University Hospitals

Rainbow Babies & Children's

53rd Annual Resident Science Day

Thursday, June 8, 2023
Wolstein Auditorium
8:30 a.m. – 4:30 p.m.

Moderators:

- Jonathan Moses, MD
- Kenneth Remy, MD, MHSC, MSCI, FCCM
- Sarah Ronis, MD, PhD

Supported by the
Department of Pediatrics
Division of Pediatric Education

Welcome from the Department Chair

Resident Science Day 2023

It is with pride and pleasure that I welcome you to the 53rd Annual Rainbow Babies and Children's Hospital Resident Science Day. Science Day was the brainchild of Dr. Avroy Fanaroff, who coordinated and oversaw the event for decades; it has become one of our most honored traditions at RB&C. Science Day reflects the very core and essence of our culture, as our trainees – under the mentorship and guidance of faculty members – engage in the pursuit of new knowledge and share their discoveries with the Rainbow community. In many cases, their discoveries are shared well beyond the confines of our institution at regional and national meetings.

As is uniformly the case, Rainbow residents have produced outstanding scholarly works which span the spectrum from clinical investigation to educational interventions, quality improvement, and beyond. Trainees and faculty mentors are to be congratulated for their outstanding efforts, for it is only through a diligent and committed investment of thought and time that projects of this caliber reach fruition.

Science Day presents a wonderful opportunity to congratulate graduating residents, all of whom have accomplished so very much during the last few years. It has truly been our privilege as faculty members to help contribute to the career advancement and knowledge of our residents. As trainees depart for the next phases of their careers, we have full faith and confidence that all will be successful in their chosen path and will always remain a part of the Rainbow family.

Special thanks to Patti DePompei, President of UH Rainbow Babies & Children's Hospital, and to the Rainbow Babies & Children's Foundation for their support of our academic mission. We are also grateful to the moderators and judges for the day's presentations: Drs. Jonathan Moses, Kenneth Remy, and Sarah Ronis.

Many thanks to Sindhoosha Malay and Nori Minich for providing statistical support for our residents. Thanks also to Carla DiNunzio, Laura DiNunzio, Mandy Neudecker, Jessica Williger, and the Chief Residents – Matthew "Zach" Dawson, Debra Rosenbaum, Rachel Welch, and Alissa Zeglin – for coordinating the day's activities. Finally, we would be remiss if we did not recognize the superb leadership of the Rainbow Center for Education – Drs. Michael Dell, Keith Ponitz, Ross Myers, Leslie Dingeldein, Ingrid Anderson, and Nathan Stehouwer.

Congratulations, once again, to our residents for their many accomplishments, not the least of which include their outstanding contributions to Science Day.

Best wishes to everyone!

Marlene R. Miller, MD, MSc
Pediatrician-in-Chief, University Hospitals
Chair, Department of Pediatrics

Welcome from the Pediatric Residency Program

53rd Annual Resident Science Day
June 8, 2023

We are delighted to welcome you to our 53rd Annual Rainbow Babies and Children's Science Day, which showcases the scholarly work of our pediatric residents. Our 2023 Science Day highlights a broad spectrum of outstanding scholarly work, including basic, clinical, and translational science; educational scholarship; and quality improvement projects. Each of our resident presenters—along with their faculty mentors--should be congratulated on their efforts! We celebrate the wonderful academic work that they have produced. A number of our resident presenters have shared their work at national and international meetings and through scholarly publications. This demonstrates the innovation and drive of our future pediatricians and pediatric subspecialists, as well as the high level of support our faculty and administration have for the scholarly mission of our residency program.

Science Day is also an opportunity to recognize and congratulate our graduating residents. For each of us involved in education at Rainbow, this time of year brings a true sense of pride as we celebrate the significant accomplishments of our trainees, and wish them well as they prepare to launch new chapters in their lives. We feel some sadness as members of our Rainbow family depart, but we look forward to watching their careers unfold and the important difference they will make in the lives of the children and families they will serve. We know that these wonderful pediatricians and pediatric subspecialists will always be part of our Rainbow family.

We would like to recognize a number of individuals who make our annual Science Day event a success. A sincere thank you goes to Dr. Marlene Miller, Chair of the Department of Pediatrics; Ms. Patti DePompei, President of Rainbow Babies & Children's Hospital; Dr. Michael Dell, Vice-Chair of Pediatric Education; and Dr. Anna Maria Hibbs, Vice-Chair of Research, for their outstanding leadership and support for our academic mission. We would like to express our heartfelt gratitude to our 2023 Science Day moderators: Drs. Jonathan Moses, Kenneth Remy, and Sarah Ronis. Our residents would not be able to perform such outstanding scholarly work without the support of faculty mentors, all of whom are greatly appreciated. We also would like to recognize and thank Sindoosha Malay and Nori Minich, who provide invaluable statistical expertise and support for our trainees. Finally, a special thanks to Carla DiNunzio, Laura DiNunzio, and Jessica Williger for organizing the day and keeping everything running smoothly behind the scenes. Without their support, Science Day would not be possible.

Congratulations to our residents on their many accomplishments!

Ross E. Myers, MD
Associate Director, Pediatric Residency Program
Professor of Pediatrics, Case Western Reserve University School of Medicine

Department of Pediatrics
Residents 2022-2023

PL-1 Rebecca Audette, Ashley Augustine, Kati Baillie, Virginia Busby, Elisabeth Cahill, Emily Certo, Jefferson Chandler, Shradha-Sonia Chhabria*, Adrianne Cornette, Amy Dadisman, Gates Failing*, Kaushik Ganesh, Barbara Garza Ornelas, Sara Greene, Miranda Gregori, Rebecca Healy, Brandon Hoff***, Collin Huth, Suhib Jamal, Emily Kain, Elisabeth Kamano**, Harshita Kumar, Monica Larson*, Anisha Lobo, Priya Mohan, Nisha Nanavaty, Karishma Palvadi, Diana Ponitz, Emily Qin, Kendyl Schreiber, Miriam Stats, Gwendolyn Thomas*, Carolyn Vekstein

PL-2 Sathya Areti*, Aviva Beleck, Melody Bellora, Saya Bery, Raktima Datta, Shanna Dorcin, Savannah Fotheringham, Ana Gonzalez-Herrera, Krysta Walker, Hanan Haydar, Eleanora Hicks, Adriana Hoffman, Alexa Jordahl, Courtney McCall, Bridgette McCormick, Taylor McDaniel, Shrushti Mehta, Joseph Park, Sarah Redmond*, David Ritzenthaler*, Carlos Ronquillo, Noor Saeed, Nehaly Patel, Christina Shrefler, Garrett Simkins, Benjamin Smith, Samantha Smith, Emma Strode, Rebecca Sturgis, Shwetha Sudhakar*, Natalie Vajda, Rachel VanCoillie***, Emily Watson**, Meagan Zulfer

PL-3 Tanya Abraham, Sofia Bertoloni Meli*, Kammeron Brissett, Mackenzie Cater*, Stephanie Fabry, Hannah Forte, Kendall Franz*, Gabriel Frato, Ashley French, Abigail Gibbs, Lekha Grandhi, Laurel Green, Haley Haskett, Daniel Himelstein, Jaisree Iyer, Adrianna Jackson, Tanya Khan, Amy Kim, Collin Kramer, Sara Manetta, Alyssa Melber, Ryan Mifflin, Sarah Miller, Daniel Mohan, Ryan O'Sullivan, Hannah Spellman, Meenal Thadasina, Matthew Tran, Louise Sawaya*, Zhuo Yang, Sydney Zierden

