RUTGERS

Robert Wood Johnson Medical School

DEPARTMENT OF PEDIATRICS

2023
11th Annual Pediatrics Research Day

Agenda

- **Podium Presentations:**

  8:00 AM – 10:00 AM
  CAB: 3403 - 3404
  125 Paterson Street,
  New Brunswick, NJ 08901

  - **Opening Remarks**
    Lawrence C. Kleinman, MD, MPH, FAAP
    Professor and Vice Chair for Academic Development
    Chief, Division of Population Health, Quality, and Implementation Science (PopQuIS)

- **8:05 AM: Jazmin Garcia:** Simulation Led Assessment of Entrustable Professional Activity (EPA) 8 & 10 for Fourth-Year Medical Students

- **8:20 AM: Melissa Weidner, MD:** Exposure to enterotoxigenic bacteroides fragilis is common in pediatric patients. with inflammatory bowel disease and children seen in pediatric gastroenterology clinics.

- **8:35 AM: Arnold Rabson, MD:** ERK – Signaling regulates human T-cell leukemia virus type 1 RNA stability and gene expression in latently infected CD4 T-cells.

- **8:50 AM: Bethany Hunt:** Factors associated with failure of initial non-invasive respiratory support in late preterm. and term infants and its impact on outcomes.

- **9:05 AM: Erica Levin:** Parents' Perspectives on Strengthening Clinician-Parent Partnerships.

- **9:20 AM: Kristine Schmitz, MD:** Paternal postpartum depression and children's adverse childhood experiences at age 5.

- **9:35 AM: Alan S. Weller, MD, MPH:** SARS-CoV-2 Oral Fluid Antibody Prevalence Among Unvaccinated Children in New Jersey.

- **9:50 AM: Sarah Fadem, PhD:** The MCH-MRN Framework: A Novel Framework to Guide Prioritization and Measurement of Complex Health Interactions Across

- **Poster Presentations:**
  10:00 AM – 12:00 PM

101. **Katherine Briski, MD:** The twin experience and child development: communicative, cognitive, psychomotor, and psychosocial impact.

102. **Gail Burack, PhD:** Developing a tool to support equity research: assessing reliability of the LINK COVID-19 survey to identify indices of medical and non-medical needs, stress, and positive health in People Living with HIV/AIDS during the COVID-19 pandemic.

103. **Myriam Casseus, PhD, MPH, MA:** Trends in characteristics of U.S. children and youth with SARS-CoV-2 Infection and multisystem inflammatory syndrome.

104. **Myriam Casseus, PhD, MPH, MA:** LINK: An expanded instrument for caregiver report to assess key constructs related to children and adolescents infected with SARS-CoV-2.

105. **Caroline Coffield, PhD – Maharaib Syed:** Including young adults with disabilities as standardized patients in practice visits with second-year medical students.

106. **Myrhiam Diarra:** Understanding Parent Motivation for Participating in the Pfizer COVID-19 Vaccine Trial.

107. **Sarah Fadem, PhD:** Disparity in the Reporting of Child Abuse in Clinical Practice: A Scoping Review.

108. **Paulette Forbes, PhD:** Medication adherence among patients with sickle cell disease at one pediatric sickle cell center in New Jersey.

109. **Christina Glytsou, PhD:** Mitophagy promotes resistance to BH3 mimetics in acute myeloid leukemia.

110. **Nathalie Groot:** Characterization of Calcium Signals and Oscillations in Dendritic Cells in vivo in Response to Pathogens.

111. **Daniel B. Horton, MD:** Overview of global real-world data sources for pediatric pharmacoepidemiologic research.

112. **Lawrence C. Kleinman, MD, MPH:** Caregiver-Reported Outcomes of SARS-CoV-2 Infection.

113. **Erica Levin:** Beyond the Diagnosis: Health Promotion and Anticipatory Guidance in the Pre-Clinical Pediatric Medicine Curriculum.

114. **Karen Long-Traynor, PhD:** Feasibility of a peer-to-peer parent mentoring program for parents of children recently diagnosed with cancer.

115. **Sourabh P. Mudakannavar:** Effect of physical fatigue on cognitive ability in multiple sclerosis (MS) patients.

116. **Erini Papas:** Small-for-Gestational-Age and Vocabulary and Achievement Test Scores at Age 9 Among Children Born at Term in a Contemporary U.S. Sample.

117. **Yongkyu Park:** Biomarkers of neurocognitive decline after childhood leukemia treatment.

118. **Chadni Patel:** Investigating the impact of doxorubicin on the blood-brain barrier for chemotherapy-induced cognitive impairment.

119. **Michael Rozylowicz, MBS:** Age and Subject Status (TD vs. At-Risk) Intersensory Integration.

120. **Sruchika Sabu:** Small-for-gestational age and age at menarche in a diverse population-based U.S. sample.

121. **Mariah Jacqueline Scott, MS, MPH:** Students Helping Individuals Facilitate Transition (SHIFT): A sickle cell disease intervention.

122. **Harsh Sharma:** Community-Wide Efforts to Improve COVID-19 Vaccination in Children in the State of New Jersey.

123. **Chi Chang Sung, PhD:** The role of inflammatory cues in intestinal IgA in response to commensals and during oral vaccination.

124. **Balaji Sutharsanam, MD:** Mitochondrial bioenergetics and neurological damage after 1 minute of cardiac arrest and return of spontaneous circulation after resuscitation with RA or 100% Oxygen.

125. **Nila Uthirasamy:** Association between clinician modeling and enhanced home literacy environments among Latino families: A mixed methods investigation of Reach Out and Read implementation.

126. **Margaret Whedon, PhD:** Is Metamemory Impaired in Youth with Neurodevelopmental Disorders?

127. **Margaret Whedon, PhD:** Developmental Changes in Facial Memory and Metamemory.

- ## Keynote Speaker:

12:00 PM – 1:00 PM
CAB: 3403 - 3404
125 Paterson Street,
New Brunswick, NJ 08901

Vadim S. Ten MD, PhD
Professor of Pediatrics
Director, Division of Neonatology
"Neonatal White Matter Injury. A path from bedside to bench and back."

Abstracts

Abstract No.	Author (s)	Title
101.	Chi Chang (Chris) Sung, Gaetan Barbet	The role of inflammatory cues in intestinal IgA in response to commensals and during oral vaccination.
102.	Nathalie Groot, Gaetan Barbet	Characterization of calcium signals and oscillations in dendritic cells in vivo in response to pathogens.
103.	Katherine Briski	The twin experience and child development: communicative, cognitive, psychomotor, and psychosocial Impact.
104.	Myriam Casseus, James M. Cooney, Olivia A. Wackowski	Tobacco use, dependence, and age of initiation among youths with cognitive disability.
105.	Myriam Casseus, Wun Jung Kim, Daniel B Horton	Prevalence and treatment of mental, behavioral, and developmental disorders in children with co-occurring autism spectrum disorder and attention-deficit/hyperactivity disorder: A population-based study.
106.	Caroline Coffield, Ciara Bosch, Megha Shah	Including young adults with disabilities as standardized patients in practice visits with second-year medical students.
107.	Myrhiam Diarra, Simon Li, Patricia Greenberg, Natale Mazzaferro, Maya Ramagopal	Understanding parent motivation for participating in the Pfizer COVID-19 Vaccine Trial.
108.	Kristine Held Schmitz, Sarah Fadem, Paula Lucuara Revelo, Clarissa G. Hoover, Latoshia Rouse Marie Abraham, Milton Kotelchuck, Myriam Casseus, Amanda Ratigan, Casey Lamar, Sandra Moroso-Fela, Lawrence C Kleinman.	Disparity in the reporting of child abuse in clinical practice: A scoping review.
109.	Kchmitz KH, Barach P , Fadem S , Kairys S, Kaelber D, Kleinman LC	The MCH-MRN Framework: A novel framework to guide prioritization and measurement of complex health interactions across the maternal-child life course.
110.	Chinwe Mercy Izegbu, Paulette Forbes, Sharon Anderson, Elizabeth Castro	Medication adherence among patients with sickle cell disease at one pediatric sickle cell center in New Jersey.
111.	Christina Glytsou, Xufeng Chen, Emmanouil Zacharioudakis, Wafa Al-Santli, Hua Zhou, Bettina Nadorp, Soobeom Lee, Audrey Lasry, Michael Andreeff, Evripidis Gavathiotis, Iannis Aifantis	Mitophagy promotes resistance to BH3 mimetics in acute myeloid leukemia.
112.	Ananya Gorrai, Amanda Ratigan, [1]Gail Burack, Sneha Jacob, Patricia N. Whitley-Williams, Roseann Marone, Sunanda Gaur, Lawrence C. Kleinman.[1]	Developing a tool to support equity research: assessing reliability of the LINK COVID-19 survey to identify indices of medical and non-medical needs, stress, and positive health in People Living with HIV/AIDS during the COVID-19 pandemic.

