Pediatric Research Day

A Showcase for Residents and Fellows

Wednesday, May 3, 2017
8 am to 1 pm
Charles B. Wang Center

Stony Brook Children's

SCHOOL OF MEDICIN
DEPARTMENT OF PEDIATRICS

Margaret M. McGovern, MD, PhD
The Knapp Professor and Chair of Pediatrics
Physician-in-Chief
Stony Brook Children's Hospital
Associate Dean for Ambulatory Operations

May 3, 2017

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

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

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

Thank you for joining us and showing support to these young investigators. Special thanks also to Dr. Marian Evinger and this year's Organizing Committee (Drs. Fischel, Glaubach, Lane, M. Parker, R. Parker, and Woroniecki) for coordinating the day. Also, we appreciate the entire faculty who have served as mentors to provide guidance and encouragement to our trainees.

Sincerely,

Margaret M. McGovern, MD, PhD
The Knapp Professor and Chair of Pediatrics
Physician-In-Chief, Stony Brook Children's Hospital
Associate Dean for Ambulatory Operations

2017 PEDIATRIC RESEARCH DAY

Wednesday, May 3rd
8 am – 1:30 pm
Charles B. Wang Center

8:00 – 8:30 **Registration and Breakfast** – Theater Lobby
8:30 **Welcome –-** Opening Remarks by Dr. Margaret McGovern – Main Theater
8:40 **Keynote Address – Main Theater**
Introduction of Keynote Speaker – Dr. A. Lane
8:50– 9:40 Keynote Speaker: **Brent Polk, MD**
Professor and Chair, University of Southern California
Keck School of Medicine Department of Pediatrics,

"Inflammatory Bowel Disease at the Interface of Microbes, Inflammation, and Regeneration: The Scientific Journey to Personalizing Care"

Platform Presentations – Main Theater

Session 1 (9:45-10:30)
9:45 **Introduction of Invited Judges –** Dr. R. Parker

9:50 -10:30 **Residents Platform Presentations** (Chair – Dr. R. Woroniecki)
Andrew Handel, MD "Determinants of Antibiotic Selection: An Analysis of Stated vs Actual Prescribing Habits among Pediatric Ambulatory Providers"
Asma Khan, MD "Knowledge Retention of PECARN Head Trauma Rule by Pediatric Residents"
Pooja Thimmappa, MD "Neonatal Hematologic Indices in Blood Culture Negative, Early Onset Sepsis in Term and Near Term Infants"
10:30 – 10:45 **Coffee Bre**ak - Theater Lobby

10:50- 11:10 **PEDsTalks** (Introduced by Dr. M. Evinger)
Andrew Handel, MD "For Generations to Come"
Aderonke Adefisayo, MD "The End of an Epidemic?"

11:15 – 11:40 **Fellows Platform Presentations** (Chair – Dr. J. Fischel)
Joan Salnave, MD "Maternal Antenatal Corticosteroid Therapy (ACT) between 30 and 34 Weeks Gestation and Neonatal Morbidity in Late Preterm and Early Term Infants"
Hina Zaidi, MD "Microbiology, Antibiotic Choice and Predictive Factors: Appendicitis Outcomes and Antibiotic Stewardship"

11:40 – 12:30 **Poster Session** - Theater Lobby (Chair Dr. T. Glaubach)

Invited Judges plus Drs. Glaubach and Woroniecki

12:30 – 1:20 **Lunch** – Zodiac Gallery
Dr. Polk to discuss his academic career path
Presentation of Awards and Closing Remarks by Dr. McGovern

Keynote Speaker Biography

Brent Polk, MD
Professor and Chair of Pediatrics
The Children's Hospital of Los Angeles
University of Southern California

Dr. Brent Polk was born and raised in Lonoke County, Arkansas. After graduating *magna cum laude* from Ouachita University, he earned his medical degree from the University of Arkansas for Medical Sciences in 1984. Dr. Polk completed his internship and residency at Arkansas Children's Hospital, followed by a fellowship in Pediatric Gastroenterology and Nutrition at Stanford University School of Medicine.

Upon joining the faculty at Vanderbilt University in Nashville, Dr. Polk established a remarkable career, contributing to discoveries in childhood disorders including fatty liver disease, glycogen storage disease, probiotics and pathways regulating intestinal repair and inflammation. In recognition of his research skills, he was appointed director of the University's NIH-sponsored Digestive Disease Research Center. Dr. Polk became a tenured professor of Pediatrics and Cell and Developmental Biology, and as division chief, quadrupled the size of this division, leading Vanderbilt to rename it the D. Brent Polk Division of Pediatric Gastroenterology, Hepatology and Nutrition.

In 2010 Dr. Polk became professor and chair of Pediatrics at the University of Southern California and Children's Hospital of Los Angeles and vice dean for child health. Dr. Polk is also director of the Saban Research Institute and professor of Biochemistry and Molecular Biology at the Keck School of Medicine.

Dr. Polk's service extends beyond his own institution: he is a member of the American Academy of Pediatrics, American Gastroenterological Association, American Pediatric Society, Society for Pediatric Research, and has served on the Board of Directors of the Association of Medical School Pediatric Departments Chairs. He is the only pediatrician to have served as chair of the American Gastroenterological Association Institute Council. Dr. Polk has chaired committees for the National Institutes of Diabetes and Digestive and Kidney Diseases, and served on Scientific Advisory Boards for the UCSF's Digestive Diseases Center, Mayo Clinic, Vanderbilt University, Washington University School of Medicine, St. Louis, and Cincinnati Children's Hospital Medical Center. Dr. Polk's research has been published highly regarded journals and he reviews for more than three dozen medical journals, including Cell, Gastroenterology, Journal of Clinical Investigation, Nature and Science.

Abstracts

Resident Platform Presentations

Fellow Platform Presentations

Resident Posters

Fellows Posters

NOTE: All Abstract Authors from Department of Pediatrics unless otherwise indicated.

ABSTRACT 1.

DETERMINANTS OF ANTIBIOTIC SELECTION: AN ANALYSIS OF SELF-REPORTED VERSUS ACTUAL PRESCRIBING HABITS AMONG PEDIATRIC AMBULATORY PROVIDERS

Andrew Handel, MD[1], Catherine Messina, PhD[2], Saul Hymes, MD[1]

[1]Department of Pediatrics, Stony Brook Children's Hospital, [2]Department of Family, Population & Preventive Medicine, Stony Brook Medicine, Stony Brook NY

Background: Studies have shown 30-50% of outpatient antibiotic prescribing is inappropriate: defined as overly broad, wrong duration, used to treat viral infections, or is not adherent to Clinical Practice Guidelines (CPGs). Yet, few studies have examined prescribing and CPG knowledge in detail.

Objectives: To analyze self-reported antibiotic knowledge, attitudes, & practices (KAP) and actual prescribing for common pediatric infections. Data was analyzed in order to 1) determine if KAP responses and actual prescribing were appropriate, 2) compare self-reported knowledge to actual prescribing, and 3) identify possible future opportunities for intervention.

Methods: We conducted a two-part study: 1) a survey assessing antibiotic prescribing-related KAP for common pediatric conditions and 2) a retrospective review of outpatient antibiotic use in the Stony Brook Children's Hospital (SBCH) Electronic Health Record (EHR) from 10/2014-9/2015 for the same conditions. CPGs were used to define appropriate antibiotics for each condition. Participants included private & academic-based pediatricians and academic pediatric emergency physicians. Survey responses were analyzed descriptively.

Results: Fifty-seven pediatricians responded to 255 surveys (22% response rate). Only 34% of responses achieved a knowledge score over 90%. Mean knowledge scores varied significantly ($p<0.001$) by infection type, with participants scoring 94% correct for otitis media, 71% for strep pharyngitis, and 67% for pneumonia. Academic providers performed better than private practitioners ($p<0.001$). Appropriate self-reported antibiotic knowledge was correlated, via linear regression, with SBCH EHR data on appropriate actual prescribing ($p<0.001$).

Conclusion: Self-reported appropriate antibiotic prescribing knowledge varied by type of infection. Stony Brook's adherence to CPGs for both self-reported antibiotic knowledge and actual prescribing (~80%) was similar to published pediatric antibiotic data, suggesting survey studies may be useful in settings where objective prescribing data are unavailable. Future interventions should target those conditions where knowledge and prescribing were less adherent to CPGs.

Table

Survey Results			
	>90% appropriate % (*n*)	**75-90% appropriate** % (*n*)	**<75% appropriate** % (*n*)
All respondents (n=53)	34% (17)	40% (20)	26% (13)
By Setting			
Private practice (n=18)	5.6% (1)	44.4% (8)	50% (9)
Academic (n=32)	40.6% (13)	37.5% (12)	21.9% (7)
EHR Data (SBCH only)			
Condition	**1st line antibiotic**	**Appropriate non-1st line**	**Inappropriate non-1st line**
Otitis media (n=2827)	70.5% (1994)	8.0% (224)	21.5% (609)
Strep Pharyngitis (n=655)	82.7% (542)	4.6% (30)	12.7% (83)
Pneumonia (n=469)	76.8% (360)	3.2% (15)	20.0% (94)

ABSTRACT 2.

KNOWLEDGE RETENTION OF PEDIATRIC EMERGENCY CARE APPLIED RESEARCH NETWORK (PECARN) HEAD TRAUMA RULE BY PEDIATRIC RESIDENTS

Asma Khan DO, Devin Grossman, MD, Rahul Panesar, MD, and Ilana Harwayne-Gidansky MD
Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY

Background: Case-based discussion is an effective method to learn medicine. High-fidelity simulation is also a newer effective learning modality. However, limited studies are available on the effect of these interventions on long-term knowledge retention.

Objective: This study assessed the short-term and long-term knowledge retention of two different educational interventions aimed at teaching residents the PECARN Head Trauma tool. We predicted that, regardless of modality, residents would have preserved knowledge of the PECARN tool.

Methods: This was a prospective, randomized-controlled study. PGY-1 pediatric residents at a single center were randomized into one of two educational strategies to learn the PECARN Head trauma tool. One group received a high-fidelity simulation with structured debrief (Group 1). The other group received a case discussion with structured debrief (Group 2). Baseline demographics and knowledge based on a standard clinical scenario were collected prior to the intervention. Standard scenarios were given immediately post-intervention and at 6 months post-intervention. Median tests were used to compare groups 1 and 2. Wilcoxon signed-ranks test were used to compare changes over time within groups.

Results: Between 2015 and 2016, 33 residents were enrolled. 15/33 (45%) residents completed the study. There was no statistically significant difference between the 2 groups at baseline, immediately post intervention or at 6 months (Table 1). Both groups had improved test scores immediately following intervention. Scores for both groups declined at 6 months post-intervention, although this was not statistically significant for group 2. Both groups had improved test scores at 6 months compared to baseline, although this was not statistically significant for group 1 (Table 2).

Conclusion: Regardless of modality, a single targeted educational encounter can improve short- term knowledge retention of the PERCAN Head trauma tool. It is possible that targeted intervention may prolong knowledge retention at 6 months, although further studies are needed.

