilepsy plus abnormal EEG experienced IEDs in the frontal (n=15), temporal (16), central (7), parietal (4), and occipital (3) lobes, and in generalized (14) areas. Autistic children with abnormal EEGs but ***no*** epilepsy presented with IEDs in frontal (n=3), temporal (6), central (4), parietal (3), and occipital (4) lobes and in generalized (8) areas. Occurrence of frontal IEDs in this cohort was not predictive of comorbid epilepsy (OR=1.2, p=0.85). Generalized IEDs (OR=5.0, p=0.72), followed by temporal IEDs (OR=4.7, p=0.09), conferred highest odds of epilepsy – although not statistically significant. Occipital IEDs, however, conferred *decreased* odds of epilepsy (OR=0.04, p=0.005).

Conclusion: In this study, generalized IEDs, followed by temporal IEDs, conferred highest odds of epilepsy for children with autism while occipital abnormalities were associated with *decreased* odds of epilepsy. In contradiction to previous studies, we conclude that frontal IEDs may not be a predictor of epilepsy in children with autism.

ABSTRACT 23.

CHRONIC LUNG DISEASE PREVENTION USING AN EXTUBATION CRITERIA TOOL IN THE NEONATAL INTENSIVE CARE UNIT: A QUALITY IMPROVEMENT PROJECT

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Background: The very low birth weight (VLBW) population is at risk for complications of prematurity including chronic lung disease (CLD). CLD is associated with chronic respiratory and cardiovascular morbidity, neurodevelopmental delays, and growth failure. Strategies to reduce duration of time intubated and on a ventilator may help decrease the development of CLD.

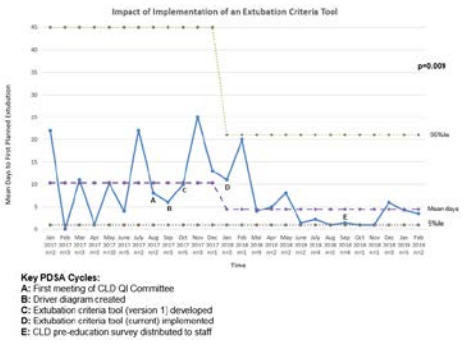
Objective: This quality improvement project aimed to decrease overall rates of CLD in VLBW neonates in the Stony Brook Children's Hospital NICU. Our aim was a 20% reduction in the mean number of days to first planned extubation by developing and implementing an Extubation Criteria Tool.

Methods: Retrospective data were collected from VLBW infants with birthweight <1500 g as a baseline from January 2017 to December 2017. A CLD Prevention Committee was formed and, using sequential Plan-Do-Study-Act cycles, an Extubation Criteria Tool was developed and implemented. Intubated infants were screened daily and, if they met extubation criteria, discussions were held with the primary team to assess clinical status in preparation for a potential extubation. Ongoing prospective data have been collected following implementation of the tool. Data collected includes demographic data, days to first planned extubation, need for reintubation, and CLD diagnosis.

Results: The pre-tool group consists of 45 infants with mean (± SD) GA 28 ± 2.7 wk and BW 1038 ± 248 g. The post-tool group consists of 61 infants with GA 28.6 ± 2.4 wk and BW 1071 ± 283 g. Both groups had similar baseline characteristics (table). There was a trend towards decreased incidence of CLD in the post-tool group (pre 46.7%, post 38.3%; p=0.392). Using the Extubation Criteria Tool, the mean days to first planned extubation decreased from 10.4 days to 4.3 days (p=0.009), which is a 59% reduction (figure). Of those who were extubated, 35% needed to be reintubated within 72 hours due to increasing oxygen requirement, work of breathing, or apnea/bradycardia/desaturation events.

Demographic and Baseline Characteristics (n=106)

	Pre-Tool (n=45)	Post-Tool (n=61)	p-value
Male gender, n (%)	25 (56%)	36 (59%)	0.722
Vaginal delivery, n (%)	15 (33%)	17 (28%)	0.545
Gestational age in weeks, mean (± SD)	28 (± 2.7)	28.6 (± 2.4)	0.636
Birth weight in grams, mean (± SD)	1038 (± 248)	1071 (± 283)	0.177
Apgar 1 min, median (range)	6 (1-8)	6 (1-9)	0.593
Apgar 5 min, median (range)	8 (2-9)	8 (2-10)	0.194
Surfactant administration, n (%)	31 (69%)	36 (59%)	0.298



Conclusion: In VLBW infants, there was a trend towards decreased CLD associated with the use of an extubation criteria tool. Use of formal extubation criteria was significantly associated with earlier extubation. Limitations of the study include a lack of uniform criteria for reintubation and small sample size. Further prospective data is being collected. Future PDSA cycles will include education of the staff and implementation of strategies to optimize non-invasive ventilation.

ABSTRACT 24.