113.	Gerold T. Wharton, Claudia Becker, Dimitri Bennett, Mehmet Burcu, Greta Bushnell, Carmen Ferrajolo, Sigal Kaplan, Ann W. McMahon, Naimisha Movva, Sudha R. Raman, Oliver Scholle, Mina Suh, Jenny W. Sun, Daniel B. Horton.	**Overview of global real world data sources for pediatric pharmacoepidemiologic research.**
114.	Bethany L. Hunt, Amy S. Parikh, Deepak Jain	Factors associated with failure of initial non-invasive respiratory support in late preterm and term infants and its impact on outcomes.
115.	Nila Uthirasamy, Jennifer R. Hemler, Alicja Bator, Keanaan Malke, Daniel Lima, Pamela Ohman Strickland, Usha Ramachandran, Alan Mendelsohn, Benjamin F. Crabtree, Shawna V. Hudson, Thomas I. Mackie, Manuel E. Jimenez	Association between clinician modeling and enhanced home literacy environments among Latino families: A mixed methods investigation of Reach Out and Read implementation.
116.	Kleinman LC, Moroso-Fela S, Li S, Gaur S, Fadem S, Dworetzky B, Ratigan A, Casseus M, Gennaro ML, Auger K, Brady P, Bukulmez H, Hasan U, Hester CM, Kaelber D, Kalyoussef S,1 Kimura Y, Lakhani S, Pace W, Richlin B, Roy JA, Schmitz K, Shelton C, Singh A, Suarez C, Wampler Muskardin T, Wahezi D, Horton D.	Parent (caregiver) reported outcomes of COVID-19 in children and adolescents after at least 90 Days.
117.	Erica R. Levin, Betsey Mathew, Paul Weber, Kristen Coppola, Elizabeth Goodman, Usha Ramachandran	Beyond the diagnosis: health promotion and anticipatory guidance in the pre-clinical pediatric medicine curriculum.
118.	Erica R. Levin, Manuel E. Jimenez, David J. Cordoba, Daniel Lima, Nikki Shearman, David Willis, Deepa Srinivasavaradan, Usha Ramachandran.	Parents' perspectives on strengthening clinician-parent partnerships.
119.	Bozena J. Katic, Jessica Alvitres, Joseph V. Schwab, Charles Li, Manisha Gurumurthy, Reed Magleby , Isaura Otero, Loen Alburquerque, Angelic Fiuza, Celine Molfetta, Arianne Ramos, Monica Siu, Alan S. Weller, Sunanda Gaur, Elsie Roca-Piccini, Uzma Hasan, Cecilia DiPentima, Aspasia Katragkou , Pauline Thomas, Stephen Friedman	SARS-CoV-2 oral fluid antibody prevalence among unvaccinated children in New Jersey.
120.	Karen L Long-Traynor, Katie A Devine, Susan Stephens, Michael Lewis, Peter D. Cole.	Feasibility of a peer-to-peer parent mentoring program for parents of children recently diagnosed with cancer.
121.	Sourabh Prakash Mudakannavar, Elangovan, Mitila, Hsieh, Eileen, Vrindten, Kiera, Bhise, Vikram, Hundal, Jasdeep, Cohen, Evan T.	Effect of physical fatigue on cognitive ability in multiple sclerosis (MS) patients.
122.	Erini D. Papas, Nancy E. Reichman, Hope Corman, Kelly Noonan, Kirsten B. Kuhn, Thomas Hegyi	Small-for-Gestational-Age and vocabulary and achievement test scores at age 9 among children born at term in a contemporary U.S. sample.

123.	Yongkyu Park, Kayla Baker, Peter D. Cole	Biomarkers of neurocognitive decline after childhood leukemia treatment
124.	Chadni Patel, Frank Diglio, Jeremy Willekens, Derek Adler, Yongkyu Park, Peter D. Cole	Investigating genetic susceptibility for chemotherapy-induced cognitive impairment in a juvenile ApoE4 rat model.
125.	Chadni Patel, Jeremy Willekens, Frank Diglio, Yongkyu Park, Peter D. Cole	Investigating the impact of doxorubicin on the blood brain barrier for chemotherapy-induced cognitive impairment.
126.	Chadni Patel, Jeremy Willekens, Frank Diglio, Yongkyu Park, Peter D. Cole	Investigating the impact of doxorubicin on the microbiome in a juvenile rat model.
127.	Lin H-C, Li M-L, Brewer G, Rabson AB	ERK – Signaling regulates human T-cell leukemia virus type 1 RNA stability and gene expression in latently infected CD4 T-cells.
128.	Amanda Ratigan, Daniel Horton, Sunanda Gaur, Simon Li, Benjamin Richlin, Christian Suarez, Uzma Hasan, Aalok Singh, Yukiko Kimura, Dawn Wahezi, Wilson Pace, Patrick Brady, Katherine Auger, Theresa Wampler Muskardin, Sabah Kalyoussef, Christopher Stille, Saquib Lakhani, Hulya Bukulmez, David Kaelber, Beth Dworetzky, Christina Hester, Jason Roy, Matt Hall, Alex Fiks, Jay Berry, Kristine Schmitz, Myriam Casseus, Sarah Fadem, Sandee Moroso, Maria Laura Gennaro, Lawrence Kleinman.	Local inventory of needs and knowledge (LINK) for COVID: An expanded instrument for caregiver reports to assess key constructs related to children and adolescents infected with SARS-CoV-2.
129.	Amanda Ratigan, Matt Hall, Jason Roy, Kathy Augur, Patrick Brady, Myriam Casseus, Alex Fiks, David Kaelber, Lawrence Kleinman, Daniel B. Horton	Trends in characteristics of U.S. children and youth with SARS-CoV-2 infection and multisystem inflammatory syndrome.
130.	Michael Rozylowicz, Mrudula Gattu, Michael Lewis	Age and subject status (TD vs. At-Risk) intercessory integration.
131.	Sruchika Sabu, Hope Corman, Kelly Noonan, Nancy E. Reichman, Kirsten B. Kuhn, Sally Radovick.	Small-for-gestational age and age at menarche in a diverse population-based U.S. sample.
132.	Kristine Schmitz, Manuel E. Jimenez, Hope Corman, Kelly Noonan, Nancy E. Reichman	Paternal postpartum depression and children's adverse childhood experiences at age 5.
133.	Mariah Jacqueline Scott, Adrienne S. Viola, Hanin Rashid, Richard Drachtman, Amanda Kaveney, Ashwin Sridharan, Beth Savage, Elliot Coups, Cristine Delnevo, Jerlym S. Porter, Katie A. Devine.	Students helping individuals facilitate transition (SHIFT): A sickle cell disease intervention.
134.	Harsh Sharma, Jasmine Sandhu, Pragyan Sharma, Usha Ramachandran, Lawrence Kleinman, Sunanda Gaur, Lisa Mikesell, Jennifer Forbes Mullenhard, Lakshmi Nandini Moorth.	Community-wide efforts to improve COVID-19 vaccination in children in the State of New Jersey.

135.	Sutharsanam B, Solevåg A.L, Sosunov S, Solberg R, Niatsetskaya Z, Ten V.	Mitochondrial bioenergetics and neurological damage after 1 minute of cardiac arrest and return of spontaneous circulation after resuscitation with RA or 100% Oxygen.
136.	Melissa Weidner, Shaoguang Wu, Xinqun Wu, Myron Jackson, Courtney Stevens, Victoria Campodonico, Silvia Cohen, Robert Yolken, Maria Oliva-Hemker, Cynthia Sears	Exposure to enterotoxigenic *Bacteroides fragilis* is common in pediatric patients with inflammatory bowel disease and children seen in pediatric gastroenterology clinics.
137.	Margaret Whedon, Michael Lewis	Developmental Changes in Facial Memory and Metamemory.
138.	Margaret Whedon, Michael Lewis	Is Metamemory Impaired in Youth with Neurodevelopmental Disorders.
139-145	Department of Pediatrics 2022-2023 Publications	

Title: The role of inflammatory cues in intestinal IgA in response to commensals and during oral vaccination.

Author(s): Chi Chang (Chris) Sung, Gaetan Barbet

Affiliation Institutions(s): Department of Pediatrics, Child Health Institute of NJ,
Presenting Author: Chi Chang (Chris) Sung

Background:
Historically, vaccine regimen comprised of live bacteria have been known to elicit more robust immune responses and a better long-term protection compared to their dead counterpart. We previously published that intraperitoneal injection of live but not dead bacteria specifically enhances follicular helper CD4 T cells (T_{FH}) differentiation, germinal center formation, IgG class-switching through the IL-1b pathway (Barbet, G et al. Immunity 2018). However, this inflammatory pathway is believed to be continuously active in the intestines due to the constant contact with commensal bacteria. We hypothesize that the role of the IL-1b pathways on IgA production in the intestines differs from its role during systemic immune responses.

Methods:
We are studying the production of IgA production in two knock-out (KOs) mice for genes involved in the IL-1b pathway compared to wild-type (Wt) mice. We are using ELISA to measure antibody production, flow cytometry to phenotype the immune cells involved in antibody production. We performed oral vaccination of the mice with *Citrobacter rodentium* or with Cholera Toxin (CT).

Results:
Under steady state and specific pathogen free conditions, we observed that the mice with a defective IL1b pathway displayed an increase in intestinal IgAs, an increase in IgA-bound bacteria but no difference in seric IgA compared to Wt mice. This local IgA increase was not due to intestinal inflammation and IgG levels were similar between the mouse groups. Germinal center formation, the percentages of T_{FH} cells and IgA-positive B cells were specifically increased in the Peyer's patches and not the mesenteric lymph nodes of the KOs compared to the Wt mice. Finally, vaccinating orally the mice with *Citrobacter rodentium* or CT demonstrated that the KOs mice were able to elicit antigen-specific intestinal IgA.

System Significance:
With this study we aim to unveil new pathways for intestinal IgA protection and advance the design of mucosal vaccines.

Title: Characterization of calcium signals and oscillations in dendritic cells in vivo in response to pathogens

Author(s): Nathalie Groot, Gaetan Barbet

Affiliation Institutions(s): Department of Pediatrics, Child Health Institute of NJ,

Presenting Author: Nathalie Groot

Background:
Dendritic cells (DCs) are disseminated throughout organisms and serve as sentinels, organizing immune responses to infection, tissue damage, and cancer. DCs play a crucial role bridging innate and adaptive immune systems and elicit a tailored adaptive immune response to the type of threat they encounter. Manipulation of DCs is critical for vaccination, and DC-based immunotherapies have been tested in clinical trials as anti-cancer therapeutics and for treatment of infectious diseases. Calcium, a ubiquitous secondary messenger, regulates many critical effector functions of DCs like phagocytosis, maturation, migration, and cytokine production. However, regulation and mobilization of calcium in DCs remains poorly understood.