Encounter	Group 1 (n= 8)	Group 2 (n= 7)	P-value (group 1 vs. group 2)[1]
Baseline (Median, IQR)	35 (15,64)	14 (0, 71)	0.722
Post-Intervention (Median%, IQR)	100 (86,1)	86 (71,100)	0.252
6 Months Post-Intervention (Median%, IQR)	78 (43,86)	71 (57,86)	0.096

Table 1: Median scores at baseline, immediately post intervention and 6 months post- intervention for groups 1 and 2. [1] Median test.

Time interval	Group 1 (n=8) (Median%, IQR); p-value[2]
Baseline to Post- Intervention	56 (24,86); **0.021**
Post-Intervention to 6 months	-15 (-43,-7); **0.018**
Baseline to 6 months	34 (-4,57); 0.090

Table 2A: Median interval change in score at each time period for simulation group. [2] Wilcoxon signed-ranks test.

Time interval	Group 2 (n=7) (Median%, IQR); p-value[2]
Baseline to Post- Intervention	57 (0,86); **0.046**
Post-Intervention to 6 months	-28 (-29,0); 0.345
Baseline to 6 months	49 (15,57); **0.042**

Table 2B: Median interval change in score at each time period for case discussion group. [2] Wilcoxon signed-ranks test

ABSTRACT 3.

NEONATAL HEMATOLOGIC INDICES IN CULTURE NEGATIVE EARLY ONSET SEPSIS IN TERM AND NEAR TERM INFANTS.

P. Thimmappa MD[1], C. Messina, PhD[2], S. Sridhar MD[1,3]
Department of Pediatrics[1,] Department of Preventative Medicine[2], Division of Neonatology[3] Stony Brook Children's Hospital, Stony Brook, NY

Background: Sepsis in newborns occurs primarily in the setting of chorioamnionitis/placental/fetal membrane infection (funisitis). Complete blood count (CBC) screening is performed to detect early onset sepsis in at risk infants. However, even in the absence of chorioamnionitis or clinical symptoms, some infants are treated with antibiotics due to abnormal CBC values.

Objective: To examine the association between abnormal white blood cell count (WBC), I/T ratio = (immature forms) / (total neutrophils + immature forms), c-reactive protein (CRP), presence of degenerative neutrophils and funisitis in well appearing near term or term (> 35 weeks gestational age) infants (NTTI) with negative blood cultures, and to examine the association with the use of antibiotics for presumptive sepsis.

Methods: We analyzed data in the retrospective cohort of NTTI who underwent testing for presumed early onset sepsis between Jan 2015-Dec 2015. NTTI admitted for known maternal chorioamnionitis were excluded from the study.

Results: Of the 99 NTTI, 69 had placental pathology available, and of those 16 (23.2%) had histological evidence of funisitis. I/T ratios and 12hr and 24hr CRP (mg/L) values are presented in Table 1. The negative predictive value for degenerative neutrophils and WBC >30x10^9/L were at 93% and 84% respectively. Of the infants that received antibiotics, 17% in the >48 hour group and 14% in the ≤48 hour group showed funisitis all had significant IT ratios and/or elevated CRP (Table 1).

Conclusions: In our study population, elevated I/T ratio and/or elevated CRP correlated with fetal membrane infection/inflammation. Routine CBC appears to be less helpful in guiding management for infants with early onset sepsis. Since placental histopathology is not always available at the time of initial sepsis evaluation, we plan to explore the utility of other biomarkers such as IT and CRP, along with the other clinical severity illness scores in future prospective studies.

Table 1. Correlation between neonatal hematologic indices, funisitis (FS), and antibiotic treatment (Abx) duration

Hematologic Indices	FS (n=16)	No-FS (n=53)	P value [a]	Abx >48hr (n=46)	Abx≤48hr (n=53)	P value [b]
WBC >30x10^9/L	13%	2%	0.06	15%	5%	0.11
IT>0.2	56%	24%	0.01	54%	22%	0.01
CRP (mg/L)>1 at 12hr	62%	25%	0.01	43%	22%	0.02
CRP (mg/L)>1 at 24hr	68%	35%	0.02	63%	30%	0.01
Toxic granulations (%)	19%	7%	0.18	17%	9%	0.24
Vacuolated granulocyte (%)	13%	11%	0.87	15%	11%	0.56

WBC- white blood cell count, mg-milligram, L-liter, IT-ratio of immature forms to total neutrophils + immature forms, CRP-c-reactive protein, hr-hours, a-difference between FS and non-FS, b-difference between Abx >48hr and ≤48hr

ABSTRACT 4.

MATERNAL ANTENATAL CORTICOSTEROID THERAPY (ACT) BETWEEN 30 AND 34 WEEKS GESTATION AND NEONATAL MORBIDITY IN LATE PRETERM AND EARLY TERM INFANTS

Joan Salnave MD,MPH[1], James Bernasko MD[2], Catherine Messina PhD[3] Shanthy Sridhar MD[1]:
[1]Department of Pediatrics/Neonatology, [2]Department of Obstetrics/Gynecology, [3]Department of Family, Population, and Preventive Medicine, Stony Brook Children's Hospital: Stony Brook School of Medicine Stony Brook, NY 11794

Background: Prematurity is associated with numerous neonatal morbidities. Late prematurity (34 - 36 6/7 wk) accounts for the majority of preterm births. Antenatal corticosteroids (ACT) are known to ameliorate numerous neonatal morbidities, however the extent of the benefit in late preterm infants is still being investigated. We hypothesize that ACT administered in pregnancies eventually resulting in late prematurity will be associated with improvement in respiratory and metabolic neonatal outcomes.

Objective: To examine whether ACT received between 30-34 weeks improves outcomes among late-preterm (34- 36 6/7 wk) and early-term (37- 37 6/7 wk) neonates.

Design/Methods: This was a retrospective cohort study of infants born between 34- 37 6/7 wk and admitted to Stony Brook Children's NICU during 2013-2014.Multiple logistic regression models were employed to examine whether ACT exposure improved neonatal outcomes in late preterm and early term neonates. Covariates include maternal comorbidities such as gestational hypertension, diabetes and chorioamnionitis and neonatal covariates such as gestational age and birthweight to account for possible confounders.

Results: Of the 555 subjects, 13% of the infants were exposed to ACT. There were more babies diagnosed with RDS ($P<0.04$) and with feeding problems in the ACT group ($P=0.01$). SNAPPE II (Severity of Illness) scores and maternal comorbidities were similar in both groups.

Outcomes	ACT Exposure (n=65)	No ACT (n=491)	P value	Odds Ratio 95% Confidence Interval
Air Leak	3 (3.2%)	22 (4.8%)	0.98	1.01 (0.03- 3.48)
Surfactant	1 (1.1%)	10 (2.2%)	0.77	0.73 (0.931- 5.86)
TTN	10 (15.1%)	71 (14.6%)	0.13	1.46 (0.88- 2.224)
RDS	12 (18%)	45 (9.3%)	0.04**	1.8 (1.01- 3.329)
Nasal Cannula	2 (2.4%)	37 (7.6%)	0.12	1.71 (0.86- 3.39)
CPAP	17 (26%)	127 (26.2%)	0.99	0.99 (0.63- 1.562)
IMV/Vent	8 (12.3%)	11 (2.3%)	0.98	1.01 (0.56- 1.80)
No intervention	31 (47.6%)	308 (63%)	0.23	0.83 (0.61- 1.12)
Hypoglycemia	21(32.3%)	133 (27%)	0.36	1.29 (0.75-2.27)
Hyperbilirubinemia (on Phototherapy)	26 (40%)	157 (32.1%)	0.19	1.4 (0.8-2.4)
Feeding Problems	54 (82.8%)	328 (67%)	0.01**	2.4 (1.24-4.79)
$P<0.05$ is considered significant TTN: Transient Tachypnea of the Newborn, RDS: Respiratory Distress Syndrome, CPAP: Continuous Positive Airway Pressure, IMV: Intermittent Mandatory Ventilation				

Conclusions: ACT exposure between 30- 34 weeks was not associated with lower rates of RDS and feeding problems in late preterm and early term infants, suggesting no clear benefit of ACT in this sample. Further research perhaps with a larger matched cohort may reveal benefits not appreciated in this study.

ABSTRACT 5.

MICROBIOLOGY, ANTIBIOTIC CHOICE AND PREDICTIVE FACTORS: APPENDICITIS OUTCOMES AND ANTIBIOTIC STEWARDSHIP

Hina Zaidi, MD[1], Catherine Messina PhD[1], Saul Hymes MD[1]
[1]Stony Brook Children's Hospital, Long Island, NY

Background: Appendicitis is the most common visceral pediatric surgical emergency and it is the 2nd highest antibiotic-using condition. In the era of antibiotic stewardship, the interaction between underlying microbiology, and both adverse outcomes and antibiotic choice has not been recently examined.

Objective: To review patients with complicated appendicitis (CA) (defined as perforation, abscess, or a gangrenous or necrotic appendix) to 1) determine local pathogen prevalence and susceptibilities 2) identify bacteriologic & non-bacteriologic factors for adverse outcomes & 3) assess adherence to local antibiotic guidelines.

Design: Single center retrospective chart review of CA patients ages 1-18 years from 2013-2015, post-initiation of guidelines. Patient demographics, BMI, clinical presentation, labs including intra-operative appendiceal cultures, imaging, postoperative findings, antibiotics received, and adverse outcomes, were reviewed.

Results: Seventy-nine CA subjects were analyzed. The most common pathogen isolated was *E. coli* (n=1 resistant to Zosyn). *Pseudomonas* was isolated in only 6.5 % of all positive cultures. Adverse outcomes developed in 24/79 (30%); abscess formation was most common (42%). Abnormal BMI, initial band count >10% or positive cultures, regardless of number or type of bacteria seen, were all statistically significantly associated with adverse outcomes. Demographics, symptom days, initial WBC or neutrophil count, imaging showing perforation or gross appendix, and specific culture results were not significantly associated with adverse outcomes. Compliance with pre-operative antibiotic guidelines was 63%, post-operative was 86%.

Conclusions: In this review, pathogen type was not associated with appendicitis adverse outcome, though BMI and bandemia were, and may be useful for risk-stratification. *Pseudomonas*, historically thought of as an important organism in appendicitis, was not a high burden locally, nor were highly resistant pathogens isolated. Antibiotic coverage against these organisms, currently part of many national guidelines, may not be needed. Additionally, guideline compliance was poor, reflecting another area for education and antibiotic stewardship in the future.

ABSTRACT 6.

DOES PRE-MEDICATED INHALED ANESTHESIA IMPACT THE TIMING OF ENDOSCOPY PROCEDURES IN PEDIATRIC PATIENTS?