PL-4 Tolulope Ifabiyi*, Angeline Sawaya*, Michelle Sergi***, Lauren Shurtleff*

Chiefs Matthew Zach Dawson, Debra Rosenbaum, Rachel Welch, Alissa Zeglin*

*Medicine/Pediatrics **Pediatrics/Neurology ***Pediatrics/Genetics

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Rainbow Babies & Children's

53rd Annual Resident Science Day
Thursday, June 8, 2023

8:30 a.m. **Introduction and Welcome**

PRESENTATIONS

Moderators: Jonathan Moses, MD; Kenneth Remy, MD; Sarah Ronis, MD

10:45 a.m.	**False-Positive Rate of Acute Kidney Injury in Children with Diabetic Ketoacidosis: an Appeal for Change in Routine Creatinine Testing Practices** *Jaisree Ramachandran Iyer, MD; Sarah Hatab Chaaban, MD*	**8**
11:00 a.m.	**Social Factors and Injury Experience among Premature and Full-term Children in an Academic Pediatric Practice** *Tanya Khan, MD; Sara Manetta, MD; Sarah Ronis, MD, PhD; Sydney Zierden, MD*	**9**
11:15 a.m.	**Continuity and Quality of Person-centered Primary Care** *Ashley French, MD; Sarah Ronis, MD*	**10**
11:30 a.m.	**Pediatric Trainee's Comfort and Knowledge with Starting and Managing Selective-Serotonin Re-uptake Inhibitors for Pediatric Depression** *Stephanie Fabry, MD; Alyssa Melber, MD; Eva Johnson, MD; Mary Gabriel, MD*	**11**
11:45 a.m.	**Improving Transitions of Healthcare for Young Adults in Internal Medicine Clinic** *Tolulope Ifabiyi, MD; Angeline Sawaya, MD; Lauren Shurtleff, MD; Justin Rondinelli, MD; Laura Schapiro, MD*	**12**
12:00 p.m.	**Association between SEEK Positivity and Incidence and Timing of Behavioral Health Concerns in Children** *Tina Yang, MD; Sarah Miller, MD; Kimberly Burkhart, PhD; Alissa Huth-Bocks, PhD; Sarah Ronis, MD, PhD*	**13**
12:15 p.m.	**Lunch**	
1:00 p.m.	**Endoscopic and Clinical Outcomes for Pediatric Patients with Crohn's Disease Treated with Infliximab in the First Year of Therapy** *Daniel Himelstein, MD; Marco-Jose Rivero, MS2; Sarah DeLozier, PhD; Satish E. Viswanath, PhD; Thomas J. Sferra, MD; Jonathan Moses, MD*	**14**
1:15 p.m.	**Evaluation of Biomarkers for Endothelial Activation and Hemolysis to Predict Sickle Cell Disease Morbidity** *Tolulope Ifabiyi, MD; Keith McCrae, MD; Amma Owusu-Ansah, MD; Kenneth Remy, MD, MHSc, MSCI, FCCM*	**15**
1:30 p.m.	**Influence of Weather on Sickle Cell Disease Vaso-Occlusive Episodes and Acute Chest Syndrome: A Nationwide Sample Analysis** *Ana Gonzalez Herrera, MD; Neha Desai, MD; Amma Owusu-Ansah, MD; Sanjay Ahuja MD*	**16**

A Retrospective Cohort Study of Differences between the Presenting Features and Evaluations of Pediatric Patients with Multi Inflammatory Syndrome- Children vs. Kawasaki's Disease

Meagan Zulfer, MD; Ryan O'Sullivan, MD; Thomas Graf, MD; Sindoosha Malay, MPH, PharmD; Nori Minich, MS; Allayne Stephans, MD

Background: Distinguishing between multisystem inflammatory disease in children (MIS-C) and Kawasaki Disease (KD) can be challenging since these conditions share similar clinical features. Few studies have looked at the differences in clinical features between these two diagnoses during the COVID19 pandemic.

Objectives: The primary aim of this study is to compare baseline characteristics, presenting features, and diagnostic testing in patients who received a final diagnosis of MIS-C vs. KD.

Methods: This was a multicenter retrospective cohort study of pediatric patients aged 6 months to 18 years who presented to the ED between March 31st, 2020, and February 1st, 2022, and received a final discharge diagnosis of MIS-C or KD. Patient demographics, presenting features, laboratory results, and other clinical characteristics were recorded.

Results: Of the 343 patients who met inclusion criteria, 293 received a discharge diagnosis of MIS-C and 50 had a discharge diagnosis of KD. Patients with MIS-C were older at presentation 9.0 years (IQR 5.0 – 12.0) vs. 2 years (IQR 1.0 – 5.5) and more likely to be male (65.5% vs. 46.0%, p= .008) Patients with KD were more likely to present with the 5 major diagnostic criteria for KD (mucosal membrane changes, conjunctival injection, rash, erythema/ edema of hands and feet, and unilateral lymphadenopathy > 1.5 cm.) Patients with MIS-C were more likely to present with one or more of headache, sore throat, abdominal pain, nausea, vomiting and/or diarrhea. Patient with MIS-C underwent more frequent laboratory testing and the median values for ferritin, brain natriuretic protein, absolute lymphocyte count, and platelet count were more abnormal in patients with MIS-C. Similarly, electrocardiogram (ECG) results were more likely to be abnormal in patients with MIS-C (49.4% vs. 19.4%, p=.001.) The results of Echocardiogram were equally likely to be abnormal in both patients with MIS-C and KD (49.8% vs. 40.0%, p = .200.)

Conclusions: MIS-C patients display differences in clinical and laboratory features when compared to KD. Identification of differences and similarities between the presentation of MIS-C and other inflammatory syndromes of childhood such as KD can aide clinicians in making timely diagnoses and deciding on appropriate treatments.

The Impact of COVID-19 on Pediatric Psychiatric and Behavioral Admissions to Inpatient Units: A Retrospective Review

Natalie Vajda, MD, MPH; Savannah Fotheringham, MD; Kendall Franz, MD; Amy Kim, MD; Lindsay Zaremba, MD; Allayne Stephans, MD, FAAP

Background: The COVID-19 pandemic led to widespread school closings which limited social interactions for children and adolescents. Studies early in the pandemic showed a decrease in the number of psychiatric and behavioral admissions. However, the trend in these admissions later in the pandemic has not been adequately studied.

Objectives: To compare the frequency and severity of pediatric psychiatric and behavioral admissions to a tertiary care center before and after the start of the COVID-19 pandemic.

Methods: A retrospective chart review was done of pediatric patients presenting to the emergency department at a tertiary care center in Ohio between March 1st 2019 and November 29th 2021 with psychiatric or behavioral concerns. Patients with complex medical needs and those with unrelated medical conditions were excluded. Baseline demographics and characteristics were stratified pre and post pandemic. Trends in frequency and severity of hospital admissions were compared over time by the type of admission (psychiatric or behavioral) and the severity of the admission (ED only, admitted, ICU care.)

Results: Of the 341 patients meeting admission criteria, 46.3% (158) were seen pre pandemic and 53.6% (183) post pandemic. Median age was 15.3 years (IQR 13.1-17.0), 61.6% were female, 21.7% had a gender or sexual identity other than cisgender/heterosexual, 65.3% received public insurance, and 48.1% were admitted. Of those admitted, 86.5% were seen for psychiatric reasons and 13.5% were seen for behavioral concerns. There was a statistically significant difference in in-person school attendance (82.8% vs. 34.6% $p < .001$.) There was no statistical difference in extracurricular participation, readmissions, long-term harm, or ICU use between groups. Number of admissions per month declined early in the pandemic but returned to pre-pandemic levels later in 2020.

Conclusions: Trends in psychiatric and behavioral admissions declined early in the pandemic but returned to pre pandemic levels by the end of the first year. No significant difference in the severity of admissions or long term harm was observed.

A Retrospective Study
Implementation and Evaluation of a Screening Program Regarding Food Insecurity in a Pediatric Emergency Department

Kammeron Brissett, MD; Lekha Grandhi, MD; Lauren L'Hommedieu, MD; Adrianna Jackson, MD; Emma Strode, DO

Background: About 12.5% of U.S. households with children are food insecure according to the USDA. Cleveland, Ohio is one of the poorest big cities in the US where more than 1 in 5 children live in poverty. At our outpatient center, 37% of families report being food insecure. While universal screening for food insecurity in outpatient settings can aid in connecting patients with appropriate resources, food insecurity for families is dynamic and not always captured at routine visits. Screening for food insecurity in other healthcare settings may identify families in need of aid who might otherwise be missed.

Objectives: The aim of this study was to determine whether screening for food insecurity in a Pediatric Emergency Department (PED) would be both feasible for staff and acceptable to those presenting for acute concerns.

Methods: Cross-sectional descriptive study of parents of low-acuity pediatric patients visiting our PED from 03/1/2022 through 12/9/2022. Interested parents were provided a QR code directing them to the study database in REDCap, where they self-reviewed the study information and, if consenting to participate, self-completed an 11-item survey that included household demographics, the 2 question Hunger Vital Sign™, and for those who desired follow-up, preferred contact information. Those who screened positive were asked whether they wanted a referral placed to the health systems' food-as-medicine program.

Results: Study information was provided to 100 families, among whom 95 consented to participate. Of these, 2 did not complete the survey. On average, 58% of children were female, 73% identified by their caregivers as Black/non-Hispanic, and were on average 6 years old at time of visit. Parents reported an average of 4 members in their household, 27% (25/91) reported living in zip codes where >30% of the population live below the federal poverty level. Of those screened, 62% (57/91) indicated food insecurity, and 96% (55/57) of those screening positive stated that they would like information regarding resources. However, 21% (19/91) declined to provide sufficient demographic information for the team to make the formal referral. Only 5 reported that they had already been referred to the system's food-as-medicine program.

Conclusions: The topic of food insecurity was of high interest to families presenting to our PED with low-acuity concerns. Among this population, food insecurity was more common than expected based on rates from primary care settings in our hospital. Parent knowledge of system resources was poor but interest in referrals was strong. Our data affirmed that patients with food insecurity may not receive the resources that they need at their primary care visits. It is important to implement programs aimed at identifying these higher risk patients in all healthcare settings to ensure these patients are getting the resources that they need.