Methods:
To decipher calcium signals induced by bacterial stimuli in DCs, we generated CD11c-Salsa6f reporter mice that express the fluorescent protein tdTomato fused to GCaMP6f in CD11c expressing cells. By using intravital two-photon microscopy, we are imaging the calcium signals in dendritic cells in their microenvironment. In addition, we are staining *E.coli* bacteria with a marker fluorescing in the far-red emission spectrum. Overall, this experimental system allows us to follow bacteria in an organ and the calcium signal in dendritic cells resulting of the microbial recognition.

Results:
After validating that live *E. coli* bacteria is eliciting a calcium signal in splenic DC after intravenous injection, we unveiled for the first time an oscillatory calcium signal in DCs in response to these bacteria. A frequency analysis of the calcium signal shows that specific calcium frequencies are induced by *E.coli* in DC compared to the unstimulated condition. These oscillation frequencies observed through intravital microscopy confirm our *in vitro* experiments suggesting that oscillatory calcium signaling patterns are specific to the type of bacteria.

System Significance:
Understanding the calcium signaling in dendritic cells offers the promise to identify new immuno-modulator among the variety of already FDA-approved drugs that target the calcium pathway.

Title: The twin experience and child development: communicative, cognitive, psychomotor, and psychosocial Impact

Author(s): Katherine Briski

Affiliation Institutions(s): Rutgers University

Presenting Author: Katherine Briski

Purpose:
Twins experience a unique set of biological and social conditions that are often overlooked in the classical twin study design, which poses twins as equal controls to singletons. Yet, as twins grow and develop, these unique conditions are bound to have a profound influence. This study aims to determine the impact of the twin experience on communicative, cognitive, psychomotor, and psychosocial domains of child development.

Methods:
A review of recent and historical literature was conducted through PubMed. Strict inclusion criteria were publication within 5 years and primary research studies, with results further curated based on relevance, sample size, and overall quality.

Results:
Autonomous language production and the "twinning effect," or early language delay, have been well documented and are related to the shared twin environment. By school age, however, the twin-singleton difference diminishes or even disappears, and twins achieve language skills in the normal range. Similarly, early neurodevelopmental delays are apparent in language, personal-social, and motor skills, but twins are comparable to singletons by one year, and prematurity is a major mediator. Lastly, the "couples effect" represents the unique social closeness that twins internalize and that is perceived by outsiders, which manifests in various qualitative and quantitative outcomes.

Conclusion:
As hypothesized, the unique shared twin environment is found to bear communicative, cognitive, psychomotor and social impacts beyond the effects of mediators such as prematurity alone. Although twins often catch up in communicative, cognitive, and psychomotor skills, the unique twin condition should be considered an independent variable, and twins' specific needs should not be overlooked. Overall, relatively little research focuses on twins themselves, and much remains to be explored regarding differences among subsets of the twin population, the role of secondary associations with twinning, and other lasting outcomes of twinship.

Title: Tobacco use, dependence, and age of initiation among youths with cognitive disability

Author(s): Myriam Casseus,[1] James M. Cooney,[2] Olivia A. Wackowski [3,4]

Affiliation Institutions(s): [1]Department of Pediatrics, [2] Rutgers School of Management and Labor Relations, [3] Rutgers Center for Tobacco Studies, [4] Department of Health Behavior, Society, and Policy, Rutgers School of Public Health

Presenting Author: Myriam Casseus

Purpose:
To examine the prevalence of tobacco use by product type among youths with cognitive disability; the prevalence of tobacco dependence among youths with cognitive disability; and the relationship between age of tobacco use initiation and cognitive disability.

Methods:
This cross-sectional study analyzed data from the 2019 National Youth Tobacco Survey (NYTS). Participants were a nationally representative sample of 19 018 students in grades 6-12. Estimates were calculated for ever use, current use, age of tobacco use initiation, and tobacco dependence. Associations between use patterns and cognitive disability status were examined using bivariate analyses and multivariable logistic regression.

Results:
Compared with youths without cognitive disability, youths with cognitive disability had significantly greater odds of ever using any tobacco product (aOR, 1.49; 95% CI, 1.31-1.70), currently using any tobacco product (aOR, 1.41; 95% CI, 1.26-1.58), and currently using electronic cigarettes (e-cigarettes), cigarettes, cigars, hookahs, roll-your-own cigarettes, and heated tobacco products, specifically. They had higher prevalence and odds of reporting younger age of tobacco use initiation (aOR, 1.25; 95% CI, 1.10-1.43). Higher prevalence and odds of tobacco dependence were also observed among youths with cognitive disability compared with youths without cognitive disability ($p<.001$).

Conclusion:
These findings reinforce the importance of developing early primary prevention efforts to reduce or delay tobacco use among adolescents with cognitive disability. They also suggest the need to address co-occurring disorders during tobacco cessation programs with this high-risk group.

Title: Prevalence and treatment of mental, behavioral, and developmental disorders in children with co-occurring autism spectrum disorder and attention-deficit/hyperactivity disorder: A population-based study

Author(s): Myriam Casseus,[1] Wun Jung Kim,[2] Daniel B Horton[1,3,4]

Affiliation Institutions(s): [1] Department of Pediatrics, [2] Department of Psychiatry, Rutgers RWJMS, [3] Rutgers Center for Pharmacoepidemiology and Treatment Science, Institute for Health, Health Care Policy and Aging Research, [4] Rutgers School of Public Health.
Presenting Author: Myriam Casseus

Purpose:
There is a lack of nationally representative studies examining the co-occurrence of autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) in children.

Methods:
This study examines comorbid mental, behavioral, and developmental disorders (MBDDs) and associated treatment modalities for children with co-occurring ASD and ADHD. Cross-sectional analyses were conducted using data from the pooled 2016-2018 National Survey of Children's Health (sample n = 102,341). Nationally representative prevalences were estimated for sociodemographic variables, comorbidities, psychotropic medication, and behavioral treatment. We assessed multivariable associations between co-occurring ASD + ADHD and MBDDs, use of psychotropic medication, and receipt of behavioral treatment after adjustment for sociodemographic confounders.

Results:
Compared to children with ASD without co-occurring ADHD, children with ASD + ADHD had higher prevalence of most MBDDs, including anxiety (AOR 4.03 [95% CI 2.77, 4.87]), depression (AOR 3.08 [95% CI 1.77, 5.36]), behavior or conduct problems (AOR 4.06 [95% CI 2.72, 6.06]), and other mental health conditions. Similarly, compared to children with ADHD without ASD, children with ASD + ADHD had higher odds of anxiety (AOR 3.49 [95% CI 2.65, 4.61]), depression (AOR 1.67 [95% CI 1.21, 2.29]), behavior or conduct problems (AOR 2.31 [95% CI 1.68, 3.17]), and other mental health conditions. Children with ASD + ADHD were significantly more likely to take psychotropic medication than children with ASD without ADHD. Among children with ASD + ADHD, males had higher odds of receiving behavioral treatment, whereas older children and adolescents were more likely to take psychotropic medication.

Conclusion:
A multidisciplinary approach is necessary to support the complex needs of these children.

Title: Including young adults with disabilities as standardized patients in practice visits with second-year medical students

Author(s): Caroline Coffield[1], Ciara Bosch[2], Megha Shah[2]
Affiliation Institutions(s): [1] The Boggs Center, Department of Pediatrics, [2]Rutgers RWJMS, NJ
Presenting Author: Caroline Coffield

Purpose:
Physicians and medical students often feel unprepared to address the healthcare needs of individuals with disabilities. Patients with disabilities are more likely to report being treated badly by physicians, not listened to, and left out of the clinical decision-making process. To better understand student-reported need for disability-focused learning content, a 19-question survey was distributed to 697 medical students at Rutgers RWJMS. Of the 137 students (19.6%) who responded, the majority reported feeling only *somewhat* or *not at all* prepared to care for patients with disabilities. Students endorsed opportunities to practice interview and physical exam skills with standardized patients with disabilities, in addition to more discussion with people with disabilities, as the most valuable and needed curricular additions. In response, a brief encounter with a "standardized patient" with a developmental disability and their caregiver was added to the second-year of the required Patient Centered Medicine Course.

Methods:
"Standardized patients" (SPs) were recruited via email, were mailed a script and debriefing questions in advance, and participated in a virtual practice session the week of the event. The practice clinical encounter lasted approximately 30 minutes and was facilitated by 2-4 medical students who played the role of the physician by interviewing a patient, taking a history, and addressing a complaint about medication side-effects. After the role play, the SPs shared their feedback with the students. Time was left for student questions.

Results:
A pre/post-test evaluation was used. Students expressed satisfaction with and indicated increased knowledge through brief educational encounters with individuals with disabilities. Even these brief encounters helped students feel more comfortable caring for patients with disabilities. Additional, specific findings will be shared.

Conclusion:
These results highlight how a brief encounter with individuals with disabilities can help to address knowledge gaps and attitudinal barriers that impact access to quality health care for people with disabilities.

Title: Understanding parent motivation for participating in the Pfizer COVID-19 Vaccine Trial

Author(s): Myrhiam Diarra,[1] Simon Li [2], Patricia Greenberg[3], Natale Mazzaferro[4], Maya Ramagopal[2]

Affiliation Institutions(s): [1]Student, Rutgers RWJMS, [2] Department of Pediatrics, [3] Department of Biostatistics and Epidemiology, Rutgers School of Public Health.

Presenting Author: Myrhiam Diarra

Purpose:
To understand the motivation of parents to enroll their child/children in the Pfizer COVID-19 vaccine trial.