Jenna Ali MD[1], Michelle Tobin MD[1,2]

[1] Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY

[2] Division of Pediatric Gastroenterology, Stony Brook Children's Hospital, Stony Brook, NY

Background: Endoscopic procedures are a key step in evaluating and treating gastrointestinal diseases in children. Resources remain limited while endoscopy demand grows. This unequal supply and demand is challenging endoscopy centers to improve their efficiency while maintaining the highest quality. The duration of procedure is not the rate-limiting step in efficiency; factors before and after the procedure are more critical. Intravenous line placement (IV) in the endoscopy room under anesthesia vs. placement prior to being taken to the endoscopy room has been identified as a limitation of efficiency. It requires skill, time and patience, particularly in children. Some patients are pre-medicated with inhaled anesthesia (PMIA) for IV placement to overcome their fear. However, this delays initiation of endoscopic procedures; a concept never formerly recorded or analyzed.

Objective: To determine factors associated with use of PMIA for IV placement and if it leads to increased time to initiation of procedures in the endoscopy room.

Design: Retrospective review of electronic medical records of children undergoing an endoscopy between 08/2016-03/2017. Data on demographics, time of initiation of endoscopy in the endoscopy room with and without use of PMIA was collected and analyzed via two tailed t-test and chi squared testing.

Results: 54 subject had PMIA prior to IV and 180 subjects had no PMIA. Children in PMIA group were younger than those without; 6.45 ± 3.8 years vs. 13.82 ± 4.1years, ($p<0.05$). There was no difference in gender between the groups. PMIA group took 1.25x longer to initiate their procedure compared to non-PMIA once in the endoscopy room ($p<0.05$). See Table 1.

Conclusions: Younger children more often require PMIA prior to IV placement. PMIA delays start time of endoscopy procedures after arriving in the endoscopy room. Utilization of cognitive behavioral techniques and pharmacological alternatives can be used to prevent need for PMIA.

Table 1: Demographic and Time Lapse Data

Subjects	PMIA (n=54)	Non-PMIA (n=180)	*P*-value
Age of patients (years)	6.5 ± 3.8	13.8 ± 4.1	<0.0001
Males (%)	54	52	0.79
Time Lapse from Arrival to Suite to Scope (min)	14 ± 7	8 ± 4	<0.0001

ABSTRACT 7.

IMPROVING RECOGNITION OF PEDIATRIC HYPERTENSION IN THE PEDIATRIC CARDIOLOGY AMBULATORY SETTING

Michael Bykhovsky MD, Catherine Messina, PhD, James Nielsen MD, Peter Morelli MD, Kathleen Walsh MD, Stuart Holzer MD, Marybeth Heyden DNP, Laurie Panesar MD

Background: Pediatric hypertension (HTN) is a common modifiable risk factor for premature atherosclerotic heart disease in adulthood. End-organ damage has been demonstrated in children with HTN making early recognition and treatment essential. Despite published guidelines for screening, HTN continues to be under recognized.

Objective: 1) To improve recognition and documentation of pre-hypertension (pre-HTN) and HTN in the Stony Brook pediatric cardiology clinic. 2) To evaluate congenital heart disease (CHD) and anthropomorphic measurements had association with recognition of pre-HTN/HTN.

Methods: We examined records of 468 children aged 1 to 18 years seen at SBPC. Two PDSA (Plan, Do, Study, Act) cycles were completed; 1st tested the effect of making 4th Report blood pressure (BP) tables available at triage, and 2nd cycle tested the use of an online BP percentile calculator. Demographics, age, sex, weight, height, BMI, and BP were recorded. We recorded presence of CHD and physician recognition of elevated BP.

Results: Documentation of elevated BP by nursing staff decreased significantly after implementation of the BP percentile calculator compared to pre-intervention ($p<0.05$) and PDSA cycle I ($p=0.02$), but not after 4th report availability ($p=0.63$). Physician recognition of pre-HTN and HTN did not improve after either intervention ($p=0.65$). HTN was recognized more often than pre-HTN in both PDSA cycles ($p=0.01$). BMI > 95th percentile was associated with increased physician recognition of elevated BP (OR 3.2, 95% [CI], 1.2-8.7; $p=0.02$) as well as increasing patient age (OR 1.1, 95% [CI], 1.02-1.25; $p=0.01$). Patient sex, weight, height and CHD were not associated with hypertension recognition.

Conclusions: The decreased documentation of elevated BP after implementation of the BP percentile calculator likely represents improved nursing recognition of pre-HTN and HTN, despite lack of improvement in physician recognition. Incorporation of a BP percentile calculator within the EMR may improve recognition of elevated BP in the outpatient setting.

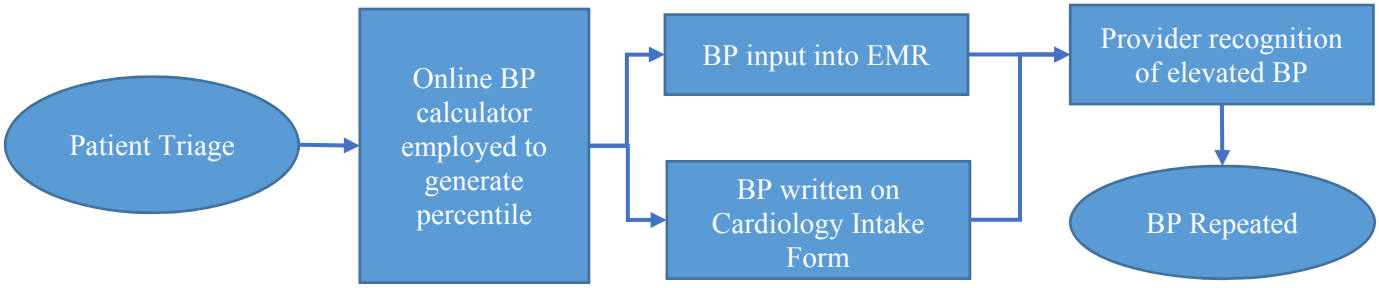

Figure: Process map for PDSA Cycle to evaluate the use of the online BP calculator.

ABSTRACT 8.

STRONGYLOIDES INFESTATION IN RHEUMATIC DISEASES: A CASE REPORT WITH LITERATURE REVIEW

Joseph Cafone MD, Swosty Tuladhar MD, and Qingping Yao MD

Background:
Strogyloidiasis is caused by the parasitic organism, strongyloides stercoralis and can present with asymptomatic eosinophilia to disseminated multisystem hyper-infection syndrome in an immunocompromised host. The infection rate in patients with rheumatic diseases is unknown in the era of biologics, and there are no management guidelines available in the scenario of coexisting strongyloides infestation and rheumatic diseases.

Objective:
Herein, we report a case of rheumatoid arthritis (RA) with strongyloides infestation, and in conjunction with literature review, we proposed management recommendations prior to initiation of Anti-TNF medications.

Methods:
We performed a literature search of PubMed database using the keywords: strongyloides and arthritis or rheumatoid arthritis or rheumatic disease or lupus for the publications between 1997 and 2017 in the English language. The search resulted in a total of 64 papers, of which 14 single case study articles were relevant, eligible, and obtainable for inclusion in our study.

Case Presentation:
A 53-year-old Honduran male with the diagnosis of seropositive RA had been treated with hydroxychloroquine, leflunomide, and adalimumab since 2011. Despite therapy, he complained of bilateral pain and stiffness without signs of synovitis. He had persistent eosinophilia since the initial presentation of RA. The patient denied any abdominal pain, diarrhea, or rash. Due to eosinophilia, serologic testing for parasitic infestations revealed elevated strongyloides IgG antibodies. In consultation with an infectious disease specialist, the patient was treated with Ivermectin 200 mcg/kg for two days.

Results:

Age	Sex	Ethnicity	Disease	Medication	Presenting Symptoms	Lab Results	Diagnosis	Treatment
Avg: 50	F: 8 M: 7	C/S America: 5 Asia: 4 Europe: 2 Middle East: 1 Australia: 1	RA: 9 SLE: 6	Prednisone: 13 Anti-TNF: 4 Methotrexate: 3 Cyclophosphamide: 2 Azathiprine: 2	Gastrointestinal: 9 Pulmonary: 5 Hyper Infection: 2 Asymptomatic: 1	Eosinophilia: 5 Anemia: 3 Increased IgE: 1	BAL: 5 Stool: 4 Serology: 3	Ivermectin: 11 Albendazole: 3

Data obtained from case reports and literature review (N=15)

Sixty per cent (9/15) of the reported cases were from Asia and Central / South America. These patients were on immunosuppressive agents, including 86% (13/15) of patients on chronic use of glucocorticoids and 33% (5/15) on TNFa inhibitors (adalimumab and etanercept). The infected patients most often presented with gastrointestinal or pulmonary symptoms 82% (14/17). The laboratory findings were eosinophilia, elevated IgE, and / or anemia. The diagnostic methodologies used were stool cultures, bronchial alveolar lavage cultures, gastric biopsy, and serologic testing. Seventy-three per cent (11/15) of patients discontinued the immunosuppressive medications prior to the initiation of treatment with ivermectin.

Conclusion
Strongyloides stercoralis infestation can occur in patients with RA and SLE. Patients with these diseases if they are from Asia and Central/South America may be screened for the parasitic infection; patients with a long-term use of both glucocorticoids and/or TNFa inhibitors may be at an increased risk for the infection. Therefore, these medications may be held or avoided during the infection. The presence of gastrointestinal and/or pulmonary symptoms, or eosinophilia of unclear etiology may alert physicians of the potential parasitic infestation.

ABSTRACT 9.

HIGH INCIDENCE OF ATOPY IN YOUNG CHILDREN WITH EOSINOPHILIC ESOPHAGITIS

Sunny Chang MD[1], Michelle Tobin MD[2], Rupinder K Gill MD[2] and Susan Schuval MD[3]
[1]Department of Pediatrics, Stony Brook Children's Hospital, Stony Brook, NY
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Background: Eosinophilic esophagitis (EoE) has been strongly associated with atopy in children and adults. However, there is a paucity of data regarding young children with this disease.

Objective: To examine the epidemiology and clinical presentation of EoE in children < 6 years of age in order to identify risk factors for disease development and progression.

Methods: We retrospectively studied electronic medical record of 28 children diagnosed with EoE < 6 years of age who met EoE diagnostic criteria and were identified via ICD-9 code (530.13).

Results: The average age at diagnosis was 2.8 ± 1.6 years. There were 21 males and 7 females: 43% had eczema, 39% had asthma, and 29% had allergic rhinitis. The most common presenting symptoms were vomiting (64%) and failure to thrive (43%). Milk allergy had been diagnosed in 39% of patients. Histopathology revealed a mean eosinophil count of 42 eosinophils/hpf in the mid esophagus and 63 eosinophils/hpf distally. Positive prick skin tests to at least one environmental antigen were seen in 39% of children and 64% had a positive prick skin test to at least one food allergen. The most common food allergens were egg white (75%) and soy (61%). Most common environmental allergens were tree pollen (32%), grass pollen (25%), and dust mite (25%).

Conclusions: As reported in older children and adults, there is a high incidence of atopic disorders including eczema, asthma, food allergies, and allergic rhinitis in young children with EoE. The presence of atopy, along with vomiting or failure to thrive in young children, may be suggestive of EoE, and should prompt consideration for earlier diagnostic interventions. Additional studies of this population are needed to clarify the specific nature of the association between atopy and EoE.