MATURATION OF OXYGENATION RESPONSES IN PREMATURE NEONATES

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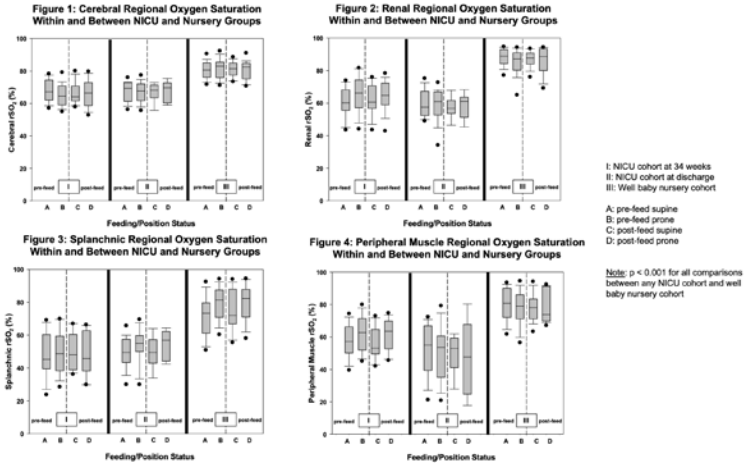
Background: Impaired cerebral oxygenation is a proposed risk factor for Sudden Unexpected Infant Death in premature and full-term neonates. Current hospital discharge-readiness screening does not address the physiologic oxygenation effects of body position changes and enteral feeding in newborns. Near-infrared spectroscopy (NIRS) may aid in demonstrating maturation of tissue oxygenation responses to these routine stressors.

Objective: This study seeks to determine the physiologic maturation of tissue oxygen extraction patterns among preterm infants approaching term-equivalence. We hypothesize that preterm neonates will demonstrate increased cerebral regional oxygen saturation (rSO_2) variability compared to a cohort of full-term neonates and that non-cerebral sites will demonstrate similar responses.

Methods: In this proof of concept, comparative prospective observational study, we collected cerebral, renal, splanchnic, and peripheral muscle rSO_2 data in supine and prone positions before and after two consecutive feeds. The NICU cohort included infants born <30 weeks' GA who underwent data collection once during the 34th week postmenstrual age and again within three days of discharge. Exclusion criteria were ongoing respiratory or IV fluid support, ongoing treatment with anti-reflux medications, or grade III/IV intraventricular hemorrhage. Comparison was made to a well-baby nursery (WBN) cohort of asymptomatic term infants.

Results: The NICU cohort consisted of 13 infants with mean (± SD) GA 28 ± 1.6 wk and BW 1138 ± 260 g. Of these 13 infants, 5 later met exclusion criteria, thus only 8 NICU infants underwent discharge data collection. The WBN cohort consisted of 20 infants with GA 39.2 ± 1.1 wk and BW 3271 ± 552 g. Via within-group ANOVA, body position changes and/or feeding status produced no significant variability in rSO_2 for all organ systems in both the NICU and WBN cohorts (Fig 1-4). NICU subjects always demonstrated lower rSO_2 at all monitoring sites compared to WBN subjects ($p<0.001$ for all comparisons). No rSO_2 maturational effect was observed in the NICU cohort between 34 wks postmenstrual age and term-equivalence.



Conclusion: NIRS can provide information on tissue rSO_2 stability in neonates. Among grouped data, body position changes and/or feeding status did not affect cerebral, renal, splanchnic, or peripheral muscle rSO_2. At 34 wks postmenstrual age and term-equivalence, preterm infants demonstrated significantly lower rSO_2 compared to WBN neonates. Future directions include analysis of rSO_2 patterns within individual infants to determine outliers to this phenomenon.

ABSTRACT 25.

NEUROCOGNITIVE AND BEHAVIORAL FUNCTIONING FOLLOWING INITIATION OF A GLUTEN FREE DIET IN CHILDREN WITH CELIAC DISEASE

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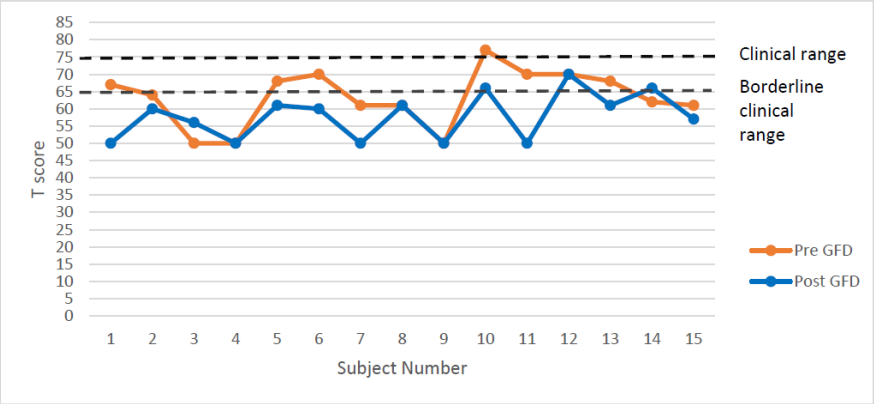
Background: Patients with Celiac Disease (CD) present with various symptoms including, but not limited to, recurrent abdominal pain, diarrhea, vomiting, short stature, and osteoporosis. Additionally, a variety of neurological and behavioral symptoms have been described including headaches, ataxia, hyperactivity and distractibility. However, the evidence for these neurological and behavioral symptoms in children is poor.