Methods:
This was a survey-based secondary study of parents who have at least one child enrolled in the Pfizer COVID-19 vaccine trial during May 2022 through July 2022. There were 150 parents invited to participate via email and REDCap was utilized to complete consent and survey distribution.

Results:
The study sample includes 64/150 (42.6%) parents who consented to participate and completed the questionnaire. Parents discovered the COVID-19 vaccine trial via several sources including 32 (50.0%) from an announcement online or through social media, 9 (14.1%) via their pediatrician, 4 (6.2%) via their colleagues and 19 (29.75%) from other sources. The average age of children enrolled was 5.1 years old (± 3.8 years). There were 17 parents (26.5%) who reported an occupation in healthcare/allied health or research, and 8 (12.5%) reported an occupation in education or education-related jobs. Thirty-two parents (50.0%) had at least 1 child enrolled, and the remaining 32 (50.0%) reporting 2 or 3 children enrolled. Most parents, 61 (95.3%), reported a good understanding of what the trial entailed. Altruism (93.8%), trust in research (82.8%) and potential benefit to the child (90.6%) were the primary motivations to enroll their children. The fear of vaccine risks (14.1%), burden to the child (7.8%) and the fear of randomization (7.8%) were the primary concerns reported.

Conclusion:
Understanding the drivers of vaccine hesitancy is critical to the ability to implement better overall outcomes for children. Even in this cohort of highly motivated and educated parents, who had voluntarily enrolled their children in this trial, the risks of COVID-19 vaccination were expressed as a top concern. This needs to be considered when addressing vaccine hesitancy.

Title: Disparity in the reporting of child abuse in clinical practice: A scoping review

Author(s): Kristine Held Schmitz,[1]Sarah Fadem, [1] Paula Lucuara Revelo, [1] Clarissa G. Hoover, [2] Latoshia Rouse [3, 4] Marie Abraham, [5] Milton Kotelchuck, [6] Myriam Casseus, [1] Amanda Ratigan, [1]Casey Lamar,[1] Sandra Moroso-Fela,[1] Lawrence C Kleinman.[1]

Affiliation Institutions(s) [1]Department of Pediatrics, [2] Family Voices, [3] Birth Sisters Doula Services, [4] DEI and Family Engagement Consultant, [5] Institute for Patient- and Family-Centered Care, [6] Harvard Medical School

Presenting Author: Kristine Held Schmitz

Purpose:
Disparities within the child welfare system are well-documented and multifactorial. The impact of clinician referrals on disparities is not well-described. This scoping review examined approaches for studying the relationship between clinicians' referrals and disparities in the assessment of child abuse.

Methods:
The HRSA Maternal Child Health Measurement Research Network (MCH-MRN) designed this review through a national dialogue among academics, family advocates, and other experts. We queried PubMed, Scopus, Social Sciences Premium Collection, and Applied Social Sciences Index. Studies were included if they investigated 1) factors impacting clinicians' diagnosis/reporting of abuse or 2) biases in referrals from clinical settings. We assessed 2,003 articles; 21 met inclusion criteria.

Results:
Studies sought to identify disparities (n=9) and/or predictors of referrals (n=7). Eight studies looked specifically for evidence of bias. Studies used large datasets (n=8), medical records review (n=6), surveys (n=4), vignettes (n=3), and/or interviews (n=1). Among factors potentially influencing referrals, 13 studies considered patient/family characteristics only, 2 considered clinician characteristics only, and 6 looked at both. Patient/family information included sociodemographic factors, parent mental health, family structure, etc., while clinician factors included age, race/ethnicity, and training/experience. Only 2 studies considered family-clinician race/ethnicity concordance. Fourteen studies found evidence of bias in referral patterns. No articles sought descriptions of family experience regarding the process of referrals.

Conclusion:
Included studies often considered the relationship between family/child attributes and referral to child welfare, with fewer examining the influence of clinician characteristics. A critical gap in the literature includes integrating the voice of families, clinicians, and 'alumni' of the child welfare system with quantitative analyses. Such studies can lead to interventions that encourage reflection by clinicians on how their identities and experiences may impact their reporting decisions. Rigorous, nuanced health services research regarding processes and outcomes of child welfare is a critical component of the agenda for health equity.

Title: The MCH-MRN Framework: A novel framework to guide prioritization and measurement of complex health interactions across the maternal-child life course

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Presenting Author: Sarah Fadem

Purpose: The Haddon Matrix depicts a framework for recognizing and preventing injury through elaboration of complex factors and their interactions. We describe an analogous framework to understand the complex systems surrounding maternal-child health. To illustrate its application, we applied the model to environmental justice.

Methods: The Maternal Child Health Measurement Research Network (MCH-MRN) Clinical Improvement research group of researchers, family representatives, and clinicians met over 2 years. We used principles of codesign such as iterative development, partnership, and mutual understanding with stakeholders.

Results: We present a novel framework of complex pediatric health interactions in 3-dimensions inspired by the Haddon Matrix. It integrates complex, interrelated components within the contexts of the life course. In the Matrix, visually represented as a cuboid with 3 axes, the x-axis depicts the child's life course and the y-axis outlines aspects of health within the life course. The x and y axes remain static, while the z-axis is designed to be adapted to the characteristic of interest. The z-axis consists of interacting contextual and systemic factors that should be considered, such as safety, noise, or housing in the case of environmental justice. Table features the y-axis and the z-axis applied to environmental justice, explicating the interactions between elements of health (y-axis), contextual factors (z-axis), and their implications at different stages of the life course (x-axis) that can facilitate better decision-making by health services researchers and clinicians.

Conclusions: This 3-dimensional, multistep approach offers a pediatric-specific framework for facilitating decision-making by assisting child health researchers to integrate: 1) health along the life course, 2) health and well-being, and 3) contextual and systemic factors that contribute to child wellness.

Implications for Policy or Practice:
This integrated approach may help develop and evaluate interventions by providing a tool to consider the complex factors shaping child well-being.

	Aspects of Child Health and /Wellness			
Contextual Factors re: Environmental Justice	Physical	Developmental/ Emotional	Relational	Social
Housing	Conditions Exposures Overcrowding	Security/stability	Household roles Relationship strain	Housing supports available. Racism/prejudice
Noise	Hearing problems Sleep Memory impairment Elevated BP	Speech Emotional regulation Learning delays	Peer relationships	Transportation regulations
Community Safety	Violence risk Physical activity	Trauma exposure Access to nature Grief	Family loss	Community cohesion Collective efficacy

Title: Medication adherence among patients with sickle cell disease at one pediatric sickle cell center in New Jersey

Author(s): Chinwe Mercy Izegbu, Paulette Forbes, Sharon Anderson, Elizabeth Castro

Affiliation Institutions(s): Rutgers University, Rutgers Cancer Institute of New Jersey

Presenting Author: Chinwe Mercy Izegbu

Purpose:
To identify barriers and facilitators to hydroxyurea adherence
To develop concrete recommendations to enhance improvement of medication adherence.

Methods:
A structured assessment tool, with 23 quantitative questions (Likert Scale) and 3 open-ended questions for qualitative data was developed from the literature review. The surveys were administered to patients aged 12 – 21 years who are diagnosed with SCD and prescribed hydroxyurea. Data collected at a comprehensive pediatric sickle cell center in New Jersey. The analysis was done using Microsoft Excel and analyzed with SAS v9.4 for relative frequencies. Open-ended questions were analyzed thematically.

Results:
Twenty-eight participants met the inclusion criteria, one participant refused to complete the survey (n = 27). The mean age of participants was 17 years, and the mean number of medications missed per week was 2 (SD 1.30). Participants identified five major barriers and six facilitating factors to hydroxyurea adherence. There was a 96.4%completion rate, 59.3% reported that they "always" take the correct dose, 33.3% took their medication on time, and 33.3% reported that they took their medication on time "most of the time."

Conclusion:
Adherence to Hydroxyurea decreases the frequency of painful crises, hospitalizations, vascular injury, and the risk of developing early and long-term complications of SCD. Participants identified barriers and suggested ways to improve adherence. This cohort of participants indicated that they trust their provider and reviewing their blood work at visits was a major incentive to maintain and improve adherence. Integrating an adherence screening tool in the EMR will help to identify patients at risk so individualized counseling can be done.

Implications:
Change in clinic workflow, implementation of a hydroxyurea adherence assessment tool in the EMR. Creating a pamphlet with resourceful tips such as reminders, keeping medication log, peer support, group support, resources for health insurance and copay, relief funds, pharmacy coupons, etc. to share with patients.

Title: Mitophagy promotes resistance to BH3 mimetics in acute myeloid leukemia

Author(s): Christina Glytsou[1,2,3], Xufeng Chen[3], Emmanouil Zacharioudakis[4], Wafa Al-Santli[3], Hua Zhou[3], Bettina Nadorp[3], Soobeom Lee[3], Audrey Lasry[3], Michael Andreeff[5], Evripidis Gavathiotis[4], and Iannis Aifantis[3]

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Presenting Author: Christina Glytsou

Background:
Acute myeloid leukemia (AML) is an aggressive blood cancer that affects adults and children. AML is associated with dismal clinical outcomes exemplified by a 28% five-year overall survival rate. BH3-mimetic drugs are used as an efficient strategy to induce apoptosis in several hematologic malignancies, including AML. Venetoclax, a potent BCL-2 antagonist, is used clinically in combination with hypomethylating agents for the treatment of AML. Moreover, MCL-1 or dual BCL-2/BCL-xL inhibitors are under investigation. Yet, resistance to single or combinatorial BH3-mimetics therapies eventually ensues.