ABSTRACT 10.

RARE CASE OF AN ISOLATED ANOMALOUS SINGLE CORONARY ARTER FROM THE PULMONARY ARTERY IN A FIVE-WEEK OLD INFANT

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Introduction:

An anomalous single coronary artery from the pulmonary artery (ASCAPA) is an extremely rare congenital anomaly with the majority of the reported cases being diagnosed postmortem via autopsy [1]. We present a 5-week old infant who was diagnosed with isolated ASCAPA after presenting to our hospital in respiratory distress secondary to bronchiolitis.

Case Description:

A 5-week-old female weighing 3kg presented with poor weight gain and acute respiratory distress, found to have parainfluenza bronchiolitis. Parents denied any symptoms of cyanosis, tachypnea, diaphoresis or breathing difficulties with feeds. Her chest x-ray showed marked cardiomegaly. A 12-lead electrocardiogram did not show ST elevations or pathological q-waves (Figure 1). Her echocardiogram (ECHO) revealed a severely dilated left ventricle with severely decreased global systolic function (13% shortening fraction), moderate mitral regurgitation, moderate RV/PA hypertension and what appeared to be a single coronary artery arising from the left aortic sinus. There was prominent flow seen in the right coronary artery which coursed intra-arterial between the aortic and pulmonary roots. The left coronary, also had prominent flow, bifurcated into a dilated (+3.3 z-scores) left anterior descending and a circumflex artery. There were no other structural abnormalities (Figure 2).

Patient was then transferred and cardiac catheterization showed elevation of the RV pressure at about 80% of her systemic pressure and LVEDP was severely elevated at 20mmHg. Angiography demonstrated a single coronary artery arising from the posterior and rightward side of the main pulmonary artery, near the junction of the proximal RPA (Figure 3).

The patient underwent coronary artery reimplantation after cardiac catheterization. By nine months following her operation, her ECHO demonstrated globally normal systolic LV function with moderate mitral regurgitation, and all supportive medications were discontinued.

Discussion:

An isolated ASCAPA is an extremely rare congenital anomaly and chances of survival past the first few weeks of life are low. This infant's persistent elevated PVR aided in her survival. This case illustrates the challenges of diagnosing ASCAPA via echocardiogram alone, and one must have a high index of suspicion for this lesion in any patient with unexplained dilated cardiomyopathy in the setting of a single coronary artery.

ABSTRACT 11.

DEFINITIONS AND PREVALENCE OF LEFT VENTRICULAR HYPERTROPHY IN HYPERTENSION AND OBESITY; A SYSTEMATIC REVIEW OF PEDIATRIC ECHOCARDIOGRAPHIC STUDIES.

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Background: Left ventricular hypertrophy (LVH) is an important end point and therapeutic target in the management of hypertension (HTN), and/or obesity-associated cardiovascular disease. However, LVH prevalence in children is unclear partly due to multiple LVH definitions.

Objective: To perform a systematic review of literature to report the prevalence of LVH determined by echocardiography (ECHO) in children with HTN and/or obesity.

Methods: A PubMed, EMBASE, CINAHL, Cochrane Library, SCOPUS and LILACS search using the keywords 'left-ventricular hypertrophy', 'cardiac hypertrophy', 'hypertension', 'obesity', 'echocardiography', 'pediatric', 'child' and 'adolescent' was performed. Full articles published in English language on children 0-21 years of age in the past 15 years were considered. Subjects with kidney transplantation or chronic kidney disease were excluded. We examined prevalence of LVH based on 4 definitions and left ventricular mass index (LVMI): Table.

Results: Our search yielded 859 articles. 699 articles were rejected after title and abstract screening and 104 after full text screening. 56 studies met all inclusion/exclusion criteria and were included in the final analysis. There were 9952 subjects, aged 13.1y±2.6, with average systolic blood pressure 120.9±11.2, and body mass index of 25.4±4.5. 56.8% of subjects were males. 28.6% (16/56) and 32.1% (18/56) studies reported Caucasian and African-Americans race, respectively; with 52.7% Caucasians (1517/2878 subjects) and 46.7% African-Americans (1223/2621 subjects). LVH criteria and/or prevalence were not reported in 36 studies even though LVMI was reported in all studies. LVH data is presented in Table.

Conclusions: LVH remains frequent ECHO biomarker of cardiac damage in HTN children. However, multiple definitions result in highly variable estimation of LVH prevalence and thus present a challenge to diagnostic and therapeutic interventions in HTN management. More consistent normative left ventricular mass data from large populations of healthy and obese children are required for cardiovascular diagnostics and research in HTN.

LVMI cutoff used for definition:	LVH prevalence (%)	95% Confidence Intervals
> 51 $g/m^{2.7}$	12.5	10.7-14.2
>38.6 $g/m^{2.7}$ (Daniels et al.)	29.3	27.5-31.1
> 95th-tile height-specific LMS reference (Foster et al.)	8.9	4.8-13.0
>95th-tile for gender and chronological age (Khoury et al.)	24.2	22.15-26.25
Overall	18.7	17.7-19.7

ABSTRACT 12.

A FAMILY WITH MULTIPLE ENDOCRINE NEOPLASIA SYNDROMES (MEN): THE ETHICAL FACTORS OF GENETIC TESTING FOR ADULT ONSET FAMILIAL GENETIC SYNDROMES

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Background: The Multiple Endocrine Neoplastic Syndromes (MENs) are well recognized entities with localized genes and established inheritance pattern. We present a case of a father exhibiting manifestations of MEN2A syndrome and the subsequent genetic testing of his children.

Case: A 34 year old man with a history of Hirschsprung's disease diagnosed at birth presented with a pheochromcytoma and medullary thyroid cancer at age 33 years. Tumor DNA studies revealed a mutation (p.Cys620Arg) in the *RET* gene. He arrived to the genetics clinic to have his three asymptomatic children, aged 3 years and dizygotic twins, aged 17 months to be evaluated and tested. Twin 2 was found to have a mutation (p.Cys620Arg) of the *RET* gene. The father was advised that his asymptomatic parents and siblings should be tested for the same *RET* gene mutation.

Discussion: This family case portrays the variability of genetic expression for MEN 2A syndrome. Furthermore, it demonstrates the various challenges and considerations of performing genetic testing in children. One must consider whether an early diagnosis will lead to a beneficial intervention. For MEN2A, consideration for prophylactic intervention is recommended in the preschool age but other diseases do not offer a treatment benefit in childhood. Other ethical considerations involve patient and parent autonomy along with the psychological burden of carrying a genetic diagnosis through childhood.

Conclusion: Clinicians can best help family members by clearly informing patients who test positive for Genetic conditions about the risks faced by their family members, discussing the value of disclosure, and offering assistance with it. It is essential to have a comprehensive conversation with family members regarding the risks, benefits, and timing of genetic testing for any familial syndrome.

ABSTRACT 13.

LONGITUDINAL AND HORIZONTAL COMPARISONS OF A PEDIATRIC-SPECIFIC ANTIBIOGRAM AT STONY BROOK CHILDREN'S HOSPITAL

Matthew Fisher, MD; Saul R. Hymes, MD

Background: In the era of increasing antibiotic resistance, clinicians must rely on antibiograms to make more informed decisions when starting empiric therapy. Pediatric institutions have recognized that organisms affecting children may have different susceptibilities compared to adults, and have developed pediatric-specific antibiograms to provide more accurate data.

Objective: We constructed an antibiogram derived exclusively from bacterial cultures isolated from pediatric patients at Stony Brook Children's Hospital in order to: 1) Describe differences in the antimicrobial susceptibility profiles compared to the hospital-wide antibiogram and, 2) Identify changes in susceptibility patterns over time.

Design: Bacterial culture and susceptibility data were obtained from all positive cultures from January-December 2015 from the Pediatric ED, 11N (General Pediatrics), 11S (Hematology-Oncology), PICU, NICU, & outpatient lab. Organisms with 10 or more individual samples were included. Repeat cultures from the same patient encounter were excluded. The percentage of isolates susceptible to tested antibiotics was calculated. Susceptibility data were compared with the 2015 hospital-wide antibiogram as well as a 2011 pediatric-specific antibiogram from this institution.

Results: Susceptibility patterns of ten organisms are reported in Table 1. Comparing pediatric isolates to the hospital antibiogram, *E. coli* was more susceptible to ciprofloxacin (87% vs. 65%); *S. aureus* was more susceptible to clindamycin (72% vs. 63%); and *Pseudomonas* was more susceptible to meropenem (84% vs. 68%) and ciprofloxacin (77% vs. 62%), but more resistant to amikacin (84% vs. 94%). Comparing pediatric data from 2011 & 2015, *E. coli* resistance increased to 9 of 13 antibiotics by an average of 8.7% (median 7%); MRSA rates were similar (56% vs. 54%). *Pseudomonas* was more resistant to 2 of 6 antibiotics.

Conclusion: Pediatric *E. coli* resistance increased over a 5-year period; data supporting increasing *S. aureus* and *Pseudomonas* resistance was limited. The pediatric antibiogram should be used to tailor antibiotic therapy to pediatric patients.

Table 1. Percent of isolates that were susceptible

Antibiotic Susceptibility for **Gram-positive cocci**	# isolates tested	ampicillin	ceftriaxone	clindamycin	erythromycin	gentamicin	tetracycline	ciprofloxacin	levofloxacin	oxacillin	penicillin G	tmp-smz	rifampin	vancomycin	linezolid	nitrofurantoin
Staphylococcus aureus	113	nt	nt	72	36	97	91	66	67	56	nt	97	99	100	100	100
Enterococcus faecalis	38	97	nt	nt	11	74	16	92	92	nt	97	87	nt	100	100	100
Strep. agalactiae	27	100	nt	44	37	nt	18	nt	100	nt	100	nt	nt	100	100	nt

Antibiotic susceptibility for **Gram-negatives**	# isolate tested	ampicillin	Ampicillin Sulbactam	amikacin	aztreonam	cefazolin	ceftriaxone	ceftazidime	ciprofloxacin	cefepime	gentamicin	meropenem	tmp-smx	piperacillin-tazobactam
Enterobacter aerogenes	9	nt	nt	100	67	0	56	56	100	100	100	100	100	67
Enterobacter cloacae	19	nt	16	100	84	6	79	84	95	100	100	100	74	84
Escherichia coli	212	38	53	100	92	83	92	92	87	92	85	100	63	91
Klebsiella pneumoniae	31	nt	74	100	81	77	81	81	90	81	90	97	87	77
Proteus mirabilis	26	65	85	100	100	92	96	92	88	100	96	100	65	100
Pseudomonas aeruginosa	59	nt	nt	84	nt	nt	nt	86	77	86	75	84	nt	84
Serratia marcescens	14	nt	nt	100	93	0	79	93	86	100	86	100	86	nt

ABSTRACT 14.