Evaluating the Impact of Screening Labs for Behavioral and Psychiatric Admissions on Patient Management

Kendall Franz, MD; Amy Kim, MD; Savannah Fotheringham, MD; Natalie Vajda, MD; Lindsay Zaremba, MD; Allayne Stephans, MD

Background: Screening tests are commonly sent at time of admission for inpatient psychiatric treatment. Few studies have examined whether or not this testing identifies organic causes for psychiatric conditions or influences management. Routine laboratory testing may add additional costs to hospitalization and may also lead to unnecessary evaluation.

Objectives: To measure the frequency of routine diagnostic testing for patients presenting with psychiatric complaints and to determine whether this testing influences patient management.

Methods: Retrospective chart review of emergency department encounters was done for patients ages 5 to 18 years seen at a tertiary care center for psychiatric and behavioral concerns from March 1, 2019 to November 29, 2021. Patients with complex medical needs and patients who underwent treatment for an unrelated medical condition were excluded. For each patient we identified whether diagnostic testing contributed to the final diagnosis. We distinguished contributory results from false-positive results.

Results: Of 341 patients who met inclusion criteria, 70.4% underwent diagnostic testing. Median age was 15.3 years (IQR 13.1-17.0), 65.3% received public insurance, 48.1% were admitted. Of the patients admitted, 86.5% were for psychiatric concerns and 13.5% were for behavioral concerns. The most common laboratory test was urine drug screen (64.5%), and 51.2% of females underwent urine pregnancy testing. Of the diagnostic tests sent, 18.6% contributed to a change in management. Vitamin D deficiency was the most commonly identified abnormality. No pregnancies were identified. When excluding vitamin D in patients with diagnostic testing sent for routine screening purposes only, abnormal lab values affected patient management in <1% of cases.

Conclusions: Diagnostic testing for patients admitted with psychiatric or behavioral concerns is low-yield and rarely contributes to a change in management.

Cost-effectiveness of Risk Assessing Asymptomatic Patients with Ventricular Pre-excitation

Matthew Tran, MD; Manav Midha; Mark Votruba, PhD; Christopher Snyder, MD

Background: Patients with ventricular pre-excitation (VPE) can experience rapid conduction down accessory pathways during atrial fibrillation (AFib), resulting in ventricular fibrillation.

Objectives: To evaluate a cost-effective strategy that risk-assesses VPE patients through exercise stress test (EST)- transesophageal electrophysiology study (TEEPS)- transvenous electrophysiology study (TVEPS) until risk is determined (Group I) compared to immediate TVEPS (Group II).

Methods: Meta-analysis from published results on ESTs, results of TEEPS at our institution (12-21) on risk-stratification of VPE patients. Cost-effectiveness analysis was performed using a decision-tree model (TreeAge Pro 2022) comparing Group I to Group II. Cost data was extracted from Centers for Medicare & Medicaid (CMS). Low-risk ESTs were defined as sudden loss of VPE without return. Risk on TEEPS is defined as the shortest pre-excited RR interval (SPERRI) during AFib $\leq$ 250msec. TEEPS was performed if risk couldn't be determined on EST. If TEEPS induced AFib with SPERRI > 250msec, no further testing was required. TVEPS was performed if TEEPS did not induce AFib, SPERRI $\leq$ 250msec, or the patient developed supraventricular tachycardia.

Results: Of patients that underwent EST, 22% (174/784) were deemed low-risk; of patients who underwent TEEPS, 83% (30/36) were considered low-risk. The stepwise approach of Group I had an expected cost of $378.82 versus $692.25 for Group II, with an average savings for CMS of $313.43 per patient. In deterministic sensitivity analysis, this approach remains cost-effective as long as TEEPS efficacy rate is >25.0%.

Conclusions: Risk-assessing VPE patients through stepwise EST-TEEPS-TVEPS is more cost-effective than immediate TVEPS.

Development and Evaluation of a Curriculum to Teach Pediatric Residents How to Give High Quality Feedback

Hannah Spellman, MD; Kathryn Miller, MD; Leslie Dingeldein, MD

Background: Feedback is a critical component of medical education. In the literature, high quality feedback is defined as feedback that is "specific, timely, suggestive of a behavior to repeat or improve, and includes a plan for improvement." High quality feedback promotes learning, growth, and learner resilience. Pediatric residents give feedback to medical students based on direct observation of skills and behaviors. Rainbow Babies and Children's Hospital pediatric residency does not have a curriculum intended to teach residents how to give high quality feedback to medical students, even though it is an expected part of their job.

Objectives: To assess the effectiveness of an educational intervention designed to teach pediatric residents how to give high quality feedback.

Methods: This was a mixed qualitative and quantitative survey design. Based on a targeted needs assessment, a 45-minute educational intervention was developed that defined high quality feedback, outlined various literature-based strategies for giving high quality feedback with limited time, and allowed opportunity to "role play" feedback scenarios based on specific examples. Surveys were sent out to residents immediately prior to, and 3 months following, the educational intervention. The results of the surveys before and after the intervention were compared using descriptive statistics.

Results: The pre-survey response rate 16% and the 3-month-post-survey response rate was 15%, with only 3 of the post-survey respondents identifying that they had attended the educational intervention. On the pre-survey, 70% of respondents reported believing it is their responsibility to give feedback. Of the respondents, 36% were able to correctly identify all components of high quality feedback prior to the educational intervention. 62% of respondents reported "often" giving high quality feedback, and 38% of respondents reported "sometimes" giving high quality feedback. No respondents reported always giving high quality feedback. On all surveys, respondents reported time limitations as the greatest barrier to providing feedback.

Conclusions: Less than 50% of Pediatric residents were initially able to identify components of high quality feedback, even when they believe it is their responsibility to give feedback. Time limitation was the most significant barrier to giving feedback reported by residents in this study. No conclusions were able to be drawn comparing the frequency of high quality feedback given before and after the educational intervention as only 3 post-survey respondents had attended the intervention. The study was limited by the low response rate.

Child Abuse Training for Pediatric Residents: A Simulated Approach to Fill an Educational Need

Hannah Forte, MD; Ingrid Anderson, MD; Anne Bacevice, MD

Background: Understanding how to care for victims of child abuse is a foundational skill for all pediatricians. This is especially true for those working in pediatric emergency departments, where cases of physical abuse are often first identified. While numerous studies of pediatric residents have demonstrated significant desire for increased child abuse education and training opportunities, few validated curricula or clinical exercises currently exist. When faced with similar educational needs, the field of disaster preparedness medicine successfully utilized tabletop simulations to improve resident physician knowledge and confidence in handling high-stakes, low-frequency events.

Objectives: To assess the feasibility of using tabletop simulations to improve pediatric residents' knowledge and confidence in managing pediatric physical abuse patients.

Methods: This pilot study involved pediatric residents who voluntarily participated in one-on-one child abuse tabletop simulations outside of clinical educational requirements. Three simulation sessions were conducted over the course of the academic year, each spaced 3 months apart. Pre- and post-simulation surveys were administered to assess participants' medical knowledge surrounding child abuse management in a pediatric emergency department, knowledge of institutional evidence-based guidelines, and confidence in caring for victims of child abuse.

Results: 17 residents from both pediatric and internal medicine – pediatric residencies were recruited; 16 residents completed the first tabletop simulation; 14 residents completed the second tabletop simulation. In both sessions the majority of participants reported wanting more education on the topic, while all agreed that the tabletop exercise is an effective education tool for managing child abuse. In addition, participants demonstrated statistically significant improvements in confidence regarding their ability to handle physical child abuse cases after the first and second simulations (p values 0.002, and 0.025, respectively). While formal statistical analysis is pending, participant knowledge did not improve based on the percentage of correct medical answers recorded throughout the simulations.

Conclusions: It is feasible to utilize tabletop simulations to provide resident education on a complex topic. This low-fidelity, low-cost simulation significantly improved residents' confidence on the topic of child abuse. However, an overconfidence bias may be present, given the lack of concomitant improvement in knowledge. This reinforces the ongoing need to optimize education on the subject matter in this simulation model. A separate study has trialed the same simulation in small groups, which was well received by participants. Future simulations could feasibly be conducted during resident didactic conferences by using the small group model. The simulation could then be paired with a child abuse lecture, which may further improve overall knowledge in handling physical child abuse in the emergency department.

False-Positive Rate of Acute Kidney Injury in Children with Diabetic Ketoacidosis: an Appeal for Change in Routine Creatinine Testing Practices

Jaisree Ramachandran Iyer, MD; Sarah Hatab Chaaban, MD

Background: Acute kidney injury (AKI) is associated with incident and progressive chronic kidney disease. Recent studies indicate that 20-85% of children admitted with diabetic ketoacidosis (DKA) also develop AKI, underscoring the importance of accurate AKI diagnosis and subsequent follow-up in this population. Traditionally, AKI is diagnosed based on an increase in serum creatinine (Cr) levels, measuring kidney functional change. The measurement of Cr using the Jaffe method is widely used. However, in contrast to the enzymatic methods, Jaffe-based Cr assays are susceptible to biases due to interferences from chromogens such as glucose and ketone bodies, which are notably elevated in DKA. The clinical implications of these interferences during DKA have not yet been investigated.