Objective: To determine if dietary elimination of gluten in children with CD leads to improved neurocognitive and behavioral functioning.

Methods: This is a prospective study that assesses children's behavior and neurocognition before the initiation of a gluten free diet (GFD) and 6 months later. Patients between 6-18 years old who had both abnormal celiac serology and biopsy proven CD were invited for study enrollment. Three neuropsychological and behavioral assessments were used before and after a GFD:
1) The Kaufman Brief Intelligence Test, Second Edition (KBIT2)
2) The Conners Continuous Performance Test 3rd Edition (CPT3)
3) The Achenbach Child Behavior Checklist for Ages 6-18 (CBCL)
At 6 months their serology was reassessed to follow compliance to the GFD and therapy response.

Results: Fifteen patients completed pre and post testing. Using dependent T-tests for analysis, there was neither significant improvement nor worsening of intellectual assessment on the KBIT2 when comparing scores at diagnosis to scores 6 months after initiation of a GFD. Neither were there significant changes in attentional symptomatology (inattentiveness, impulsivity, sustained attention and vigilance) in the same time frame on the four measures of the CPT3. With CBCL, parent ratings provided no significant increase or decrease in T-scores reflective of attentional characteristics consistent with DSM diagnosable ADHD. Somatic symptoms reported by parents improved on the CBCL when comparing symptoms at diagnosis to symptoms after 6 months on the GFD (p=0.051)



Graph 1: CBCL Somatic T-score Pre and Post 6 Months of Gluten Free Diet (p=0.051)

Conclusion: This study is consistent with prior studies showing that patients with Celiac Disease demonstrate improvement in somatic symptoms on a gluten free diet. However, in our study we found no effect of a GFD on neurocognitive and behavioral functioning. Our pilot project is the first to evaluate change in neurocognitive and behavioral characteristics prospectively and with several well-established measures both parent reported and direct child assessment.

ABSTRACT 26.

THE RELIABILITY OF OXI-PNEMOGRAM FOR THE DIAGNOSIS OF GASTROESOPHAGEAL REFLUX DISEASE (GERD) IN INFANTS

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Background: Gastroesophageal reflux (GER), defined as the passage of gastric contents into the esophagus, is a common phenomenon in preterm infants and healthy neonates. But when the gastric contents cause troublesome signs or symptoms, it is called gastroesophageal reflux disease (GERD). The frequent coexistence of cardiorespiratory (CR) events (apnea, bradycardia, oxygen desaturation) and GER symptoms in infants gives the perception that there is association between these two events, and hence, has become the basis for the over-prescribing of antacid medications known to have significant adverse long term side effects in preterm infants. Therefore, many NICUs have adopted objective methods to diagnose GERD such as the multichannel intraluminal impedance (MII-pH) study. In the work up of evaluating infants with CR events, we used the non-invasive oxi-pneumogram and found a pattern which may help identify those patients that may benefit from MII-pH testing. We hypothesized that the oxi-pneumogram may be a surrogate that can reliably identify GER.

Objective: To evaluate the reliability of the oxi-pneumogram in identifying infants with GER. We hypothesize that compared to the MII-pH study, the oxi-pneumogram can reliably identify infants with GER admitted to the NICU.

Method: A prospective study of all neonates admitted to Stony Brook Children's Hospital NICU from December 2017 to the present who were thought to have GERD and received an MII-pH study for the evaluation of GER. Oxi-pneumogram data were obtained at the same time as the MII-pH study and evaluated for a pattern consistent with GER. The study was approved by the Institutional Review Board. Fifty-four subjects are needed for a sensitivity of ≥90% with a margin error of 15% and a specificity of ≥85% to demonstrate an alpha level of 0.05. Sensitivity and specificity will be used to evaluate the reliability of oxi-pneumogram.

Results: Thirty-two neonates weighing 650-4610g with gestational age 24-41 weeks were enrolled in the study since 12/2017 with a female to male ratio of 0.77:1. The sensitivity and the positive predictive values were 65% and 89% respectively of all patients but 80% sensitivity in those with CR symptoms.

Conclusions: Based on 32 recruited neonates, there is an increasing trend that participants with a positive oxi-pneumogram for the GER pattern are more likely to test positive for GERD on the MII-pH study.