ASTHMA-RELATED HOSPITALIZATIONS AND EMERGENCY DEPARTMENT VISITS IN HISPANIC LIMITED ENGLISH PROFICIENCY FAMILIES: LANGUAGE, HEALTH LITERACY, OR BOTH?

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Background: Limited English Proficiency (LEP) patients may have decreased understanding of their diagnosis and treatments. The 2013 New York State Asthma Surveillance Summary reports the rate of Emergency Department (ED) visits and hospitalizations among Hispanics as double that of non-hispanics.

Objective: This is an exploratory study to describe English proficiency (EP) and health literacy (HL) of Hispanic caregivers of asthmatic patients of Stony Brook Children's Hospital. We hypothesized that LEP families have greater asthma hospitalizations and ED visits than EP families.

Methods: Subjects ages 0-17 years with asthma were recruited at inpatient and outpatient sites. Caregivers completed demographics including ED visits and hospitalizations in the past 2 years and validated EP and HL questionnaires; SAHL and STOHFLA (Table).

Results: To date, only 14 subjects were enrolled out of 21 screened, 8 were LEP and 6 were EP. Due to a small sample size, statistical interpretation was very limited and are mainly descriptive thus far. In addition, only 6/8 answered ED visits and only 5/8 answered hospitalizations questions in the LEP subjects. LEP subjects had a median of 1.5 ED visits, and 1 hospitalization. EP subjects had a median of 3 ED visits, and 2 hospitalizations. Despite the aforementioned limitations, our preliminary analysis interestingly showed that even in LEP subjects, a significant percentage have adequate health literacy. Adequate health literacy (AHL) was found in 62.5% (SAHL) and 87.5% (STOFHLA) in LEP subjects, and 100% (SAHL) ** and 83.3% (STOFHLA) in EP subjects (Table).

Conclusions: Preliminary findings show that LEP does not directly correlate to inadequate health literacy (IHL). It may be beneficial to focus efforts on continued health education with easy to understand materials, especially in the preferred language. Our goal is to continue to recruit subjects to reach our target sample size of 100 and re-evaluate our data.

Table:

SAHL Questionnaire

		IHL (≤14)	AHL (>14)	Total
EP	count	0	5	5
	% of total	0%	100%	100%
LEP	count	3	5	8
	% of total	37.5%	62.5%	100%

STOFHLA Questionnaire[+++]

		IHL (≤16)	AHL (≥23)	Total
EP	count	1	5	6
	% of total	16.7%	83.3%	100%
LEP	count	1	7	8
	% of total	12.5%	87.5%	100%

SAHL – short assessment of health literacy; STOHFLA – short test of functional health literacy in adults, questionnaires included questions from validated National Health Interview Survey (NHIS) and National Health and Nutrition Examination Survey (NHANES)
**One subject out of the 6 EP subjects did not complete the SAHL
EP-English Proficiency, LEP- Limited English Proficiency
IHL-Inadequate Health Literacy, AHL-Adequate Health Literacy
+++A score of 17-22 in the STOFHLA signifies marginal health literacy; none of the subjects fell in this category

ABSTRACT 15.

CORRELATION BETWEEN DEPRESSION SCREENING AND LENGTH OF STAY IN ADOLESCENTS ADMITTED TO A HOSPITAL FOR AN ACUTE ASTHMA EXACERBATION

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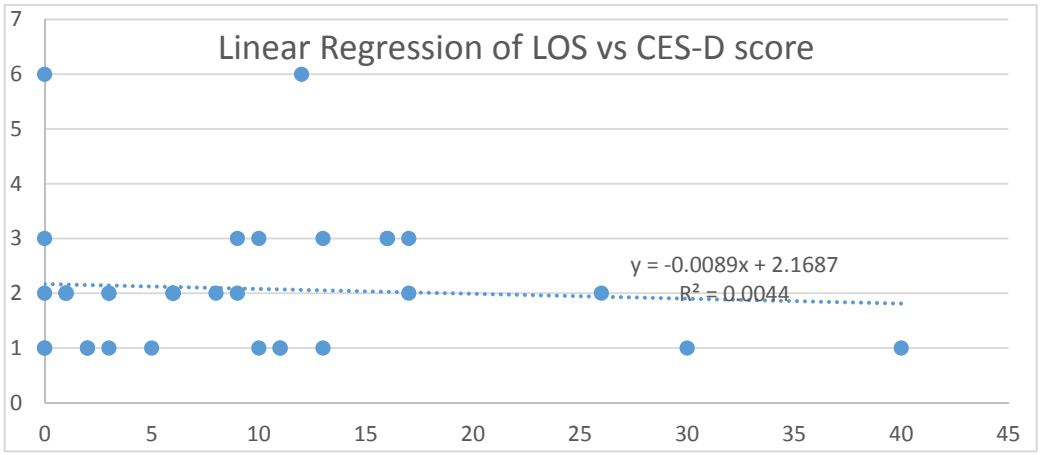
Background: Adolescents with asthma show a higher prevalence of anxiety and depression compared to controls. Factors that increase this risk may include recent asthma diagnosis, poor asthma control or physical impairment from asthma. However, no studies to date have looked into the association between depression and length of hospital stay (LOS) in asthma exacerbation.

Objective: To determine whether the presence of depressive symptoms in children admitted to the hospital with an acute asthma exacerbation correlates with the LOS.

Methods: Children ages 10-17, admitted for asthma exacerbation to the general inpatient pediatric service, were given validated questionnaire, the Centers for Epidemiological Studies Depression Scale (CES-D) within the first 24 hours of hospitalization. Questionnaire scores were compared with LOS and asthma severity. Pediatric ICU admission was an exclusion criterion, as administration of questionnaire within 24 hours may be difficult in the sicker population. The presence of concomitant viral illness through positive respiratory viral panel (RVP) screen was assessed as a covariate, as this may affect LOS.

Results: Of 34 patients enrolled (mean age 13, SD 1.84), 7 (21%) had a positive depression screen. Average LOS in screen negative subjects was 2.07 days; in screen positive 2.14 days ($p>0.05$). No correlation between severity of depression and LOS was identified through linear regression modeling ($R=-0.0664$, $R^2=0.004$, $p=0.71$). However, increasing asthma severity showed increasing depression score ($R=4.7$, $p=0.116$). LOS was not affected by viral status (14/23 positive RVP, $p>0.05$).

Conclusions: We found no correlation between depressive symptoms and LOS in children admitted to the hospital during an asthma exacerbation. However, results may be limited by small sample size and exclusion of PICU patients. Multiple factors including asthma control, severity, number of admissions, LOS and even including PICU patients to analyze this subgroup may be worthwhile to explore as we continue to increase our sample size.



LOS

CES-D depression score

LOS – Length of stay

CES-D score - the Centers for Epidemiological Studies Depression Scale questionnaire score

ABSTRACT 16.

AN EDUCATIONAL INTERVENTION TO INCREASE BIRTH DOSE OF HEPATITIS B VACCINATION

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Background: The WHO (2012) recommends administration of birth dose hepatitis B vaccine (HepBV) to prevent hepatitis B virus (HBV) transmission from mother-to-infant or household contact by an infected person. The likelihood of developing chronic liver disease is 90% if exposed to the HBV infection following birth. From 2012-2016, Stony Brook Children's (SBC) newborn nursery yearly HepBV rate was 63-71%. Health-care provider's knowledge and attitudes are an important factor toward maternal acceptance of HepBV birth dose. (WHO 2012)

Objective: To improve the vaccination rate of birth dose of HepBV at SBC to meet the New York State recommended rate of ≥85% before discharge

Design: A survey of knowledge, attitudes, and practices was distributed September 2016 to SBC Mother Baby Unit Nurses (MBUN) to identify barriers. An initial education intervention was developed; a Power Point on HBV, HepBV, and post- test administered to MBUN October 2016. A 2nd educational intervention was given January 2017 to each MBUN (57/64 nurses) with individualized discussion on the importance of HepBV. The group was also given a sample script for obtaining maternal permission for HepBV. Intervention data was collected and vaccination rates analyzed by SPSS 2013 Version 22.0.

Results: Completed surveys (34/64) administered to MBUN identified various barriers: staff education would be helpful to improve vaccination rates (82%); parent refusal is related to health care provider attitudes (68%). Post-test results identified 58% of MBUN answered incorrect on knowledge on the HepBV series. From onset of project, vaccination rates statistically increased (Chi square cross tabulation p=0.012, linear by linear association p=0.002), Table:

	Pre-intervention			Intervention 1			Intervention 2		
HepBV vaccination rate	Jul 2016	Aug 2016	Sept 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017
	75.1%	75.7%	71.7%	72.7%	71.6%	74.8%	80.1%	80.7%	82.80%

Conclusion: Health-care providers can influences parents' perception and improve knowledge on why the HepBV birth dose is recommended. HepBV rates improved with interventions but continued evaluation of practices that improve birth dose coverage and parent education strategies are necessary.

ABSTRACT 17.

ROLE OF AUTONOMY, CONSENT, AND ASSENT IN ADOLESCENT CANCER SYNDROMES

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Background: Lynch Syndrome is an autosomal dominant disorder caused by a germline mutation of one DNA mismatch repair (MMR) gene or loss of expression of *MSH2*. Individuals with Lynch Syndrome are at high risk of colorectal cancer, can develop malignancies of the endometrium, ovary, stomach, small bowel, hepatobiliary system and brain and will inevitably continue to develop malignancies. The role of patient autonomy, consent and assent is complex and multifactorial, especially in chronically ill adolescents. The patient's level of cognitive development and ability to understand the risks and benefits of a given decision should be considered.

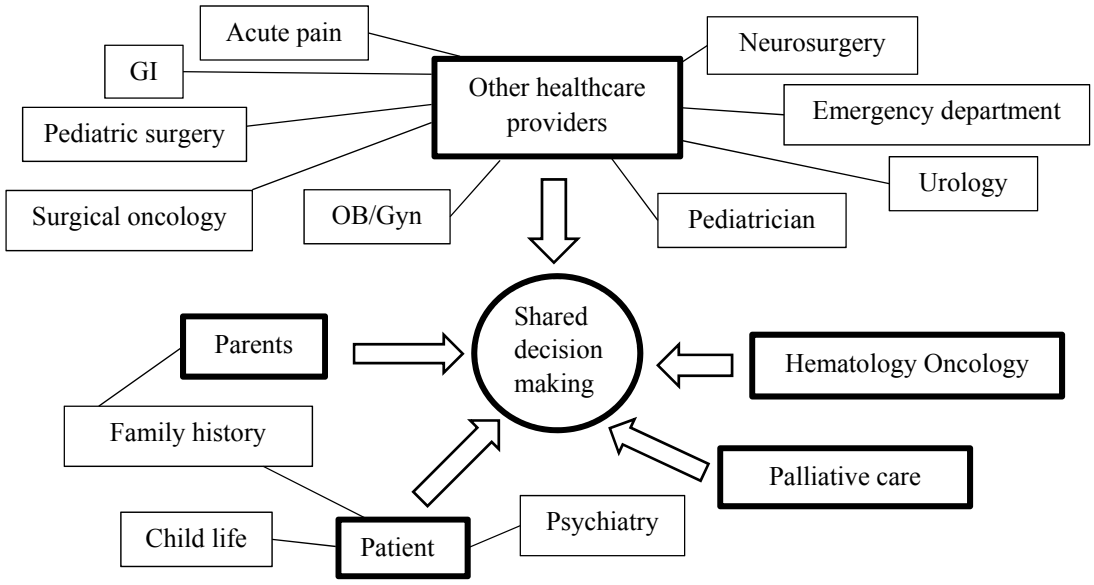
Objectives:

- Understand the role of patient autonomy, consent, and assent in adolescent cancer
- Discuss what happens if patient's decisions conflict with recommended treatment plans
- Recognize the challenges of shared decision making
- Understand the importance of early involvement with palliative care teams

Case Description: SM is a 19 year old woman with biallelic Lynch Syndrome, diagnosed at 14. Since diagnosis, she has had glioblastoma multiforme, transitional cell carcinoma of the bladder, endometrial cancer, recurrent colon adenocarcinoma, and recurrent ovarian carcinoma. SM fully understands her diagnosis and knows she will develop new malignancies. Despite this knowledge, she has declined hysterectomy (due to desire to preserve the ability to carry a pregnancy) and colectomy and ileostomy although it would eliminate future recurrence of colon carcinoma. Palliative care has helped balance SM's goals with recommended treatments to optimize her quality of life (Figure 1).