Methods:
To systematically uncover the prevalent mechanisms of BH3-mimetics resistance, we integrated genome-wide *loss-of-function* CRISPR/Cas9 screens in human AML cells treated with: **a)** MCL-1 inhibitors (MCL1i), **b)** MCL1i combined with venetoclax, and, **c)** venetoclax plus azacytidine. We also, established human AML patient-derived xenografts (PDX) with variable *ex vivo* responsiveness to BH3-mimetics. In addition, we generated AML clones with acquired resistance to BH3-mimetics, by growing MOLM-13 and Kasumi-1 cells in increasing doses of the drugs for over eight weeks. In these AML cells we performed biochemical experiments, high-resolution microscopy, and survival/apoptosis assays. Lastly, we used the PDXs as a preclinical platform to examine the efficacy of combinatorial treatments *in vivo*.

Results:
Our screening analyses demonstrated that deletion of mitochondrial autophagy (mitophagy) modulators sensitizes AML cells to BH3-mimetics. One such regulator is MFN2, whose protein levels positively correlate with drug resistance in patients with AML. MFN2 overexpression is sufficient to drive resistance to BH3-mimetics in AML. Insensitivity to BH3-mimetics is accompanied by augmented mitophagy flux which acts as a pro-survival mechanism to eliminate mitochondrial damage. Genetic or pharmacologic MFN2 targeting, using a novel lead compound, synergizes with BH3-mimetics by impairing mitochondrial clearance and enhancing apoptosis in AML.

System Significance:
Collectively, our study proposes novel therapeutic approaches to overcome drug resistance in hematologic malignancies.

Title: Developing a tool to support equity research: assessing reliability of the LINK COVID-19 survey to identify indices of medical and non-medical needs, stress, and positive health in People Living with HIV/AIDS during the COVID-19 pandemic.

Author(s): Ananya Gorrai, [1] Amanda Ratigan, [1] Gail Burack, [1], Sneha Jacob,[2] Patricia N. Whitley-Williams, [1] Roseann Marone, [1] Sunanda Gaur,[1] Lawrence C. Kleinman.[1]

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Presenting Author: Gail Burack

Purpose:
Assess reliability of Local Inventory of Needs and Knowledge (LINK) COVID-19 survey to identify constructs related to health, stress, and social determinants of health (SDOH) in People Living with HIV/AIDS (PLWHA).

Methods:
Cross-sectional survey conducted from 5/2020-11/2021 among adult PLWHA seen at the Robert Wood Johnson AIDS Program or the local Eric B. Chandler Health Center. The survey uses a validated LINK answer set (5-point Likert scale) with responses dichotomized at each extreme. Internal reliability assessed via Cronbach's alpha (ordinal scales) and Kuder-Richardson (KR-20) for dichotomized responses.

Results:
Eighty-nine participants completed the survey: 54% women; median age 43.5 years (interquartile range (IQR)=26.5); 49% Black, 28% Hispanic; 46% attended college; 41% insured privately. Five indices were created, all demonstrating high internal reliability: 1) modified Person-Centered Primary Care: 8 items (median=8 (IQR=6-8); KR-20=0.89); 58% indicated all factors were present; 2) Social Needs (9 items; median=2(IQR=1-5); KR-20=0.82); 84% reported ≥3 unmet needs; 3) Stress from SDOH (8 items; median=5(IQR=2-8); KR-20=0.82); 76% indicated stress due to ≥1 unmet need; 4) COVID Stress (12 items; median=7(IQR=3-10); KR-20=0.86); 93% experienced stress regarding ≥1 COVID related challenges; 5) Barriers to Healthcare (5 items; median=1(IQR=0-3); KR-20=0.73); 68% reported ≥1 unmet healthcare need.

Conclusion:
The modified LINK survey uses 42 items to reliably measure six critical constructs in a sample of PLWHA. Sixty-eight percent indicated at least one unmet healthcare need, even though Person-Centered Primary Care was frequent (58%). Unmet non-medical needs and stress related to COVID-19 were nearly universal (93%).

Implications:
The LINK survey is a valuable tool that can be used to identify health outcome disparities during the time of COVID, and likely beyond. Findings from this survey can promote research into COVID-19, SDOH, and health equity over time and across various population.

Title: Overview of global real world data sources for pediatric pharmacoepidemiologic research

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Presenting Author: Daniel B. Horton

Purpose:
Limited information is available on global sources of real-world data (RWD) for pediatric populations. We aimed to provide an overview of globally available RWD sources for pediatric pharmacoepidemiologic research, including attributes and capabilities.

Methods:
An online questionnaire about RWD sources capturing pediatric data was sent to relevant groups in the International Society for Pharmacoepidemiology (ISPE). Questionnaire responses were verified by database representatives.

Results:
Of 94 databases identified, 55 unique pediatric RWD sources were verified for pediatric pharmacoepidemiologic research. These included data from Europe (47%), North America (38%), multiple world regions (7%), Asia-Pacific (5%), and South America (2%). Most databases had nationwide coverage (80%) and contained either electronic medical/health records data (49%) or claims data (44%) (some with both).

Six databases (11%) reported having >20 million pediatric observations. Most (89%) included children of all ages (birth until age 18). Most (69%) had limited access (e.g., by approval only or through collaboration with local investigators), whereas only 9 (16%) databases were publicly available. Most (64%) could be linked with other databases for research purposes.

Most databases (93%) contained data on pediatric outpatient medications, and about half (47%) contained pediatric inpatient medication data. Two-thirds of databases captured vaccine information for children (67%), and about one-third had regularly updated data on height (31%) and weight (33%) for children. Other pediatric data attributes captured include diagnoses and comorbidities - 48 databases (87%), lab results - 31 (56%), vital signs - 29 (53%), imaging - 22 (40%), device data - 21 (38%), narrative patient histories - 17 (31%), and genetic/biomarker data - 13 (24%).

Conclusion:
Our study provides a comprehensive overview about a diverse array of databases suitable for pediatric pharmacoepidemiologic research.

Implications:
Our study allows researchers to identify fit-for-purpose RWD sources useful for pediatric pharmacoepidemiologic and other research (e.g., health services).

Title: Factors associated with failure of initial non-invasive respiratory support in late preterm and term infants and its impact on outcomes

Author(s): Bethany L. Hunt, Amy S. Parikh, Deepak Jain

Affiliation Institutions(s) Department of Pediatrics, Rutgers RWJMS

Presenting Author: Bethany L. Hunt

Purpose: Late preterm and term infants commonly receive non-invasive respiratory support (N-IRS) after birth with a small proportion of them failing and requiring escalation of this support. In contrast to extremely preterm infants, the data on N-IRS failure in this population is very limited. Therefore, our objectives were to determine the impact of initial N-IRS failure and identify risk factors in this group.

Methods:
Retrospective study of infants born at ≥ 34w GA in RWJUH from 2012-19 who required N-IRS within 12h of birth was conducted. Congenital anomalies and intubation prior to admission were exclusion criteria.
N-IRS failure was defined as: escalation of respiratory support mode, surfactant administration, increase in FiO2 >0.2 above the baseline, or absolute FiO2 >0.4 for ³3h, within 12h of admission.
In-hospital outcomes and perinatal risk factors were compared between N-IRS failure and N-IRS success groups using Chi-Square for categorical and T-test for continuous variable, or nonparametric Mann-Whitney U Test. Multivariate stepwise binary logistic regression (LRA) was used to model the association between risk factors and N-IRS failure.

Results:
Of 343 eligible infants, 52 (15%) failed initial N-IRS. N-IRS failure group had longer duration of respiratory support [1.8d (4.4) vs 0.5d (0.5), median (IQR); p <.001] and length of stay [8d (9) vs 4d (4), median (IQR); p <.001]. N-IRS failure group stayed longer on parenteral nutrition and were exposed to antibiotics more frequently.
On LRA, maternal hypertension (aOR 2.261 (95% CI 1.044 – 4.894) and GBS (aOR 2.479 (95% CI 1.128 – 5.448) were associated with N-IRS failure.

Conclusion:
N-IRS failure was associated with longer duration of respiratory support, hospital stay and exposure to prolonged antibiotics course. Interestingly, maternal hypertensive disorders and GBS were associated with the failure.

Implications:
The pathophysiological basis of this association and their role in respiratory support failure prediction needs further investigation.

Title: Association between clinician modeling and enhanced home literacy environments among Latino families: A mixed methods investigation of Reach Out and Read implementation

Author(s): Nila Uthirasamy,[1] Jennifer R. Hemler, [2] Alicja Bator,[2] Keanaan Malke Daniel Lima,[1] Pamela Ohman Strickland,[3] Usha Ramachandran,[1] Alan Mendelsohn, [4] Benjamin F. Crabtree, [2] Shawna V. Hudson, [2] Thomas I. Mackie,[5] Manuel E. Jimenez. [1, 2, 6]

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Presenting Author: Nila Uthirasamy

Purpose: To examine clinicians' descriptions of Reach Out and Read (ROR) implementation and the association of parent-reported receipt of ROR components with enhanced home literacy environments among low-income Latino families.

Methods: As part of an ongoing randomized controlled trial, we conducted a mixed-methods study of the effect of ROR components – book delivery, anticipatory guidance, and modeling of reading – on home literacy environment (HLE). Enrolling participants from three Community Health Centers, we conducted qualitative interviews with clinicians and surveyed low-income, Latino parent-infant dyads on receipt of the three ROR components and the HLE (StimQ2). We coded interviews for descriptions of ROR component implementation and analyzed data iteratively; we analyzed quantitative data using mixed models with clinician as a random effect to examine associations between modeling and number of components and HLE in separate models adjusting for covariates.