Objectives: To quantify the rate of false-positive AKI diagnosis using Jaffe-based Cr measurement method.

Methods: We performed a cross-sectional observational study of children presenting with DKA (n=40) between March 2021 and March 2022. Blood samples were serially collected: at DKA presentation, 5-10hrs, 10-24hrs and >24hrs after initiation of insulin therapy, for measurement of Cr, glucose, HCO3- and anion gap (AG) reflective of ketone bodies. Cr was analyzed by (1) enzymatic method (gold standard) and (2) Jaffe method. Absolute errors of Cr by the Jaffe assay and % difference from the enzymatic-measured Cr level were calculated for each sample. Interference was defined as exceeding±15%, which is the error allowed for Cr defined by the College of American Pathologists. The diagnosis of AKI was based on the KDIGO criteria.

Results: Prevalence of AKI in pediatric DKA, as determined by the Jaffe and enzymatic-based Cr measurement methods, was found to be 63% and 30%, respectively. The rate of false-positive AKI diagnosis determined based on the Jaffe-based Cr testing method was 52% (95% confidence interval, 36%-70%). Proportion of samples affected by interferences decreased over time: 33/39 (92%) at DKA presentation, 17/30 (57%) at DKA resolution, and 2/20 (6%) at >10hrs after DKA resolution. The bias in the Jaffe method was significantly larger at lower Cr levels. A significant correlation was found between the positive error by the Jaffe assay and AG. In the multiple linear regression analysis, glucose did not cause additional interference by the Jaffe assay.

Conclusions: The presence of chromogens during DKA can cause interferences with Jaffe assay sufficient to overestimate AKI prevalence by over 100%. The magnitude of interferences are more pronounced at lower Cr values, which is particularly relevant to our pediatric patients. To enhance DKA care and AKI research in the setting of DKA, we strongly recommend standardizing all Cr measurement methods to the enzymatic method. Until then, clinicians caring for children with DKA need to be cognizant of the Cr measurement method used when interpreting changes in Cr levels to better guide fluid therapy.

Social Factors and Injury Experience among Premature and Full-term Children in an Academic Pediatric Practice

Tanya Khan, MD; Sara Manetta, MD; Sarah Ronis, MD, PhD; Sydney Zierden, MD

Background: Premature infants and children are generally regarded as a "high risk" patient population due to the complexity of their care, significant health issues, and numerous follow-up appointments. Their care can act as emotional and financial stressors on families, causing social strife that places these patients at risk for injury and non-accidental trauma. An academic pediatric practice can offer many support programs and social resources and interventions that can potentially act as an indicator for future risk.

Objectives: To compare health-related social risks factors, use of social needs resources, and injury experience among premature and full term infants and children seen in an urban academic pediatric continuity clinic, as well as investigate whether prematurity and/or social risks are associated with injury in this population.

Methods: A retrospective cohort study was performed using a sample population of children presenting for their initial index visit at a comprehensive, academic pediatric practice in an urban location between April 1 to September 30, 2021. The study included children whose guardian completed a social needs screening questionnaire. Chart review included age, race, ethnicity, insurer, gestational age at birth during one-year abstraction period from index visit. Descriptive analyses were used to characterize demographics of this sample population. Wald chi-square, Fisher's Exact, and Kruskal Wallis Rank Sum tests were used to compare children with a history of prematurity versus term children in terms of demographics, social needs, interactions with a resource navigation program, and injury experience in the year.

Results: 779 patients were included, and 87 had a history of prematurity. Premature patients had a median age of 1 year with interquartile range (IQR) of 0 to 3.5 years at the time of their initial index visit and had a median of 2 follow-up encounters with a resource navigation program, versus full-term patients who had a median age of 1 year with IQR of 0 to 6 years (p-value 0.046) and a median of only 1 follow-up encounter (p-value 0.011). There was no significant differences in total number or types of social needs of these patients. 120 patients sustained an injury, accounting for 14.9% (n=13) of the total premature cohort and 15.6% (n=107) of the total full term cohort. The most common injury type in both cohorts was laceration, followed by traumatic brain injuries. While neither prematurity nor social needs were associated with overall injury risk, fractures accounted for 31% (n=4) of injuries in premature patients versus 7.5% (n=8) among full-term patients (p-value 0.026).

Conclusions: While there is no difference in their social burden and needs, patients with a history of prematurity presented at a younger age and had more follow-up with a resource navigation program than their full term counterparts suggesting stronger help-seeking behavior. Patients with history of prematurity sustained statistically more non-skull fractures than full-term patients however their overall injury experience was largely similar to full-term patients.

Continuity and Quality of Person-centered Primary Care

Ashley French, MD; Sarah Ronis, MD

Background: Continuity is an essential part of primary care. Previous research shows that increased continuity of care is associated with improved health outcomes and increased patient and physician satisfaction. Resident and teaching clinics face several challenges when it comes to maintaining continuity for patients and trainees.

Objectives: To better understand how continuity at the UH Rainbow Ahuja Center for Women and Children affects patient follow up, access to care, awareness and usage of available services, and quality of person-centered primary care.

Methods: This was a retrospective cohort study of families who have been seen at the UH Rainbow Ahuja Center for Women and Children and participated in the LINK survey during the fall of 2022. We included those that were recruited from the pediatric practice and excluded those that were recruited from the women's health practice. Participants were then divided into two groups, those that identified a regular primary care physician and those that did not. The following outcomes were compared between groups using Chi-square or Fischer exact analysis: follow up, access to healthcare, quality of person-centered primary care, and awareness and usage of services.

Results: 304 participants were included. Of those, 148 (48%) identified a regular primary care physician and 156 (51%) did not. Those that identified a regular primary care physician tended to be older ($p=0.042$), had more children in the household ($p=0.022$), and were more likely to have completed at least some college ($p=0.013$). There was no difference in follow up between groups. There was also no difference in their ability to access medical care, including healthcare visits, medications, and other services with 85% of participants responding that the Rainbow practice makes it easy for them to get the care that they need. However, a larger percentage of those that have a regular primary care physician felt that their doctor considers all factors that affect their child's health ($p=0.003$), knows their child as a person ($p<0.001$), takes into account knowledge of their family ($p=0.001$), and helps their child stay healthy ($p=0.001$) compared to those that do not have a regular primary care physician. Those identifying a regular primary care physician were also more aware of some services including dieticians ($p=0.055$) and lactation consultants ($p=0.019$).

Conclusions: Continuity in the pediatric practice at the UH Rainbow Ahuja Center for Women and Children is associated with a higher perceived quality of person-centered primary care and awareness of some services available through the center. However, it does not appear to be associated with follow up or ability to access medical care.

Pediatric Trainee's Comfort and Knowledge with Starting and Managing Selective-Serotonin Re-uptake Inhibitors for Pediatric Depression

Stephanie Fabry, MD; Alyssa Melber, MD; Eva Johnson, MD; Mary Gabriel, MD

Background: Depression in pediatric patients is common with a cumulative incidence of 20 % by age 18. Only a small percentage of adolescents are treated by mental health providers, so it often falls to a primary care clinic. Most providers do not feel adequately trained, supported, or compensated to take care of depressed adolescents. Pediatric resident do not get formal training on SSRI management and have limited opportunities for clinical practice.

Objectives: Gauge pediatric and medicine-pediatric residents comfort level with starting, uptitrating, and managing SSRIs for pediatric depression via a survey. The survey also tests resident's knowledge level with side effects of common SSRIs.

Methods: A lecture about pediatric depression and SSRIs was developed for pediatric residents. A pre-survey was sent to all pediatric and medicine-pediatric residents to be completed prior to the lecture. After the 1 hour lecture, a post-survey was distributed to the resident who filled out the pre-survey.

Results: 99 pre-lecture surveys were sent. 57 residents attended lecture. 52 residents filled out the pre-survey; however, 39 residents filled out the post-survey. 13 pre-surveys were excluded from the statistical analysis. Response rate was 68%. The data that was analyzed was resident's comfortability with starting an SSRI, uptitrating an SSRI, and counseling on the risks and benefits. It was statistically different pre and post lecture using a paired t-test. The lecture improved comfortability with SSRI use. Answers from 2 knowledge based questions were compared pre and post lecture which showed a 38 % increase and a 44% increase in the correct answer.

Conclusions: Diagnosing depression and utilizing SSRIs in pediatrics is within the scope of practice for a pediatrician. Pediatric residents do not get formal teaching or practice with starting, uptitrating, and counseling on SSRIs. This study showed that resident comfortability in those domains increased after a 1 hour didactic lecture about depression and SSRIs along with demonstration of improved knowledge about specific SSRIs.

Improving Transitions of Healthcare for Young Adults in Internal Medicine Clinic

Tolulope Ifabiyi, MD; Angeline Sawaya, MD; Lauren Shurtleff, MD; Justin Rondinelli, MD; Laura Schapiro, MD

Background: The transition of care for young adults from pediatricians to adult providers is often challenging for both patients and providers. Providers often do not talk about transitioning care, and patients typically feel underprepared to find a new doctor. Studies have shown that 4.5 million young adults (ages 18-26) cannot identify a primary care doctor, and subsequently this age group is the second most likely to utilize the ED for care. Additionally, young adulthood represents a unique and often challenging time in a patient's life. Mental health is of particular concern; 10% of youth will require short term special mental health services and suicide is the second leading cause of death in this population.