Conclusion: Treatment discussions are very difficult in patients with poor prognosis and high morbidity. The ethical and emotional ramifications are immense, and adolescent patients carry a high physical and emotional burden. Shared decision making can help balance developing adolescent autonomy with parental desire to protect their children. Palliative care assists with these difficult discussions to align patient, parent and clinician goals for best outcomes.

Figure 1.



ABSTRACT 18.

BIOMARKERS IN FEBRILE NEUTROPENIA

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Background: Febrile neutropenia is a significant cause of morbidity and mortality in pediatric cancer patients. Currently, there are no standardized approaches to risk stratifying these patients and many patients undergo lengthy hospitalizations and exposure to many broad-spectrum antibiotics. Stratifying this population based on clinical and laboratory values would allow for a more streamlined approach to management.

Objective: C-reactive protein (CRP), Procalcitonin (PCT) and lactic acid (LA), in conjunction with clinical presentation, were evaluated to determine their usefulness as a biomarker panel to predict bacteremia in febrile neutropenic pediatric cancer patients

Design:
The study population included pediatric cancer patients on therapy who developed fever while neutropenic (ANC<500/cumm). Control groups were: afebrile neutropenic patients, non-febrile, non-neutropenic patients, and febrile non-neutropenic patients. Clinical data such as diagnosis, treatment regimen, and culture results were also collected. Data was analyzed using SPSS, to determine how these biomarkers correlated with adverse outcomes.

Results: Data was collected on 35 patients, with 114 febrile episodes and 18 positive blood cultures (prevalence 16%). Sample was 43% female and 57% male, with a mean age of 12 years. All three markers demonstrated good sensitivity for bacteremia (CRP 100%, CI: 63.06 -100; PCT 87.50%, CI: 47.35-99.68; LA 100%, CI 63.06-100), with a trend toward higher procalcitonin values (mean of 38.85 ng/mL and median of 11.57 ng/mL) in patients with Gram negative bacteremia, although the sample was not large enough to determine statistical significance. Combined, elevations in these 3 markers have a sensitivity of 87.5% (CI: 47.35-99.68), and negative predictive value of 96.67% (CI: 81.88-99.47). However, all of these values may be influenced by the relatively low prevalence of positive blood cultures in this population.

Conclusions: Normal levels of CRP, procalcitonin, and lactic acid appear to be good negative predictors fro bacteremia, both individually and when combined. In particular, elevation in procalcitonin may help to determine likelihood of Gram negative bacteremia. In the future, when combined with clinical features, these may enable us to risk stratify patients in this population. Our future goal is to use these markers and identified clinical features to develop streamlined treatment algorithms for the management of febrile neutropenia.

ABSTRACT 19.

CASE REPORT: UNEXPECTED FINDINGS WHEN AN X-LINKED DISORDER IS ADDED TO NEWBORN SCREENING

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Background: X-linked Adrenoleukodystrophy (ALD) affects primarily males and results in myelin degeneration and adrenal complications caused by *ABCD1* gene mutations responsible for degradation of very long chain fatty acids (VLCFAs). Klinefelter Syndrome (KS) is the most common chromosome aneuploidy in males (47,XXY), and is rarely reported to occur with X-linked disorders.

Case: A full-term Hispanic newborn male product of uneventful pregnancy was found to have an abnormal newborn screen positive for ALD, showing heterozygosity for a deletion mutation (c.4_5delinsCCCCGGCCCT), and 2 polymorphic variants (c.7336>C and c.*86>C). Heterozygosity of *ABCD1* warranted chromosome analysis; and his 47,XXY karyotype was consistent with KS. Infant was breastfeeding without complications, and VLCFAs were only mildly elevated, similar to levels seen in females heterozygous for *ABCD1* mutation rather than markedly elevated levels in XY males. At 22 months, his neurologic and endocrine indices remain normal.

Discussion: DNA sequence analysis and chromosome studies of our patient indicated two X chromosomes - normal and variant. His mother had the same two variant X chromosomes indicating a meiotic error of maternal origin. In female somatic cells and in KS individuals, one X chromosome is transcriptionally inactivated to equalize dosage of maternal and paternal X-encoded genes (lyonization). Mild elevations of VLCFAs may demonstrate preferred inactivation of the X chromosome carrying the *ABCD1* mutation. An extra unaffected X chromosome in X-linked ALD seems to have protective effect against the cerebral and earlier-onset ALD forms seen in XY males.

Conclusion: We describe the case of X-linked Adrenoleukodystrophy in an infant with Klinefelter Syndrome. An unexpected second diagnosis may be uncovered as X-linked disorders are added to newborn screens; when this occurs, karyotyping and genetic counseling will need to be incorporated into the protocol. In this case, the expected clinical outcome for ALD is expected to be similar to carrier females.

ABSTRACT 20.

ASSESSING MATERNAL KNOWLEDGE ABOUT SAFE SLEEP PRACTICES WITHIN 36 HOURS FOLLOWING DELIVERY

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Background: Sudden infant death syndrome (SIDS) remains the 4th leading cause of infant mortality (2014) in the U.S. despite the "Back to Sleep Campaign". According to the CDC reports (2017) approximately 3,700 infant's deaths are sleep related. There is limited information about prenatal maternal education on the AAP recommendations on infant Safe Sleep Practices (SSP).

Objective: To assess maternal learning, knowledge and planned compliance of SSP following delivery at Stony Brook Children's.

Design: Cross sectional study regarding maternal knowledge about SSP was administered to new mothers within 36 hours of birth. Demographic data and knowledge of SSP were collected: sleeping position; environment; bed sharing; pacifier use; and infant bundling/overheating. Exclusion criteria: Maternal age <18; substance use; adoption; newborn illness; or congenital abnormalities. Data were analyzed using SPSS 2013 version 22.0 and evaluated at the level of $p<0.05$ (two –tailed).

Results: A total of 57/158 mothers participated in the survey 88% (50/57) reported self-education about SSP. Level of maternal education did not correlate with having increased knowledge of SSP. There was no significant difference between age groups or level of education on the protective effect of pacifiers to decrease SIDS (Table 1). Analysis of the survey identified significance with maternal age and knowledge of bundling/overheating (Age <25; p 0.002). Questions regarding SSP were answered correctly: infants should sleep on their backs, alone, in a crib (100%); and with no bumpers or extra objects placed in the crib (91%).

Conclusion/Discussion: The survey demonstrated high levels of knowledge regarding the ABC's Campaign (Alone, on the Back and in a Crib). Additional areas of SSP knowledge deficits identified were: pacifier use, bundling and potential for newborn overheating. Limitations of this study are the small sample size. Follow up studies are need to evaluate maternal SSP education and translation into best practices in the home.

Table 1. Parental SSP Knowledge Questions

Correct vs. Not Correct			p value	Demographics		
Safest to sleep on the back "ABC"	100%	57/57	NS	Age < 25 years	24/57	42%
Safest to sleep in the crib in parent's room	100%	57/57	NS	Age ≥25 years	33/57	58%
Pacifiers protect against SIDS	33.3%	19/57	0.016*	High School or less	8/57	14%
Plan on using a pacifiers	66.6%	38/57	0.033*	College	49/57	86%
Plan to have Nothing in crib	91%	52/57	NS	Status Single	20/57	35%
Bundling infant	85%	48/57	0.001*	Status Married	37/57	65%
Planned use sleep sac or swaddling blanket	70%	40/57	0.003*	Primi-gravida	29/57	51%
Identified any barriers to practice SSP	0.0%	57/57	NS	Multi-gravida	28/57	48%
Knowledge of the term Sudden Infant Death (SIDS)	93%	53/57	NS			

ABSTRACT 21.

NEWBORN SCREENING QUALITY IMPROVEMENT PROJECT

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Background: The New York Newborn Screening (NBS) Program is designed to detect 58 different life-threatening or life-long conditions. Pediatricians are responsible for obtaining and reviewing the results of NBS, notifying families, and providing appropriate referrals. However, there is no national data of NBS documentation and our outpatient model did not have a process for checking NBS documentation.

Objective: To examine and improve the review and documentation process of NBS at SBC over a 1 year intervention period, and therefore enhance patient care delivery.

Design: We used quality improvement design of PDSA (Plan, Do, Study, Act) cycles from January 2016- January 2017. We 1st retrospectively reviewed 60 consecutive charts of infants 2 weeks to 4 months old seen for well check visit at SBC and assess baseline NBS documentation. Our 1st intervention (February 2016), included educating attending and resident physicians about NBS documentation within the Problems/Diagnosis section of the chart using two ICD-10 codes; 120 charts were reviewed 3 months later to assess improvement. The 2nd intervention (May 2016), consisted of a workflow system change in which nurses and ancillary staff entered NBS results (Figure 1), and 120 charts were reviewed 2 months later to assess improvement. Finally, to assess sustainability, in December 2016, 120 charts were reviewed.

Results: Before 2016 at SBC only 30% (19/60) of NBS were documented. Our 1st intervention led to an increase in NBS documentation to 60% (72/120), followed by a further increase to 70% (83/120) after 2nd intervention. Six months post intervention, NBS documentation exceeded goal at 78% (93/120).

Conclusion: After two PDSA cycles, a standardized process for documentation has increased NBS documentation rates at SBC. With further educational reinforcement we expect to optimize the documentation of NBS results and serve as a model process for other institutions.