Results: Twenty-one clinicians and 287 parent-infant dyads (all Latino; 71% ≤ high school diploma) participated. Most clinicians described implementing modeling, although their descriptions of modeling varied (Figure 1). Modeling was associated with higher StimQ2 scores (standardized beta= 0.25; 95%CI: 0.13-0.36). We found a dose-response pattern: the magnitude of the association increased with a higher number of parent-reported ROR components received. With no components as the reference, receipt of one component (book or guidance) alone was not associated with HLE. Receipt of 2 components (book and anticipatory guidance) was associated with higher StimQ2 scores (standardized beta=0.26; 95%CI: 0.07-0.45). The addition of the third component, modeling, resulted in the greatest magnitude (standardized beta= 0.40; 95%CI: 0.22-0.58).
Conclusion: These findings suggest that receiving multiple ROR components is beneficial for low-income Latino families, especially when adding modeling. Findings support that clinician modeling is a core ROR component and should inform training and healthcare improvement efforts seeking to promote equity in early language experiences through ROR.

Figure 1: Simplified Representative Process Map of Clinicians Delivering ROR (with and without modeling)

Clinician Modeling (n=13)
Clinicians described how they modeled reading during well visits. Descriptions ranged from opening a book and flipping through pages to asking children questions based on pictures in the book in an animated voice:
"[I have] not shown them how to read, but sometimes I'll just – with the child, just sometimes point at pictures and see [what they do] . . . because parents have a tendency to give cell phones to 6 months old, 9 months old, so sometimes I'll give them a book to encourage them, instead of giving a baby your cell phone give a book."
"I'll kind of have the book, and then I'll kind of like engage the child and I'll kind of like flip through the pages and let them kind of feel it, have a – like a texture exposure, as well. And then at that age, most likely the parent has to actually read the words, kind of. But I kind of just flip through the pages, and then they're excited and they're holding it, so they look like they're engaged and they want someone to like do something with it with them."
"[S]howing mom how to engage. It's not even telling [her what to do]. It's like, we do it in the room, like let's say the kid looks at the book and we say like, 'oh, who's this, what color is this? Is it green? Is it verde? Is it blue? Is it azul?' And then, you know, kind of showing mom through example how to read – I mean it's not really reading. It's just all baby faces. But talking to the baby like, 'what number is this, is it one? It's numero uno. And what else is one? Like how many siblings do you have? How many brothers and sisters do you have? Oh, just one?' And just like kind of tying it off into like different examples and conversation topics. And then going back to the mom and saying, 'okay, that's what we want you to do, we want you to engage with your child and kind of using just one page as a steppingstone to talk about so many different things.' "

Title: Parent (caregiver) reported outcomes of COVID-19 in children and adolescents after at least 90 Days

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Research Objective:

Post-acute sequelae of COVID-19 (PASC) in children include a poorly understood entity known as "long COVID". We used data from an ongoing NIH-funded study of COVID-19 to gain insight into parent (caregiver) perspectives regarding symptoms after SARS-CoV-2 infection in children/adolescents.

Study Design:

Cross-sectional survey (1/2022 to 11/2022) of caregiver-reported findings using a questionnaire adapted from the LINK survey, validated at Rainbow Babies and Children's Hospital and in use for~5 years. The 5-point Likert scale ranges from Completely False to Completely True and is dichotomized at each extreme, depending on valence of the stem (e.g., either Completely True that they believe the child is back to baseline health, or not; either Completely False that they believe their child had Long COVID, or not). We present findings on participants surveyed ≥90 days after the presenting illness.

Population Studied:

We recruited 3 cohorts of children/adolescents infected by SARS-CoV-2 and enrolled in the NIH-funded CONNECT to Predict Sick Kids study: 1. Mild/asymptomatic infection; 2. hospitalization for COVID-19 pneumonia/acute respiratory distress syndrome; and 3. MIS-C. We focus on those surveyed ≥90 days after their initial illness (n=60; 58%) with median days since presentation of 253 [IQR 225].

Principal Findings:

Characteristics of sample are shown in Table 1. Table 2 summarizes the parent-reported outcomes being studied.

Conclusions:

Substantial proportions of caregivers of children/adolescents with prior SARS-CoV-2-related illness report symptoms lasting ≥1 month (per CDC definition of long Covid) and ≥3 months (per WHO definition of long Covid), with highest rates of continued symptoms among those with MIS-C. Caregivers of participants with more severe COVID-19 or MIS-C were less likely to report very good or excellent states of health than those who had mild or asymptomatic infections Caregiver belief that their child had long COVID ranged from 75% for MIS-C to 21% in the Mild cohort.

Implications for Policy or Practice:

Caregiver reports can offer important insight into pediatric health outcomes for COVID-19. Long COVID may be common in children and adolescents.

Table 1. Characteristics of study population by the number of days since initial illness.	**0-29 days (n=28)**	**30-89 days (n=15)**	**≥90 days (n=60)**	**Total (n=103)**
Age (y), Median (IQR)	4.0 (9)	13.0 (10)	10.0 (9.5)	9.0 (10)
Male Sex	61%	40%	50%	51%
Non-Hispanic White	36%	40%	40%	39%
Non-Hispanic Black	29%	13%	13%	17%
Hispanic	4%	13%	20%	15%
Non-Hispanic Asian	7%	13%	2%	5%
Mild/asymptomatic	18%	53%	50%	42%
COVID-19 Pneumonia	46%	27%	18%	27%
MIS-C	36%	20%	32%	31%

Table 2. Key parent-reported measures for surveyed ≥90 days after initial illness.	**Mild**	**Pneumonia**	**MIS-C**
Health back to Normal within **1 month**	71%	29%	25%
Health back to Normal within **3 months**	86%	71%	33%
Still Experiencing Some Brain Fog at time of survey, **Completely False**	86%	86%	74%
I believe my child experienced Long COVID **Completely False**	79%	45%	25%
My Child experienced **No** Harm to their Development **Completely True**	77%	57%	17%
Very Good or Excellent **Overall Health** at time of Survey	90%	36%	63%
Very Good or Excellent **Mental Health** at Time of Survey	80%	45%	68%

Title: Beyond the diagnosis: health promotion and anticipatory guidance in the pre-clinical pediatric medicine curriculum.

Author(s): Erica R. Levin,[1] Betsey Mathew,[2] Paul Weber,[2] Kristen Coppola,[2] Elizabeth Goodman,[2] Usha Ramachandran [2]

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Presenting Author: Erica R. Levin

Purpose:
To evaluate the acceptability and effectiveness of a newly introduced small group session for first year medical students, designed to build knowledge, and confidence in pediatric preventive care.

Methods:
All first-year medical students at Rutgers, Robert Wood Johnson Medical School participated in a 1-hour long small group session on pediatric preventative care. During the session, medical students role-played with faculty to practice conducting pediatric histories and physicals, to provide anticipatory guidance, and to promote child health and development. All students who attended the session were eligible to participate in the study, but participation was voluntary and anonymous. Students who consented to participate were asked to complete pre- and post-session surveys which were analyzed to assess change in knowledge and confidence. Acceptability and impact of session were assessed through analysis of student feedback on the post-session surveys.

Results:
139 pre-session surveys and 81 post-session surveys were completed. Analysis of surveys is ongoing. Preliminary results show that after the small group session, participants felt more confident about interviewing a child and parent (53.2% pre v. 79.41% post). Students demonstrated increased knowledge in providing anticipatory guidance and health promotion (24.2% pre v. 90.4% post). Participants' knowledge scores regarding physical examination, history-taking, and shared reading, increased (61.64% pre v. 71.03% post). A majority of students found the formal to be effective (77%) and the length of the session to be appropriate (63%). The vast majority of students agreed that the session contributed to their development as physicians regardless of their future specialty choice (91%), and that the session should continue to be offered to future M-1 students (86%).

Conclusion:
The small group session was very well received by medical students and was effective in increasing students' knowledge and confidence in pediatric preventative care. The pre-clinical curriculum tends to focus more on disease and differential diagnoses. By emphasizing the importance of prevention, anticipatory guidance and health promotion in pediatrics, this small group session can educate medical students from early in their careers to approach medicine from a life-course perspective and through a health promotion and prevention lens.

Title: Parents' perspectives on strengthening clinician-parent partnerships

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Presenting Author: Erica R. Levin

Purpose:
to further understand parents' perspectives on the clinician-parent partnership and how pediatric clinicians can strengthen relationships with families to more effectively support health outcomes.

Methods:
We conducted virtual focus groups with a purposive sample of 37 parents of children age ≤ 7 years, using a guide prepared with input from community partners and parent advisors. Focus groups were recorded and transcribed verbatim. Focus group data was analyzed qualitatively, and themes were identified using standard inductive and iterative processes.

Results:
Thirty-seven parents participated in 8 focus groups (median parent age: 36.0 years; 43.2% Asian, 18.9% Black/African American; 32.4% Hispanic/Latino; 78.4% mothers). Four main themes were identified: (1) Parents identified adequate time, access, and continuity as the most important components of effective patient care. (2) Parents expressed a strong need for a personal connection between clinician and child, and clinician and parents, but felt that lack of time during visits, and lack of continuity with the same clinician prevented the development of this connection. (3) Parents needed clinicians to demonstrate empathy and respect for the family's perspectives and culture, to build trust. (4) Parents desired additional resources, such as instructional pamphlets and videos, to allow them to feel more confident in their knowledge and skills.

Conclusion:
Clear and timely communication, empathy and cultural sensitivity, adequate time and continuity to build relationships, and additional informational resources were identified as main contributors to effective partnerships between clinicians and families. Clinicians should pay careful attention to these factors to build trusted partnerships with families to support child well-being and health outcomes most effectively.