Objectives: To improve the healthcare of young adults transitioning from pediatric to adult providers.

Methods: Internal medicine and medicine-pediatric residents of all post-graduate years underwent a mandatory education session as part of weekly didactic half-day. The session focused on the importance of transition of care for young adults and distributed a note template for social history in young adults. The template was a modified HEADS exam, focusing on the patient's living situation, education and work, drug and alcohol use, sexuality and contraception, and mood symptoms. The education session was done 4 times, once for each unique group of residents on the ambulatory block. Charts were reviewed from Douglas Moore Clinic 8 weeks prior to the intervention and 8 weeks following the intervention. Information about the various aspects of the social history were recorded for wellness visits of patients aged 18-30 years.

Results: 54 unique charts were reviewed for the pre-intervention data collection. 41/54 (76%) of charts included a section on social history. The most common part of the social history included was drug and alcohol use at 37/54 charts (69%). Only 29/54 charts (54%) included information about education and employment, while 25/54 charts (46%) included information about sexuality and contraception. The two least commonly mentioned components of the social history mentioned were living situation at 20/54 charts (37%) and mood symptoms at 11/54 charts (20%). Post-intervention data collection is currently ongoing.

Conclusions: Prior to the intervention, only about three-fourths of young adult visits included any component of the social history. Only 20% of visits included a mention of mood symptoms despite its importance in this age group. Post-interventional analysis is pending.

Association between SEEK Positivity and Incidence and Timing of Behavioral Health Concerns in Children

Tina Yang, MD; Sarah Miller, MD; Kimberly Burkhart, PhD; Alissa Huth-Bocks, PhD; Sarah Ronis, MD, PhD

Background: The Safe Environment for Every Kid (SEEK) is an evidence-based tool developed to screen for risk factors associated with child maltreatment, utilizing findings from the Adverse Childhood Experiences (ACEs) which highlights the link between childhood adversities and long-term harm. Literature has revealed risk factors of child maltreatment to include parental depression, major parental stress, substance abuse, intimate partner violence, food insecurity, and harsh punishment which are the major domains asked on the SEEK screener. While the SEEK screener was designed to identify children at risk for maltreatment, it is unclear the extent to which the SEEK tool may also identify children at risk of other behavioral concerns. Therefore, we aim to investigate the relationship between positive SEEK and report of behavioral concerns.

Objectives: 1) To describe demographic and clinical characteristics of children for whom SEEK screening was completed in a large resident continuity clinic. 2) To determine whether positive SEEK screen is associated with increased documentation of behavioral concerns among children ages 0-6. 3) To assess timing of behavioral concerns relative to timing of SEEK screen completion.

Methods: This study was a retrospective cohort study of patients seen at a pediatric resident clinic between April 1, 2021 and September 30, 2021. We included children aged <6 years at index visit with at least 2 lifetime visits to our resident clinic prior to and including index visit. Our analyzed variables included patient demographics, patient comorbidities, timing of first documentation of behavioral concerns (after, before, or with SEEK screen completion), and SEEK screen content.

Results: We had 623 total children who met inclusion criteria, of which 170 were SEEK positive and 70 had behavioral concerns. The majority of the overall sample were African American children (91.3%). Among children with behavioral concerns, 10% had a co-existing diagnosis of anxiety and 12.9% had ADHD. There was a statistically significant association between positive SEEK screen and behavioral concerns ($p<0.001$), however no association was observed between the timing of first documentation of behavioral concerns and timing of SEEK screen completion ($p=0.226$). Certain SEEK screen domains were more closely associated with behavioral concerns, including major parental stress ($p<0.001$) and food insecurity ($p=0.033$).

Conclusions: Our study concluded that positive SEEK screens are associated with increased documentation of behavioral concerns, however there does not appear to be a temporal relationship between the two. The association exists even after accounting for age as a confounder. Our limitation is small sample size. These results could indicate that it is important to assess for SEEK domain positivity early in a child's life, and if positive, pediatricians should assess for any behavioral concerns as well. Further research is required to determine if addressing domains of concern identified on SEEK screen is associated with improvement in behavioral concerns.

Endoscopic and Clinical Outcomes for Pediatric Patients with Crohn's Disease Treated with Infliximab in the First Year of Therapy

Daniel Himelstein, MD; Marco-Jose Rivero, MS2; Sarah DeLozier, PhD; Satish E. Viswanath, PhD; Thomas J. Sferra, MD; Jonathan Moses, MD

Background: Current "treat-to-target" practices require achievement of endoscopic remission after initiation or change of a medication for pediatric Crohn's Disease Our study assesses the rate of endoscopic remission at one year after initiation of infliximab therapy in pediatric patients with Crohn's disease and examines baseline characteristics, biochemical markers, and clinical disease scores between those in remission and those with active disease.

Objectives: Our primary aim was to assess endoscopic remission at one year after initiation of infliximab therapy in pediatric patients with Crohn's disease.

Methods: Single center retrospective chart review on patients with baseline endoscopy, were treated with infliximab, and had one year follow up endoscopy. Patients were divided into active disease and remission groups based on scoring follow up endoscopy. Biochemical markers and clinical disease activity was assessed at baseline and one year. Trough infliximab drug levels were obtained post-induction and at one year.

Results: Of the 51 patients, endoscopic remission rate was 67%. Fecal calprotectin (FC) and albumin levels were significantly lower at one year for the remission group as compared to the active disease group. Clinical disease scores were not statistically different the two groups at baseline and one year. Post-induction drug levels were numerically lower in patients with active disease at one year.

Conclusions: Two-thirds of the patients achieved endoscopic remission at one year and clinical remission did not correlate with endoscopic remission. FC statistically different at one year between those with active disease and remission. Trough drug levels were numerically different but not statistically significant.

Evaluation of Biomarkers for Endothelial Activation and Hemolysis to Predict Sickle Cell Disease Morbidity

Tolulope Ifabiyi, MD; Keith McCrae, MD; Amma Owusu-Ansah, MD; Kenneth Remy, MD, MHSc, MSCI, FCCM

Background: Patients with sickle cell disease (SCD) are plagued with numerous vascular complications including acute chest syndrome (ACS), avascular necrosis of joints, stroke, and pulmonary embolism. Chronic intravascular hemolysis from the disease lead to a depletion of scavenger proteins haptoglobin and hemopexin, which bind free hemoglobin and heme respectively. Free heme is particularly damaging, causing endothelial activation with increased expression of adhesion molecules and ultimately potentiating inflammation. A gap of knowledge exists with understanding the interplay between heme and adhesive markers that may explain many of the complications in SCD.

Objectives: To evaluate whether biomarkers for hemolysis (haptoglobin, hemopexin, total heme, free heme) as well as biomarkers for endothelial activation (ET-1, sVCAM-1, ICAM-1) are elevated in patients with SCD compared to healthy volunteer controls. Additionally, to determine correlations between biomarkers and hospitalizations for vaso-occlusion episodes (VOE) and ACS in patients with SCD.

Methods: Participants were between the ages of 14-30 with known SCD (HgbSS, HgbSC, HgbSβ° and HgbSβ(+)) from the pediatric and adult hematology clinics at University Hospitals Cleveland Medical Center and Rainbow Babies and Children's. Participants without SCD were also recruited as age matched controls. A single blood draw during a patient's steady state was obtained and hemolysis labs as well as adhesion molecules were measured through ELISA, and a laboratory-based internally derived heme assay. Electronic medical records (EMR) were reviewed for clinical correlates of identified biomarker profiles.

Results: A total of 17 patients were enrolled: 5 control and 12 with SCD (eight with Hgb SS, three with SC, one with Hgb Sβ(+) thalassemia). There were 58.8% of patients age 18 and below; M:F 10:7. There were significantly lower levels of haptoglobin in the HbSS group- mean 58.9 ± 88.4 µg/ml (SEM) vs control 1721.8 ± 470.0 µg/ml (n=8,5; p=0.03), and hemopexin: 124.7 ± 29.9 µg/ml vs control 1064.7 µg/ml (n=7,5; p=0.002). Total and free heme were also significantly elevated in those with HgSS: 50.6 ± 9.9 µM vs control 18.0 ± 4.9 µM (n=8,4; p=0.02) and 12.0 ± 1.3 µM vs control 6.3 ± 0.8 µM (n=8,4; p=0.004) comparisons, respectively. The endothelial and adhesion molecules did not show statistical significance when compared to control, and there were no significant correlations with the number of hospitalizations.

Conclusions: Patients with SCD have significant heme, and near complete deficiency of scavenging proteins (almost undetectable haptoglobin, and extremely low hemopexin). Although minor differences were noted in measures of endothelial activation compared to controls, these studies were underpowered to detect such differences and were only a single time point.