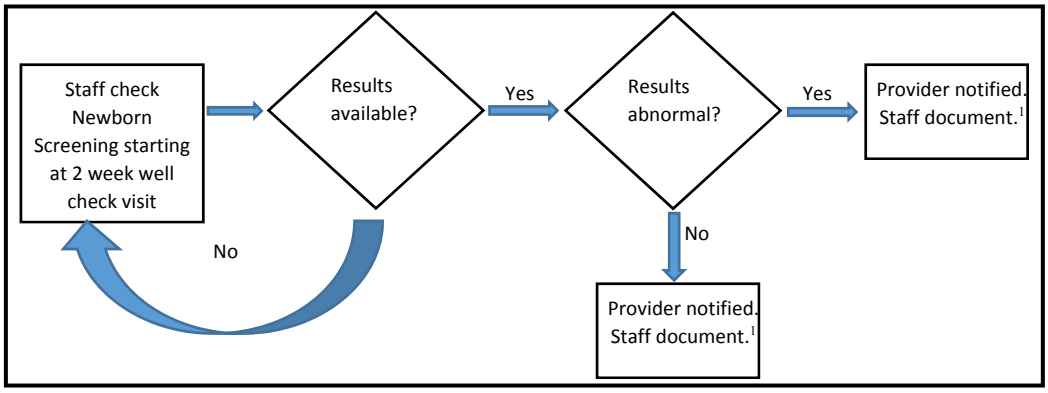

FIGURE 1.
[1] "Abnormal findings on newborn screening" ICD10 code: P09 or "Newborn screening tests negative" ICD10 code: Z13.9

ABSTRACT 22.

HOW ARE WE DOING WITH PEDIATRIC RESIDENT RESEARCH?

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Background: Residency Programs require pediatric residents (PR) to complete research projects (ResP) before their graduation. However, as compared to Pediatric Fellows (PF), PR have limited research experience and protected time dedicated to do it. Mentors (MT) also have limited time/funding and various experience in mentoring. It is unclear what ResP are undertaken, and what outcomes are achieved.

Objective: To describe pediatric research program experience and characterize type/quality of projects and examine the role of MT academic rank.

Methods: We contacted all MT, searched internal abstract booklets and PubMed/Ovid databases and analyzed the data of pediatric research program at Stony Brook Children's from 04/2014-04/2017.

Results: During the study period; 47 PR completed 48, and 18 PF completed 21 ResP. 36.2% (PR) and 22.2% (PF) ResP were observational/epidemiological studies, 6.4% (PR) and 0% (PF) secondary analyses of large data sets, 19.2% (PR) and 27.8% (PF) quality improvement (QI), 21.3% (PR) and 0% (PF) survey design, and 8.5% (PR) and 33.3% (PF) basic science, p=0.017. Of all ResP; 10% (PR) and 8.3% (PF) were presented at regional and 70% (PR) and 75% (PF) at national meetings, p=0.9. However, only 20.6% (PR) were submitted for publication and 11.7% were published, as compared to PF; 72.7% submitted, 36.4% published, p=0.005. MT faculty consisted of 20.3% Professors (Prof), 45.3% Associate Prof, and 32.8% Assistant Prof. We found no association between MT academic rank and project outcomes (Table 1).

Conclusions: Scholarly work of PR primarily focused on clinical research using observational/epidemiological research, and survey design. PF had significant advantage for basic science research, and project publication over PR. MT academic rank did not influence ResP presentation or publication outcome. We are now examining the existing barriers and attitudes so that we can enhance relationship of PR/MT and improve PR quality of research as measured by publication rates.

Table 1. Relationship between mentors and pediatric residents (PR) and fellows (PF) research projects (ResP, n=69) outcomes

Academic rank	Mentor for PR (n=45)	Mentor for PF (n=18)	p-value[t]	ResP Presented at regional/national meetings (n=34)	p-value	ResP Submitted or Published (n=14)	p-value[t]
Assistant Professor	15	6		13		4	
Associate Professor	23	6	0.4	16	0.07	7	0.19
Professor	7	6		5		3	

[t]Fisher's exact test

ABSTRACT 23.

USING QUALITY IMPROVEMENT METHODS TO PREVENT CLOSTRIDIUM DIFFICILE INFECTIONS IN PEDIATRIC HEMATOLOGY/ONCOLOGY PATIENTS

Quiana Pollock MD, Pooja Rathi DO, Amanda Fortuna QMP, Christy Beneri DO, Cliff Roggemann Custodial Services, Rosemary Mahan PNP, Denise Martorana RN, Barbara Kranz CIC, Eric Spitzer MD, Ken Okorn RT, Grace Propper NP QMP, Rafael Acal Jimenez RN, Katherine Morales RN, and Devina Prakash MD

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Background: *Clostridium difficile* (*C. difficile*) is spread via fecal oral route and is the leading cause of hospital-associated diarrhea in U.S. Patient risk factors for *C. difficile* infection (CDI) include antimicrobial exposure, hospitalization, immunocompromised or chronic health conditions, immunosuppressive and use of proton pump inhibitors. External risk factors include contact with health care workers, contaminated environments or direct contact with a CDI patient; many of these are unavoidable in Pediatric Hematology/Oncology (PHO) patients. At Stony Brook Children's Hospital (SBCH), the rate for CDIs for PHO patients prior to this initiative was 48.6/10,000 patient days.

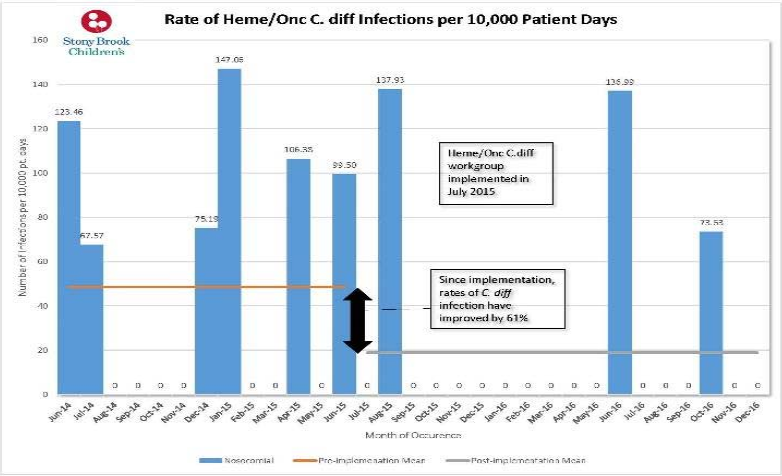
Aim: To identify and remediate the causes of CDI in PHO patients at SBCH.

Methods: For this quality improvement initiative (QI) a multidisciplinary team was assembled with representation from PHO, Infectious Diseases, Infection Control, Microbiology, Nurse Practitioners, House Staff, Respiratory Therapists, Hospital Custodial Staff (HCS) and QI. We measured baseline and post intervention CDI rates on the PHO unit. We used educational materials to inform staff about CDI and assessed pre and post intervention CDI knowledge. We also monitored appropriate test ordering and use of Personal Protective Equipment (PPE) and handwashing. We observed cleaning practices of the hospital custodial staff using standardized check lists. We performed bioburden tests of patient areas.

Results: Since implementation of initiative, rates of CDI have decreased by 61% in PHO patients (p-value 0.11) (Figure 1). The post-educational questionnaire data shows some improvement in knowledge scores. We saw significant bioburden on certain toys and high touch areas in patient rooms

Conclusions: Our project led to a decrease in *C. difficile* rates among our patients though not statistically significant is clinically significant. We plan to continue educational efforts in order to further improve rates and we anticipate a Children's Hospital-wide initiative. Bioburden data will be helpful tool to evaluate cleaning practices.

Figure 1.



ABSTRACT 24.

ROLE OF CHILD LIFE SPECIALISTS IN PEDIATRIC PALLIATIVE CARE

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Background: Each year more than 500,000 children in USA cope with life threatening conditions. Many are hospitalized for long periods for curative treatment or for end of life care. Child life specialists help children and their families navigate the emotionally and physically demanding process of coping with hospitalization. They use their knowledge to provide physical and psychological support during the palliative process. Play therapy, expression through art, magic and music therapy promote effective reduction in anxiety and provide emotional support in the last days of a child with terminal illness.

Case: A 14 year old boy suffering from progressive ependymoma with hydrocephalus was admitted with worsening respiratory distress and bulbar dysfunction with multiorgan failure. He was depressed and had very poor coping skills. The Child life specialist introduced a magician who visited him daily. The primary aim of bringing magic was to improve his quality of life by relieving symptoms of pain, agitation, increase relaxation, and offset depression. Perhaps magic allowed him to believe that impossible things can be achieved and subsequently provided him a subconscious feeling of hope for the future. It became a source of comfort for the patient and family and helped him to preserve dignity and ameliorate suffering. After he died, the family expressed gratitude and summarized that this relationship helped them to accept the death. It also helped Child life to build legacy and provide footprints for future work.

Conclusion: Child life services provide opportunities to engage in normal play and recreational activities that promote growth, development, and feelings of success and fulfillment. They also promote the role of parents and other family members as full partners in the health care team. As our current health care system grows, we would need Child life specialists to be the core members of the Pediatric Palliative Care.

ABSTRACT 25.

DISCHARGE BREASTMILK FEEDING RATES IN ASYMPTOMATIC TERM NEWBORNS ADMITTED TO THE NEONATAL INTENSIVE CARE UNIT FOR MATERNAL CHORIOAMNIONITIS

Miry Shim, DO, Sara Yang, MS-2 (Stony Brook University School of Medicine), Catherine Messina, PhD (Department of Family, Population and Preventive Medicine, Stony Brook University Hospital), Jonathan P. Mintzer, MD (Department of Neonatal-Perinatal Medicine, Stony Brook Children's Hospital)

Background: NICU admission affects exclusive breastmilk (BM) feeding rates. Among asymptomatic term neonates admitted to the NICU for maternal chorioamnionitis, we hypothesized that prolonged (>48 h) antibiotic exposure is associated with reduced discharge exclusive BM feeding rates compared to 48 h antibiotic courses.

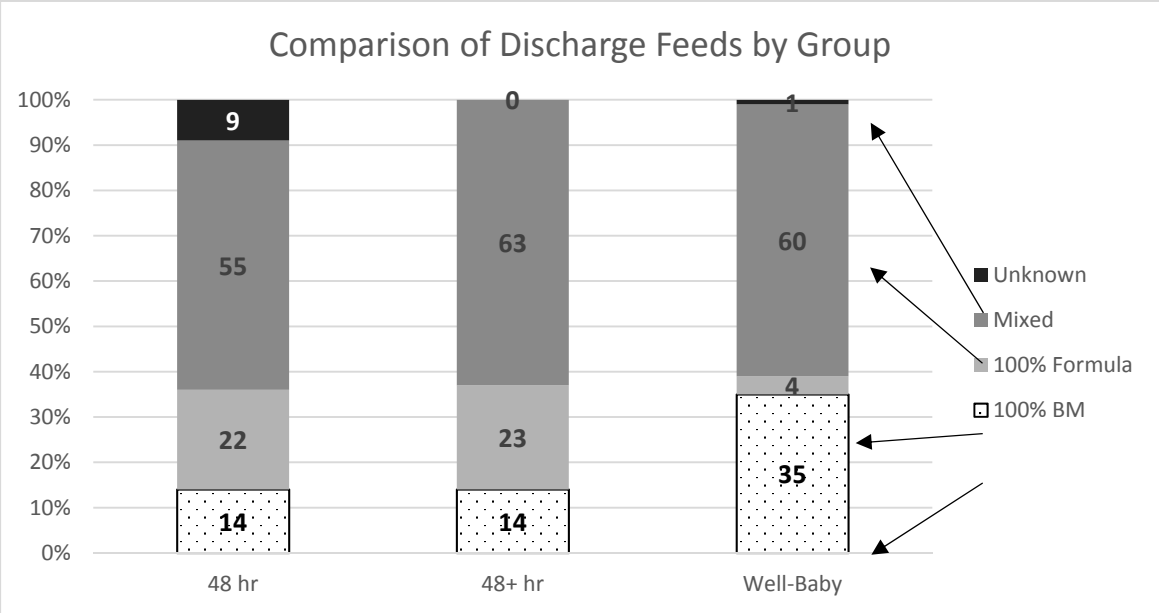
Objective: To compare discharge BM feeding rates among asymptomatic term newborns receiving 48 h vs. >48 h antibiotics in the NICU and a cohort of well-baby nursery (WBN) newborns.