Title: SARS-CoV-2 oral fluid antibody prevalence among unvaccinated children in New Jersey

Author(s): Bozena J. Katic, Jessica Alvitres, Joseph V. Schwab, Charles Li, Manisha Gurumurthy, Reed Magleby , Isaura Otero, Loen Alburquerque, Angelic Fiuza, Celine Molfetta, Arianne Ramos, Monica Siu, Alan S. Weller, Sunanda Gaur, Elsie Roca-Piccini, Uzma Hasan, Cecilia DiPentima, Aspasia Katragkou , Pauline Thomas, Stephen Friedman

Affiliation Institutions(s): Rutgers New Jersey Medical School, RWJ Barnabas Health, Atlantic Health System, New Jersey Department of Health, CDC Foundation

Presenting Author: Alan Weller

Purpose:
Reopening schools and lifting masking and distancing mandates across New Jersey (NJ) has increased COVID-19 transmission among children in the state. While children are frequently exposed to SARS-CoV-2, they are least likely to be vaccinated against the virus. Little is known about SARS-CoV-2 antibody prevalence in children. We examined SARS-CoV-2 antibody prevalence in unvaccinated NJ children and evaluated the role of household vaccination status.

Methods:
Unvaccinated children aged 18 months to 11 years had oral fluid antibody tests for SARS-CoV-2 and their caregivers completed electronic surveys at two clinic-based practices in Northern and Central NJ from August 2022 to December 2022. Antibody results were compared to survey responses. Information was collected on household exposures, family vaccination status, COVID-19-related illness, and beliefs about pediatric vaccination.

Results:
A total of 480 children submitted oral swabs and a corresponding survey. Respondents were 55% male, predominantly non-Hispanic Black (39%) or Hispanic/Latino (37%), and on average, 5.6 years old. Antibody positivity of this sample was 65%. Of those, 31% (n=94) reported ever having been diagnosed with COVID-19, and less than half sought care for their symptoms. Of those reporting exposure to COVID-19 (n=182, 38%), 77% reported exposure in the household. The majority (69%) of children were from households with at least one fully vaccinated adult. Families of antibody-positive children had a significantly lower proportion of fully vaccinated adults in the household compared to antibody-negative children ($p< 0.05$).

While 68% (n=312) of caregivers felt the vaccine was at least somewhat effective in preventing disease, only 25% planned to vaccinate their child against COVID-19 in the next 6 months. Those from households with at least one vaccinated adult were significantly more likely to plan to vaccinate their child than those with no vaccinated adults (33% vs 7%, $p< 0.001$); this proportion increased with each additional vaccinated adult in the household.

Conclusion:
Overall antibody positivity in this sample is nearly double the proportion diagnosed with COVID-19. Despite the prevalence of household COVID-19 exposures, caregiver vaccination status, and caregiver understanding of the beneficial role of vaccination in preventing disease, the majority of caregivers do not plan to vaccinate their children. Increasing vaccine acceptance among parents and other adults may provide opportunities to increase uptake of pediatric vaccinations over time.

Title: Feasibility of a peer-to-peer parent mentoring program for parents of children recently diagnosed with cancer

Author(s): Karen L Long-Traynor, [1] Katie A Devine,[1] Susan Stephens,[1] Michael Lewis,[1] Peter D. Cole.[1]

Affiliation Institutions(s) [1]Rutgers Cancer Institute of New Jersey

Presenting Author: Karen Long-Traynor

Purpose:
The diagnosis of childhood cancer is potentially one of the most distressing experiences a parent can have. Poor social support is one of the factors that have been identified that contributes to higher levels of parent distress. This study aims to create and test the feasibility of a parent-to-parent mentoring program in which parents of children newly diagnosed with cancer receive support from a parent of a survivor.

Methods:
The mentoring program in this study involves a three-month virtual mentoring relationship. Mentors will be trained via workbook and virtual workshop. Feasibility of training and implementing the mentoring program will be determined by >50% enrollment and >75% retention and reported satisfaction. A secondary aim was to explore the preliminary effectiveness on mentor and parent outcomes using qualitative interviews and quantitative questionnaires.

Results:
To date 10 parent mentors have gone through training, seven dyads have completed the intervention, and two more are ongoing. 100 % of Mentors rated the training as acceptable. Mentors did not show an increase in empathy or listening skills but were already above average at baseline. 48% of mentees approached agreed to participate and 53% of those enrolled completed the intervention. Of those mentees that completed the intervention 86% found it beneficial overall, 100% reported increased feeling of support and reduced feeling of isolation, and 71% reported reduction in distress.

Conclusion:
Parents who completed the mentoring program found it to be helpful but the retention rate was lower than expected. While helpful to a small subset of parents of newly diagnosed children, it is apparent that this type of intervention cannot replace professional support and may not be feasible to be run in smaller hospital settings. Instead, it may be better for national or regional foundations to take the lead in these types of programs.

Title: Effect of physical fatigue on cognitive ability in multiple sclerosis (MS) patients

Author(s): Sourabh Prakash Mudakannavar,[2] Elangovan, Mitila,[2] Hsieh, Eileen,[2] Vrindten, Kiera,[2] Bhise, Vikram,[1] Hundal, Jasdeep,[3] Cohen, Evan T.[4]

Affiliation Institutions(s): Pediatric Neurology, Department of Pediatrics, Rutgers RWJMS, NJ[1,], Rutgers Graduate School of Biomedical Sciences[2,], Jersey Shore University Medical Center[3], Arcadia University[4]

Presenting Author: Sourabh Prakash Mudakannavar

Purpose:
It is well known that inducing physical fatigue in people with Multiple Sclerosis (MS) through strenuous activities has a negative impact on physical performance. Whether there is, a similar effect on cognitive function is unknown. The purpose of this study was to determine whether inducing physical fatigue reduces cognitive function. We hypothesized that cognitive function will decrease after physically fatiguing activity.

Methods:
As part of a larger study of cognitive rehabilitation for people with MS, a subgroup of 14 participants with walking impairments was distinguished. Participants completed the oral and written Symbol Digit Modalities Test (SDMT), and Trails Making Test (Trails) A & B. Participants then completed a 6-minute walk test and Timed-up and Go test to induce physical fatigue. The SDMT and Trails were retested immediately after. Comparisons of SDMT and Trails scores before and after inducement of physical fatigue were analyzed with the Mann-Whitney U test due to the non-normalized data and small sample size.

Results:
There were no significant pre/post differences in SDMT and Trails. However, we observed a trend toward improvement in cognitive testing. Of the 14 participants, 11 improved on SDMT written, 12 improved on SDMT oral, 12 improved on Trails A, and 9 improved on Trails B scores.

Conclusion:
The notable trend toward improvement may be attributed to a confounding practice effect or a positive effect of physical activity. The practice effect from repeated exposure to the same tests in a short time period may cause score improvements. Instead of a fatiguing effect, the physical activity may have had an invigorating effect, resulting in cognitive test improvements. The combination of potential confounders and a small sample size may explain the lack of statistical significance. Further exploration should be undertaken with a larger sample size and controls to account for the learning effect.

Title: Small-for-Gestational-Age and vocabulary and achievement test scores at age 9 among children born at term in a contemporary U.S. sample

Author(s): Erini D. Papas,[2] Nancy E. Reichman,[1,2,3] Hope Corman,[4,5] Kelly Noonan,[6] Kirsten B. Kuhn,[7] and Thomas Hegyi[2]

Affiliation Institutions(s): [1]Division of Population Health, Quality, and Implementation Science, Department of Pediatrics, Robert Wood Johnson Medical School, Rutgers University; [2]Division of Neonatology, Department of Pediatrics, Robert Wood Johnson Medical School, Rutgers University; [3]Child Health Institute of New Jersey, Rutgers University; [4]Department of Economics, Rider University, [5]National Bureau of Economic Research; [6]Department of Economics, Princeton University; [7]School of Public and International Affairs, Princeton University

Presenting Author: Erini D. Papas

Purpose:
Children born small-for-gestational-age (SGA) are at increased risk for cognitive impairment, even if born at term (37-41 weeks). This study examined sex-specific and racial/ethnic-specific associations between SGA and vocabulary and achievement tests in children born at term using a contemporary population-based US sample.

Methods:
A secondary analysis was conducted on a sample of 2,144 children born at term in 1998-2000 who participated in a US birth cohort study that oversampled non-marital births, which in the US are prevalent and associated with socioeconomic disadvantage and racial minority status. The Peabody Picture Vocabulary Test (PPVT) and Woodcock-Johnson Passage Comprehension (WJ9) and Applied Problems (WJ10) tests were administered to the children in person at age 9. Unadjusted and adjusted Ordinary Least Squares and logistic regression models of associations between SGA and test scores were estimated.

Results:
Sex-specific SGA was associated with 2–5 point lower test scores and 1–2 times higher odds of scores <85 (>1 SD below the national mean) across most outcomes, as well as with scores <85 on the WJ10 (OR: 2.257; 95% CI: 1.434, 3.551) and WJ9 (OR: 1.554; 95% CI: 1.132, 2.134). Racial/ethnic-specific SGA was associated with 2 points lower test scores and 1.3-1.5 higher odds of scores <85 across most outcomes.

Conclusion:
This study expanded and updated the relatively small literature on SGA and developmental outcomes among children born at term by focusing on a contemporary US sample and considering both sex-specific and racial/ethnic-specific SGA.

Implications:
The findings suggest that SGA children born at term should be targeted for early interventions to promote improved cognitive functioning in school.

Title: Biomarkers of neurocognitive decline after childhood leukemia treatment

Author(s): Yongkyu Park, Kayla Baker, Peter Cole

Affiliation Institutions(s): Division of Pediatric Hematology Oncology, Rutgers Cancer Institute of New Jersey, NJ

Presenting Author: Yongkyu Park

Purpose:

Treatment for children with acute lymphoblastic leukemia (ALL) is typically curative but is associated with neurotoxicity that can permanently impair cognitive functioning. Specifically, childhood leukemia survivors consistently demonstrate measurable deficits, leading to inferior school and occupational performance, and diminished quality of life. The purpose of our research is that those individuals at greatest risk of treatment-induced neurocognitive decline are identified within the early months of leukemia therapy when pharmacologic interventions might prevent permanent neurocognitive deficits. A key strength of our approach is pairing the use of a validated, reliable, non-invasive measure of cognitive functioning (Cogstate) with analysis of genetic variants and cerebrospinal fluid (CSF) biomarkers linked to the pathophysiology of treatment-induced cognitive function.