Influence of Weather on Sickle Cell Disease Vaso-Occlusive Episodes and Acute Chest Syndrome: A Nationwide Sample Analysis

Ana Gonzalez Herrera, MD; Neha Desai, MD; Amma Owusu-Ansah, MD; Sanjay Ahuja MD

Background: The clinical manifestations of sickle cell disease (SCD) lead to significant morbidity and healthcare costs. The effect of weather on the incidence of vaso-occlusive episodes (VOE) and acute chest syndrome (ACS) has been studied however with variable observations. Anecdotal observations have led providers to infer that cold weather and sudden changes in temperature trigger VOEs. The aim of our retrospective, nationwide study was to determine the association between weather patterns and pediatric VOE/ACS to identify risk factors and appropriately counsel patients regarding climate influence on SCD.

Objectives: To identify a relationship between weather patterns and incidence of VOE/ACS in pediatric patients

Methods: A retrospective cohort study was conducted. The PHIS database was queried for pediatrics SCD patients evaluated in the emergency department (ED) or admitted for VOE or ACS from the fourth quarter of 2015 to the third quarter of 2022. Patients with type HbSS, HbSC, and HbS-beta thalassemia (plus and zero) SCD were included. The weather data was collected from the NCEI/NOAA database and the weather variables included average temperature, delta or change in temperature, precipitation, wind speed, and snowfall. Descriptive statistics were used to describe demographics, clinical characteristics, and weather information and population average generalized estimating equation analyses were performed to determine the association between the weather predictors and outcomes. The regression results were reported as incidence rate ratios with 95% confidence intervals. A p-value of less than 0.05 was considered statistically significant for the analysis.

Results: Of the total 84,774 encounters included, 86% were diagnosed with VOE and 14% were diagnosed with ACS. Approximately 60% of all patients were admitted to the hospital. Results demonstrated a significant association between each of the three diagnoses (VOE ED visits, VOE admissions, and ACS admissions) with at least one of the weather variables. However, no one weather variable was associated with all three diagnoses. Of those weather factors that were statistically significant, a positive association was observed between VOE admissions, wind speed, and snowfall; and ACS admissions with average temperature and same-day change in temperature.

Conclusions: Our nationwide, retrospective study supports the fact that weather influences the incidence of SCD complications although no one specific variable was noted to be more influential than other. While future, prospective studies are needed to truly assess the incidence of vaso-occlusive episodes and acute chest syndrome in a larger, geographically widespread population, we will continue to counsel our patients to avoid cold weather and dress warmly based on our data, anecdotal evidence, and clinical observations.

Utilization of Peripherally Inserted Central Catheters for Outpatient Parenteral Antibiotics at Rainbow Babies and Children's Hospital

Sydney Zierden, MD; LeAnne Moore, PharmD; Ankita Desai, MD

Background: Peripherally inserted central catheters (PICCs) provide secure vascular access that can be used in both the inpatient and outpatient settings allowing for continuation of parenteral therapies after discharge, and decreasing duration of hospitalization. However, they pose a risk of infection, thromboembolism, and mechanical complications. To minimize these risks, it is imperative to discontinue usage and remove as early as possible when clinically appropriate.

Objectives: To review utilization of PICCs at Rainbow Babies and Children's Hospital for continuation of antibiotic therapy in the outpatient setting and perform a descriptive analysis of PICC line utilization practices.

Methods: This is a retrospective descriptive cohort study of patients admitted to Rainbow Babies and Children's Hospital and discharged with a PICC for home parenteral antibiotic therapy in an 18-month period from June 1, 2021 to December 31, 2022. The patient cohort was obtained from UH Home Care Services and chart review included age, gender, admitting service, diagnosis, culture data, C-reactive protein, white blood cell count, imaging studies, antibiotic and duration of use, duration of PICC use, consultation of the Pediatric Infectious Diseases (ID) service, PICC complications and management of those complications.

Results: 22 patients were included, ranging from 21 days to 18 years old, with 45% (n=10) male and 55% (n=12) female. Half (n=11) were admitted to the general pediatrics service. ID consultation occurred in 82% (n=18) of patients. Of those without ID consultation, 3 were managed by pulmonology and 1 by gastroenterology. Bone and joint infections were the most frequent indication (31%, n=7), then lung (23% n=5), CNS (14%, n=3), and intraabdominal infections (9%, n=2). 86% (n=19) had positive culture data, 5% (n=1) had negative cultures, and 9% (n=2) had no cultures with diagnosis instead based on imaging. Ceftriaxone was used in 45% (n=10), followed by cefepime in 27% (n=6). Antibiotic courses ranged from 14 to 48 days with a mean of 26 days. PICC duration ranged from 8 to 48 days with a mean of 24 days, with 23% (n=5) remaining in place beyond the end of the antibiotic course. A complication occurred in 9% (n=2), 1 with thrombosis requiring readmission, anticoagulation, and PICC replacement, and 1 with an adverse drug reaction requiring readmission and alternative antibiotic use.

Conclusions: Bone or joint infections were the most frequent diagnosis treated with home parenteral therapy via PICC and ceftriaxone was the most common antibiotic prescribed. Mean duration of use was 26 days. The 9% complication rate is consistent with the 8% rate found in a larger study.[1] Future directions include quality improvement initiatives aimed at developing guidelines for utilization of PICCs, transition to oral antibiotics, and involvement of ID to assist in clinical decision making and promotion of antibiotic stewardship efforts.

Congenital Cytomegalovirus Infection Screening in the Newborn Nursery: Areas for Improvement in the Absence of Standardized Guidelines

Tanya Abraham, MD; Nori Minich, BS; Ankita Desai, MD

Background: Cytomegalovirus (CMV) is the most common viral cause of congenital defects in the U.S. with 4.5 to 7 per 1000 live births affected. CMV is the leading non-hereditary cause of sensorineural hearing loss. Early identification of congenital CMV (cCMV) infection allows for optimal antiviral treatment which has been shown to reduce progression of hearing loss and improve neurodevelopmental outcomes. There is varying guidance from expert consensus groups ranging from universal neonatal screening to selective screening based on clinical features. With conflicting data in the literature, many hospitals in the U.S. have no standardized protocol for cCMV screening.

Objectives: This study aims to detail clinical characteristics and outcomes of infants with cCMV in a large tertiary medical center prior to implementation of standardized guidelines.

Methods: This was a retrospective case study of newborns who screened positive for CMV between June 2017-July 2022 at Rainbow Babies & Children's Hospital in Cleveland, Ohio, USA. 1900 newborns less than 21 days old were tested for CMV during this period, and newborns who screened positive for CMV were included (n=18). Clinical characteristics of the patients were described using median and interquartile range for continuous variables and frequency and percentages for categorical variables.

Results: The prevalence rate of cCMV at our center is 9.5 per 1000 live births. Patients had a variety of clinical features associated with cCMV with most common being small for gestational age (n=12), microcephaly (n=9), abnormal neuroimaging findings (n=6), and failed newborn hearing screen (n=4). Of the 12 patients who were SGA, two patients had isolated SGA and neither received treatment. No confirmatory urine tests were performed for positive saliva PCR screens. 61% of patients (n=11) received oral valganciclovir with documented side effects of neutropenia and transaminitis in 44% (n=8) of patients which resolved after treatment completion. 33% of newborns (n=6) had no infectious disease or audiology follow-up documented within our system. Three patients were diagnosed with sensorineural hearing loss after initial failed newborn hearing screen, and only one of these patients received appropriate antiviral treatment. 39% of patients had documented concerns of developmental delay, mostly speech.

Conclusions: Most common clinical features for cCMV included small for gestational age, microcephaly, abnormal neuroimaging, and failed newborn hearing screen. Targeted screening practices in our institution varied by provider with the biggest discrepancy being screening symmetric versus asymmetric SGA. Our center has a prevalence rate slightly above the national average; however, the yield of screening isolated SGA is shown to be low. This study highlights gaps in current cCMV screening at our institution including lack of confirmatory urine CMV testing, and infants lost to follow up. System-level interventions including creation of standardized guidelines and provider education are necessary to create a cost-effective targeted screening process with improved follow-up and outcomes.

Spatiotemporal Expansion of Lyme disease in Ohio between 2009-2022

Hanan Haydar, MD; Ankita Desai, MD

Background: Lyme disease, caused by the bacteria, *Borrelia burgdorferi*, is the most common tick-borne infection in North America, affecting tens of thousands of persons annually. The disease has expanded rapidly through Pennsylvania, Michigan and the southeastern US. Ohio has been considered a non-endemic state by the CDC which has been thought to be due to absence of the disease-transmitting vector, the *Ixodes scapularis* tick. According to the Ohio Department of Health (ODH) website, cases have been increasing over the past 10 years. (ODH website). There were 2,732 cases reported to ODH between 2009 and 2021. A knowledge gap exists regarding the description of the increasing number of human Lyme disease cases in Ohio, the factors that have contributed to this increase in cases and whether the expansion of Lyme disease is uniformly throughout the state or clustered in certain locations of Ohio.