Design: This retrospective chart review included asymptomatic term neonates admitted to the NICU due to maternal chorioamnionitis between Jan, 2012 and Dec, 2015. A comparison group of term WBN neonates were additionally studied. Demographic, birth, feeding, and lactation consultant (LC) visit data were analyzed in univariate and multivariate models.

Results: Among 272 NICU neonates, 237 received 48 h antibiotics vs. 35 who received > 48 h antibiotics; a cohort of 428 WBN neonates was studied for comparison. Among NICU newborns, 48 h vs. >48 h antibiotics was not associated with altered discharge exclusive BM feeding (14% vs. 14%; p = NS). Exclusive BM feeding at discharge was seen in 14% of NICU vs. 35% of WBN neonates ($p < 0.01$) (Figure 1). Among all babies, WBN admission ($p < 0.001$), vaginal delivery ($p = 0.05$), older maternal age ($p < 0.001$), lower parity ($p = 0.001$), higher birth gestational age ($p = 0.02$), and more LC visits ($p = 0.001$) were associated with increased discharge BM feeding.

Conclusions: NICU admission for maternal chorioamnionitis was associated with reduced discharge BM feeding in asymptomatic term neonates, but prolonged antibiotic exposure was not. We speculate that demographic variables, such as maternal age and parity, may aid in focusing lactation consultant efforts to potentially improve exclusive BM feeding rates at discharge.

Figure 1.



ABSTRACT 26.

COMBINED SIMULTANEOUS ARGININE CLONIDINE STIMULATION TEST: TIMING OF PEAK GROWTH HORMONE (GH) CONCENTRATION AND CORRELATION WITH CLINICAL INDICES OF GH STATUS

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Background: Conventional testing for growth hormone deficiency (GHD) utilizes two sequential stimulation tests each lasting 2.5 hours. Our institution uses a combined simultaneous stimulation test requiring 150 minutes.

Objective: The primary aim of this study is to see if it is possible to truncate the test. A second aim is to assess the outcome of the test with clinical correlates of GH status.

Design: Charts of subjects who underwent a combined simultaneous arginine clonidine stimulation test between January 1, 2007, and August 31, 2016, were reviewed.

Results: Charts of 211 subjects were reviewed. One hundred and thirty three of 205 children passed the growth hormone stimulation test defined as at least one GH level $\geq$ 10ng/ml. Five of 6 adolescents who had the stimulation test after completion of growth hormone treatment passed the test defined as at least one GH level $\geq$ 5ng/ml. Among children who passed the test, 88.4% reached peak GH by 90 minutes, and 2.2% of the subjects had a passing peak GH level only after 120 minutes.

After controlling for age and excluding children $\geq$ 15 years of age, at which time growth has ceased in many, there was a weak but significant correlation between baseline growth velocity and peak GH level ($r=0.204$; $p=0.036$). A weak but significant correlation was also found between serum insulin like growth factor-1 z-score and peak GH level ($r=0.17$; $p=0.01$). A trend towards an inverse correlation between peak GH level and change in growth velocity pre and post GH was seen in those treated with GH ($n=38$, $r= -0.28$; $p=0.07$).

Conclusions: If the combined simultaneous arginine clonidine test is shortened to 120 minutes, only 2.2% of normal responders would be missed. Since the combined simultaneous stimulation test spares patients the inconvenience of sequential testing, misclassification of 2.2% of normal responders is acceptable. The combined arginine clonidine stimulation test correlates weakly with clinical indices of GH status.

ABSTRACT 27.

HEPATIC PORTAL VENOUS GAS IN A PATIENT WITH HYPERTROPHIC PYLORIC STENOSIS

Sherin Daniel MD[1], Denease Francis MD[1], Michelle Tobin MD[1], Richard Scriven MD[2], Anupama Chawla MD[1]

Introduction: Hepatic portal venous gas is the presence of gas within the portal vein and its branches. It was initially described in 1955 as a radiographic sign associated with increased mortality in infants with necrotizing enterocolitis (NEC). Its presence is associated with multiple diseases which may be benign or potentially devastating requiring immediate diagnosis and management.

Case Presentation: 4-week-old male presented with one week history of multiple episodes of non-bloody, non-bilious projectile emesis occurring frequently. Physical exam was significant for olive shaped mass in the mid upper abdomen. Bloodwork showed evidence of hyponatremia, hypokalemia and hypochloremia. Initial imaging with AUS and AXR was significant for portal venous gas but did not meet radiographic criteria for pyloric stenosis. Given the AUS/AXR findings patient was admitted with concern of bowel ischemia. Emesis persisted with multiple subsequent imaging remaining inconclusive for pyloric stenosis. He underwent upper endoscopy which showed a narrowed, hypertrophic pylorus. Afterwards, he had a pyloromyotomy with resolution of his emesis.

Discussion: Hepatic portal venous gas (HPVG) is a rare and usually incidental finding in the setting of hypertrophic pyloric stenosis (HPS). The presence of HPVG on imaging was previously thought to be ominous sign warranting urgent intervention however, with the improved sensitivity of imaging including ultrasound, it is being found in an increasing number of benign conditions. The exact pathophysiology of HPVG remains unclear however, multiple theories have been proposed including that it occurs due to portal venous microbe derived gas production or the migration of intestinal luminal air to the portal system. In HPS, hepatic portal venous gas is usually a transient process and resolves within days of gastric decompression.

ABSTRACT 28.

THE EFFECT OF PROTON PUMP INHIBITOR THERAPY ON THE INFANT FECAL MICROBIOME

Denease Francis MD, Grace Gathungu MD, Anupama Chawla MD

Background: Gastroesophageal reflux disease (GERD) is defined as reflux producing bothersome symptoms. Patients with GERD who fail dietary measures are placed on anti-reflux therapy. There is increasing evidence that alterations in the gastric pH may affect overall health. In one study, premature infants treated with H-2 antagonists had a decrease in diversity of their fecal microbiota.

Objective: To determine the effect of proton pump inhibitors on composition of fecal microbiota in infants.

Design: A case controlled study was performed among patients between 0.5 to 6 months old. Subjects were on PPI therapy for at least 4 weeks prior to inclusion. However, controls as young as 2 weeks were included. Patients were excluded if they had anatomical gastrointestinal disorders, were on antimicrobials within 30 days of enrollment, or if parents were unable to give informed consent. Stool was collected and DNA extracted using Zymo Research Fecal DNA Mini Prep kit. DNA was submitted for sequencing. Amplification of the V3-V4 regions of the bacterial 16S ribosomal RNA (rRNA) genes was performed. Sequences were sorted by sample barcodes and classified using a bacteria reference database. The 16s rRNA sequences were grouped into operational taxonomic units (OTUs) representing identified bacterial species.

Results: The overall microbiome composition of infants with reflux on PPI therapy did not differ significantly from controls ($p=0.98$). Each taxon [genus] was analyzed for differences in relative abundance between cases and controls. Findings revealed that controls had increased abundance of proteobacteria enterobacter ($p=0.04$) and proteobacteria B38 ($p=0.03$). Conversely, the infants on PPI therapy had greater abundances of firmicutes RS-D42 ($p=0.05$) and firmicutes granulicatella ($p=0.04$). There was no statistically significant difference in overall microbiome composition by mode of birth ($p=0.22$). There was however, a statistically significant difference by age in months ($p=0.00075$).

Conclusions: Our data suggest that acid suppression may impact the diversity of the microbiome in infants however; our sample size needs to be expanded.

ABSTRACT 29.

NASAL INTERMITTENT MANDATORY VENTILATION (NIMV) VERSUS NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE (NCPAP0 IN STABLE PRETERM INFANTS: DOES NIMV PROVIDE IMPROVED VENTILATION AND CARDIORESPIRATORY STABILITY?

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Department of Pediatrics, Division of Neonatology

Background: NIMV is a frequently used mode of respiratory support in preterm neonates. No previous studies have determined optimal NIMV settings in the very low birth weight (VLBW) infant population.

Objective: Determine the NIMV settings which will provide improved ventilation and cardiorespiratory stability using transcutaneous CO2 (TcCO2) monitoring.

Design: To validate TcCO2 monitoring, we first performed a correlation study between serum PCO2 and TcCO2 (SenTec AG, Switzerland) in VLBW infants with an umbilical arterial catheter. For the remainder of the study, VLBW infants were included, if requiring NCPAP or NIMV, with FiO2 $\leq$35%, and on caffeine. Infants were excluded if FiO2 >35%, with signs of clinical sepsis, hemodynamic instability, or major congenital anomalies. Infants were exposed to NIMV with varying inspiratory pressures (PIP) above PEEP and inspiratory times (Ti), while holding all other ventilator parameters constant. Patients were then randomized to alternating one hour study periods using CPAP and NIMV. Our primary outcome was time-weighted (TW) TcCO2.

Results: There was a positive correlation between TcCO2 and PCO2 ($R^2 = 0.83$, 70 paired measures, 20 VLBWs, GA: 26.6 ± 2.2 weeks, BW: 921 ± 296g). Preliminary results from a Bland Altman indicate that TcCO2 readings are generally higher than PCO2 (mean difference of 2.68). Ninety-two percent of the differences are within 2 SDs of the mean. Thirty-two stable preterm infants were included to assess the effects of PIP and Ti on TcCO2 (GA: 28.6 ± 2.0 weeks, BW: 1100 ± 249g). Optimal NIMV settings varied per patient and TW TcCO2 did not vary significantly with adjusted settings. There was no difference in TW TcC02, oxygenation, respiratory rates and heart rates during the study periods.

Conclusion: TcCO2 can be useful in estimating PCO2 in the VLBW population.
Although short-term use of varying NIMV settings did not demonstrate improvement in TcCO2 monitoring when compared to NCPAP, optimal settings with long-term use and the effects on ventilation and cardiorespiratory stability remain to be determined.