Objectives: To describe the geographic expansion of human Lyme disease between 2009 – 2022 and to identify the demographic and environmental factors contributing to this expansion.

Methods: Lyme data will be provided by ODH and we will perform a cross-sectional retrospective analysis to describe the expansion of human Lyme disease cases at the census block group level and identify variables associated with clustering of cases in Ohio. Outcome variables will include iIncidence of Lyme disease per spatial unit (census tract) and the following, cCovariates: age, (continuous variable), sex, (binary), incidence or count of *Ixodes scapularis* per spatial unit, (continuous), year of diagnosis and population density. (nominal).Baseline demographic data (sex, categorical variable) will be summarized as a percentage. The outcome variable will be graphically portrayed using spatio-temporal mapping. We will evaluate spatial heterogeneity of our dependent variables using Bayesian generalized additive models. These models will be implemented using the brms package in the statistical programming language R which facilitates the construction of Bayesian regression models that are then transferred to the program Stan (mc-stan.org) for sampling of the posterior distribution. Observations, which were the number of Lyme disease cases per census block group, will likely contain many zero values, and therefore we will assume that a zero count could occur for two reasons: either cases occurred but were never recognized or reported, or they were true zero counts. We will evaluate different zero-inflation models to determine the most appropriate for this study (zero-inflation negative binomial model vs. zero-inflation Poisson model).

Results and Conclusion: Pending receipt of data and further analysis and mapping results.

Pilot Study Investigating the Use of a Portable Adult Wrist Cuff for Blood Pressure Monitoring in Neonates

Abigail Gibbs, MD; Melanie Gonzalez, APRN; Lisa Schultz, RN; Emily Joyce, MD

Background: Neonatal hypertension affects up to 3% of infants admitted to the neonatal intensive care unit. More than half of these infants will be prescribed anti-hypertensive medications, requiring close subspecialty follow up. Assessment of blood pressure after discharge is challenging with the primary care setting generally not equipped for infant pressure measurement, infrequent subspecialist visits in less accessible locations, limited home nursing visits, and expensive home blood pressure devices for infants. Validation of an affordable and user-friendly portable blood pressure device for infants will aid in timely outpatient medication adjustments, thus limiting both unnecessary antihypertensive use and undertreated hypertension.

Objectives: To assess the inter-rater reliability and accuracy (as compared to gold standard) of an FDA approved portable adult wrist blood pressure cuff for use in the neonatal population. This is a pilot study toward validation of an affordable and user-friendly home blood pressure measurement device for infants.

Methods: Participants were recruited from the RBC NICU step down unit to participate in blood pressure measurement sessions using both the inpatient gold standard device and the experimental device in a "same arm sequential" method. We included inpatient infants born >29 weeks gestation and corrected >36 weeks gestation, with current weight >2500 grams, no history of vascular pathology or current IV access in the right upper extremity, and no diagnosis of neonatal abstinence syndrome. At each session, blood pressure was measured with the gold standard device by the bedside nurse, then with the experimental device by a constant rater #1, and finally with the experimental device by a variable rater #2, for a total of 3 measurements per session. Patient disposition was also recorded for each blood pressure measurement, in addition to basic demographic information.

Results:
13 patients participated in the study, for a total of 29 data collection sessions. Participants had an average corrected gestational age of 38 weeks 5 days, and average weight of 3205g. For the first objective of inter-rater reliability of the experimental cuff, the mean difference between two raters was not statistically significant (systolic mean difference 2.07 mmHg, p=0.22; diastolic mean difference 0.59 mmHg, p=0.59). For the second objective of device accuracy, systolic blood pressure correlated moderately with gold standard (r=0.48, p=0.008), and diastolic blood pressure correlated poorly with gold standard (r=0.12, p=0.529).

Conclusion: The Generation Guard wrist cuff correlates moderately well with the inpatient gold standard for measurement of systolic blood pressure in infants based on a pilot study, and shows a strong inter-rater reliability. This device may be a promising affordable option for infant home blood pressure monitoring, but more statistical power is needed before the device can be validated for use in this population.

We're Going Bananas: Evaluating Effectiveness and Safety in Banana Purees as an Intervention for Improving Oral Feeding

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Background: Premature infants often experience dysphagia and swallowing difficulty with oral feeding. Several contributing factors include immaturity related to prematurity, chronic illness, prolonged intubation, and delays in introducing oral feeds. To address reflux and dysphagia in pediatrics, feeds are often thickened using products such as cereal, puree, and commercial thickeners. In neonates, there is wide institutional variation in thickener use, likely from a lack of available commercial thickeners due to concern for association with necrotizing enterocolitis. Additionally, traditional thickening products are difficult to blend with breastmilk. Banana purees were instituted as a thickening agent after trialing standard interventions for oropharyngeal dysphagia at our institution in 2015 with anecdotal success.

Objectives: To evaluate safety and feasibility of banana purees as a thickening agent in a cohort of neonatal intensive care unit (NICU) patients with dysphagia.

Methods: A retrospective chart review of 23 NICU patients who received banana purees as an intervention for dysphagia between 2015 and 2022 was performed. Data including patient demographics, growth parameters, oral feeding skills, and respiratory support were collected before and after banana intervention (BI). Results were analyzed using descriptive summary statistics and Wilcoxon signed rank tests to compare two non-normally distributed paired data, before and after banana intervention.

Results: Banana puree was introduced at a median postmenstrual age of 42 weeks in patients with a median gestational age of 30 weeks and birth weight of 1500g. Common reasons for BI were general incoordination, clinical reflux, and oral stimulation. Bananas were successfully used to thicken breastmilk. Prior to BI, only 40% of all enteral intake was through oral feeds. After seven days, there was a statistically significant improvement in the percentage of oral intake from a median of 40 (IQR 7,100) to 100 (29,100), $p<0.04$. Weight gain over the week prior to BI was a median of 23 g/day, which remained stable at 24 g/day 7-14 days after introducing bananas. No infants required feeds to be held due to BI. One patient received increased respiratory support for feeding endurance, however this was not noted to be directly due to BI. Infants received BI for a median of 12.5 days, and 11 infants (48%) were discharged with bananas. Of the 12 patients who were not using bananas at discharge, eight stopped BI after achieving short-term benefit with improved oral intake and no longer required BI at discharge. No patients stopped BI due to perceived adverse effects from bananas.

Conclusions: In this retrospective chart review, banana purees as an intervention for dysphagia in neonates was demonstrated to be safe and feasible. Infants showed significant improvement in the percentage of oral feeds after BI without significantly harming weight gain velocity or respiratory status. Future studies are required to further examine the efficacy and superiority of using banana purees for dysphagia compared to other methods.

Modified Scoring Tool to Predict the Need for Tracheostomy in Infants with Bronchopulmonary Dysplasia

Ryan Mifflin, MD; Nicholas Eastman, MD; Rita Ryan, MD; Monika Bhola, MD

Background: Bronchopulmonary dysplasia (BPD) is a common complication of extreme prematurity. As much as 3.5% of those with severe BPD are ventilator dependent and go on to require a tracheostomy. Studies have shown that timely tracheostomies can optimize the developmental outcomes of this population. However there are no reliable tools that could predict the babies that would need a tracheostomy. We have previously used a scoring tool from Nationwide Children's Hospital but had difficulty accurately scoring the patients due to the complex nature of the tool. This scoring tool also started at a post menstrual age (PMA) of 44 weeks.

Objectives: To evaluate a modified and simplified scoring tool based off one previously used by Nationwide Children's Hospital to determine if we could predict the possibility of a tracheostomy at an earlier PMA of 36 weeks. The hypothesis is that patients who received a tracheostomy will still have significantly higher scores than those who did not receive a tracheostomy using a less extensive list of required information.

Methods: This was a retrospective cohort study via chart review of infants born weighing less than 1500 grams who were admitted to the Rainbow Babies and Children's NICU between 2018 and 2019. Infants were included if they qualified for severe BPD by requiring a respiratory support of at least 2 liters at 36 weeks PMA. Scores on the modified scoring tool were obtained for weight Z-score, need for systemic steroids, change in oxygen need, need for sedation, presence of pulmonary hypertension, use of diuretics, failure of planned or unplanned extubation, type of respiratory support, FiO2 of respiratory support, PEEP if using a ventilator, and presence of upper airway issues.

Results: 75 infants were included in the study, 7 of which received a tracheostomy. 3 infants died, two of which had received a tracheostomy and 1 without. Scores were significantly higher in infants who received a tracheostomy compared to those who did not at 36, 40, and 48 weeks PMA ($p=0.003$, $p=0.0128$, and $p=0.0448$ respectively).

Conclusions: Infants who underwent tracheostomy had significantly higher scores in most time points on this modified scoring tool, as compared to all points on the original scoring tool. Increasing the sample size may be sufficient to overcome this; otherwise, further concordance testing or modifications may be necessary. Regardless, infants with BPD continue to signal the need for possible tracheostomy as early as 36 weeks PMA.

Evaluation of Intravenous Immunoglobulin Administration for Hyperbilirubinemia in Newborn Infants with Hemolytic Disease

Daniel Mohan, MD; Rita Marie Ryan, MD; Hannah Lu; Jaime Marasch, PharmD; Jacquelyn McClary, PharmD; Mary Nock, MD

Background: American Academy of Pediatrics guidelines (2004) recommend the use of intravenous gamma globulin (IVIG) for infants with immune-mediated hemolysis and severe hyperbilirubinemia who are within 2-3 of double-volume exchange transfusion (DVET) level despite use of intensive phototherapy. The randomized trials demonstrating efficacy for IVIG were in direct antiglobulin (Coombs, DAT) positive infants with Rh or ABO hemolytic disease of the newborn. With the AAP recommendation, clinicians have been using IVIG outside of the specific parameters despite the known adverse event of IVIG-induced hemolysis, the hospital cost for a 3 kg infant being $684 and patient charge $3,375, and the potential for significant donor exposure (1,000- 15,000 per does depending on the preparation) In addition, recently the efficacy of IVIG to prevent DVET has been debated.

Objectives: To determine the use of IVIG in a single center NICU over a give-year period with regard to meeting the AAP guidelines.

Design/Methods: Pharmacy records were used to identify all NICU patients who had IVIG ordered in 2018-20. There were 73 patients with orders; 71 actually received IVIG. Twelve babies received IVIG for indications other than immune mediated hemolysis/ hyperbilirubinemia (Figure). The remaining 59 babies had detailed data collection.

Results: The median gestational age was 39 weeks, 53% were male; 78% were black; 47 (78%) were an ABO "set-up" and 11 (19%) had an Rh setup; 42 (71%) were DAT positive. The median age at which phototherapy was started was 7 hours, with median duration 86 hours. Fourteen (24%) of the 59 babies received a 2nd dose of IVIG and 2 had a 3rd dose ordered with one receiving (Table 2). The median dose was 1 g/kg. The median hours of age IVIG was received were 12.6, 40.4 and 79.5 hours for the 1st, 2nd and 3rd doses. The only adverse event noted was hypoglycemia in two babies during the infusion. Of the 59 babies, only 12% had a total serum bilirubin with 3 of exchange level; the median hours between phototherapy started and IVIG ordered was 2.6 hours, mean 7 hours; 66% were on phototherapy for <4 hours prior to IVIG being ordered. We considered meeting the AAP guidelines as having a positive DAT, having a bilirubin with 3 of exchange level, or having had at least four hours of intensive phototherapy prior to the IVIG order and 42% of babies met this criteria. Meeting all criteria for IVIG was rare and only one baby met all three parameters. In particular only 11.9% of the time was the bilirubin level with 3 of the exchange level.

Conclusions: These data suggest our clinicians are often using IVIG outside of the AAP recommendations. We are developing a clinical practice guideline for our unit.

Effects of Stenotrophomonas maltophilia on Lung Function in Cystic Fibrosis

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Background: *Stenotrophomonas maltophilia* is one of most common multidrug-resistant organisms isolated from the respiratory tract of patients with cystic fibrosis (CF), and its prevalence is increasing. There is no recommendation guiding the management of *S. maltophilia* lung infection as it is unclear whether antibiotics against *S. maltophilia* affect outcomes.

Objectives: The objective of this study was to investigate the effects of *S. maltophilia* initial infection on lung function in patients with CF.

Methods: This retrospective single-center study included 152 patients with CF with a first positive respiratory culture for *S. maltophilia* between 2012 and 2022. The clinical data were collected for 1 year before and after *S. maltophilia* initial infection and included respiratory cultures, lung function tests, and modulator use.

Results: At time of initial infection, mean age was 20.03 ± 14.18 years and FEV_1 % predicted was 68.19 ± 25.58. There was no statistical difference in mean FEV_1 % predicted in the year following initial infection (69.46 ± 26.81, P = 0.9426). No difference in FEV_1 % predicted in the year following infection was present between patients that had subsequent negative respiratory cultures for *S. maltophilia* and those that remained positive (P = 0.9300). Additionally, no difference was present between patients that were treated with antibiotics against *S. maltophilia* and those that were not (P = 0.1617). There was no difference in FEV_1 % predicted following infection between patients on CFTR modulators compared to those that were not at the time of infection (P = 0.3320)

Conclusions: In this single-center cohort, *S. maltophilia* initial infection was not associated with lung function decline. Antibiotic therapy, subsequent negative respiratory cultures for *S. maltophilia*, and CFTR modulator use did not affect lung function following initial infection.

Pediatric Resident Comfort with Comfort Care

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Background: Educating residents about end of life (EOL) care is a critical part of pediatric training. Approximately 50,000 children die each year, with more than 500,000 children living with life-threatening diseases annually. Several previous surveys of pediatric residents reveal low levels of self-assessed competency in various EOL care tasks such as pain and symptom management, declaring death, discussing withdrawal of technology, and coping with personal grief. To improve end of life education and communication, five lectures and a 2-hour training session were organized for pediatric residents at Rainbow Babies and Children's Hospital.

Objectives: To assess both end of life topics of interest to pediatric residents and pediatric residents' comfort with end of life care discussions and logistical matters. Comfort will be assessed before and after a five-part lecture series and two-hour training session with the goals of improving overall knowledge and comfort.

Methods: This prospective study assessed pediatric residents' comfort with inpatient end of life discussions and other end of life matters. Surveyed information sought included experiences with end of life care, circumstances of patient deaths, ability and knowledge to perform duties during end of life (i.e. death note, pronouncing a patient), roles during end of life discussions, limitations to participation in end of life care, and short answers explaining what makes the resident comfortable and uncomfortable with difficult conversations.

Results: 73 residents participated in the pre-survey and 17 residents participated in the post-survey. Most residents had little to no experience with end of life care prior to the education series. This lack of experience limited their knowledge and comfort with difficult discussions and tasks. After the series, there was only a modest improvement in comfort.

Conclusions: Due to the anonymity of the surveys, the pre and post-surveys were not matched to evaluate for individual resident improvement. In addition, the post-survey sample size was small. Both led to significant limitations of this study. The results nevertheless suggest that pediatric residents would greatly benefit from more experience with difficult conversations and end of life care. Examples of expanded exposure could include time in a pediatric palliative care or hospice setting with an emphasis on involving residents in real-life situations to expand practice and hands-on care.

Normative Laboratory Value Ranges in Pediatric Patients who Underwent Evaluation for Multi-Inflammatory Syndrome- Children (MIS-C)

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Background: Several months into the COVID19 pandemic a novel condition called MIS-C emerged within the pediatric population and quickly became one of the leading causes of morbidity and mortality in children with a recent history of COVID19 infection. Most patients who presented with fever to pediatric emergency departments (EDs) were evaluated for MIS-C with extensive laboratory testing but many of them ended up with an alternative final diagnosis. Many of these screening labs were markedly abnormal and normative ranges for these labs in common pediatric conditions such as bronchiolitis and dehydration are not well reported in the literature.

Objectives: To report on the normative ranges of screening laboratory values in MISC and alternative diagnoses with similar clinical phenotype.

Methods: This study is a multicenter retrospective cohort study of pediatric patients 6 months to 18 years who were seen in 6 tertiary pediatric EDs between March 31st 2020 and Feb 1st 2022 and underwent laboratory evaluation for MIS-C. Patient demographics and laboratory results were recorded. For each laboratory result we determined the median and range of values and compared these in patients with a diagnosis of MIS-C vs. other conditions. We also reported the spectrum of final diagnoses other than MIS-C along with the laboratory medians and ranges 12 of these 'other' diagnoses.

Results: Of 2,182 patients who underwent chart review, 1320 met inclusion criteria, 22.2% (294) were diagnosed with MIS-C, 77.7% (1,026) received a diagnosis other than MIS-C. The median age was higher in patients with MIS-C 9.0 (IQR 5.0, 12.0) vs. 6.0 (IQR 2.0, 13.0). Patients with MIS-C were more likely to be admitted (98.0 % vs. 71.0%, $p< 0.001$), had longer lengths of stay 5.0 days (IQR 4.0 – 7.0) vs. 3.0 days (IQR 1.7, 5.0), and were more likely to require ICU level care (55% vs. 16%, $p <0.001$). MIS-C patients were also more likely to undergo all types of laboratory testing. The values of laboratory tests were furthest outside of acceptable normative ranges for patients with MIS-C but the ranges of labs in several other conditions were also markedly abnormal. For example, in patients with common viral illnesses the upper range of d-dimer was 30,477 ng/mL (normal < 500 ng/mL). The most common 'other' diagnoses within this cohort were Viral Illness (other than COVID19), Acute COVID, Fever NOS, Pyelonephritis, Kawasaki's and Community Acquired Pneumonia.

Conclusions: Many patients who presented with fever during the COVID19 pandemic underwent laboratory evaluation for MIS-C. Most of these patients received a diagnosis other than MIS-C. Medians and ranges for lab values sent on patients with other final diagnoses were also abnormal. This study provides ranges of these lab values for a spectrum of common pediatric conditions.