Methods:

(1) To identify patients with subclinical treatment-related neurocognitive decline during the first months of treatment, the serial Cogstate assessments are performed during therapy for childhood ALL. Scores for each subtest are compared with age-specific norms to generate z scores.

(2) To identify likely predictors of treatment-induced neurocognitive and behavioral deficits, five polymorphisms in genes related to oxidative stress and/or neuroinflammation are examined with allele-specific PCR (NOS3, SLCO2A1, COMT, GSTP1, HFE).

(3) To identify susceptibility to oxidative stress in leukemia patient brain, biomarkers of oxidative damage (8-OHdG and/or Tau accumulation) are assayed with CSF collected during leukemia therapy.

Results & Conclusion:

Among 350 survivors of childhood ALL in a previous study, five polymorphisms in genes above were associated with significantly increased risk of exhibiting inferior neurocognitive and behavioral function more than five years after diagnosis with ALL. By increasing susceptibility to the toxic effects of chemotherapy, these polymorphisms could be indicators to predict a pattern of early neuro-decline during therapy. We also predicted a high-risked group from the oxidative assays (8-OHdG and Tau accumulation) of CSF. We will test whether this group is associated with differences in neurocognitive outcomes (Cogstate).

Title: Investigating genetic susceptibility for chemotherapy-induced cognitive impairment in a juvenile ApoE4 rat model

Author(s): Chadni Patel[1, 2], Frank Diglio[2], Jeremy Willekens[2], Derek Adler[3], Yongkyu Park[2], Peter D. Cole[1, 2]

Affiliation Institutions(s): [1]Department of Cellular and Molecular Pharmacology, Rutgers University, Piscataway, NJ, [2]Department of Pediatric Hematology & Oncology, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, [3]Rutgers Molecular Imaging Center, Rutgers University, Piscataway, NJ

Presenting Author: Chadni Patel

Background:
While most children with cancer can be cured, many survivors experience chemotherapy-induced cognitive impairment (CICI) (or "chemobrain"), leading to difficulty with attention and memory and impacts the quality of life. The interpatient variability in susceptibility to CICI is not well understood. In addition to environmental factors, it is likely that common gene variants explain some of the observed variability. One possible mechanism for CICI is chemotherapy-related changes in blood brain barrier (BBB) integrity, allowing influx of proinflammatory cytokines and oxidative damage within the CNS. Our laboratory focuses on the variant E4 allele of APOE (Apolipoprotein E), which has been linked to decreased BBB integrity and increased permeability compared to the more common E3 allele. Pediatric cancer survivors with the E4 allele of APOE are more likely to display cognitive dysfunction than those without this allele following treatment with identical chemotherapy doses.

Methods:
Juvenile rats homozygous for either the human ApoE4 or ApoE3 gene were exposed to doxorubicin at a clinically relevant dose (2 mg/kg of doxorubicin once weekly for 4 weeks). BBB integrity was assessed using contrast-enhanced magnetic resonance imaging (MRI). Behavioral assays of cognition were then used to test whether the rats bearing the ApoE4 allele were more susceptible to doxorubicin-induced memory deficits.

Results:
Doxorubicin caused spatial memory impairments in both ApoE3 and ApoE4 rats compared to their respective controls. ApoE4 doxorubicin treated rats were more likely to exhibit visual memory impairments than ApoE3 treated doxorubicin rats when compared to their respective controls. Changes in BBB integrity within hippocampus and prefrontal cortex are now being investigated by MRI.

System Significance:
Overall, the experimental outcomes shed light on ApoE4 genetic susceptibility to CICI, setting the stage for further investigation.

Title: Investigating the impact of doxorubicin on the blood brain barrier for chemotherapy-induced cognitive impairment

Author(s): Chadni Patel[1, 2], Jeremy Willekens[2], Frank Diglio[2], Yongkyu Park[2], Peter D. Cole [1, 2]

Affiliation Institutions(s): [1]Department of Cellular and Molecular Pharmacology, Rutgers University, Piscataway, NJ, [2]Department of Pediatric Hematology & Oncology, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ

Presenting Author: Chadni Patel

Background:
Although chemotherapies have significantly improved overall survival in pediatric cancer patients, the current drugs are associated with detrimental side effects such as cognitive impairment, or "chemobrain". Chemotherapy-induced cognitive impairment (CICI) comprises of symptoms including deficits in working memory, information processing speed, multitasking, fine motor skills and concentration. Despite extensive research into the multifactorial causes of CICI, there are no FDA approved drugs to prevent it or reduce its severity. These measurable deficits may persist years after chemotherapy treatment, which significantly alters the quality of life for patients. Specifically, a commonly used pediatric cancer chemotherapeutic agents in curative regimens for children with cancer, doxorubicin plays a pivotal role in CICI. Our laboratory proposes to address the poorly understood mechanism of CICI by studying changes in blood brain barrier (BBB) integrity *in vitro*. The BBB opening allows entry of neurotoxic factors that normally cannot penetrate and will cause mitochondrial dysfunction in brain endothelial cells, induce neuroinflammation, thus affecting the BBB integrity.

Methods:
To investigate the mechanisms of BBB disruption induced by doxorubicin, we are utilizing human cerebral microvascular endothelial cells (hCMEC/d3).

Results:
There was a significant decrease in the mitochondrial membrane potential upon doxorubicin exposure in hCMEC/d3. Additionally, there was a significant increase in the gene expression of pro-inflammatory markers: IL6, IL1β and ICAM1, all of which play a critical role in the BBB disruption. Further, doxorubicin robustly increases the activation of p38 mitogen-activated protein kinase (MAPK), suggesting its possible contribution to the doxorubicin induced inflammatory response in hCMEC/d3.

System Significance:
Our findings provide insights on the potential role of BBB disruption in CICI, and this work aligns with our ongoing *in vivo* experiments. The exact mechanism for CICI is unclear, making these studies highly significant to begin to unravel the mechanism and provide insights for preventative measures for the clinical trial development of CICI.

Title: Investigating the impact of doxorubicin on the microbiome in a juvenile rat model

Author(s): Chadni Patel[1, 2], Jeremy Willekens[2], Frank Diglio[2], Yongkyu Park[2], Peter D. Cole[1, 2]

Affiliation Institutions(s): [1]Department of Cellular and Molecular Pharmacology, Rutgers University, Piscataway, NJ, [2]Department of Pediatric Hematology & Oncology, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ,

Presenting Author: Chadni Patel

Background:
In the past several decades, there is a significant improvement in survival for children with cancer, however, many survivors experience significant side effects leading inferior quality of life like chemotherapy induced cognitive impairment (CICI) and chemotherapy induced gastrointestinal toxicity. A growing body of literature implies the gut-brain axis in modulating neurological and inflammatory physiology. Our laboratory hypothesizes that chemotherapy treatment for cancer alters the gut microbiome, possibly contributing to CICI.

Methods:
We utilized a commonly used pediatric cancer chemotherapy drug, doxorubicin in our juvenile rat model. At 5 weeks of age, both male and female Long Evans rats were treated with a clinically relevant doxorubicin regimen (2 mg/kg once weekly for 4 weeks). 48 hours post the last injections, fecal samples were collected to perform microbiome analyses. Behavioral assays of cognition were then used to test which rats were more susceptible to doxorubicin-induced memory deficits.

Results:
Doxorubicin caused significant spatial and visual memory impairments when compared to saline treated controls. Doxorubicin-treated rats displayed an increase in alpha diversity when compared to the control rats. Differences were observed between doxorubicin-treated and control rats, including an increase in the abundance of the phylum *Actinobacteria,* a decrease in the abundance of the phylum *Bacteroidetes*, a decrease in the order *Bacteroidales*, and at the genus level, there was a decrease in the abundance *Muribaculum* and *Paramuribaculum*. Although doxorubicin treatment significantly decreases the relative abundance of the genus *Prevotella,* this change specifically was associated with differences in doxorubicin-induced cognitive deficits.

System Significance:

Overall, the experimental outcomes of our preliminary studies provide insights for potential therapeutic targets for not only chemotherapy induced gastrointestinal toxicity, but also provides insights for the plausible correlation of the microbiome and CICI.

Title: ERK – Signaling regulates human T-cell leukemia virus type 1 RNA stability and gene expression in latently infected CD4 T-cells

Author(s): Lin H-C,[1,2] Li M-L[3], Brewer G[3], Rabson AB[1,2,4]

Affiliation Institutions(s) [1] Child Health Institute of New Jersey, Rutgers Robert Wood Johnson Medical School (RWJMS), New Brunswick, NJ, [2] Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, [3] Department of Biochemistry and Molecular Biology, Rutgers RWJMS, Piscataway, NJ, [4] Department of Pharmacology, Rutgers RWJMS, Piscataway, NJ.

Presenting Author: Hsin-Ching Lin

Purpose: The Human T Cell Leukemia Virus Type 1 (HTLV-1) causes a number of diseases including a devastating leukemia/lymphoma, inflammatory disorders, and infective dermatitis in children. The major routes of HTLV-1 transmission are through breast milk and sexual transmission. HTLV-1 infection may be latent, with no or very low-level expression of viral proteins. We seek to understand the mechanisms responsible for viral latency and activation of viral gene expression by T cell receptor and phorbol ester (PMA) stimulation which we have shown involves increased *tax/rex* mRNA stability and increased Tax protein. We are studying signaling pathways and RNA-binding proteins that regulate HTLV-1 RNA stability.

Methods: HTLV-1 latently infected, FS cells were treated with inhibitors of MAPKs (PD184352 and SB203580) to dissect pathways important for HTLV-1 mRNA stability. Phosphorylation status was assayed by Western blot analysis. Expression of HTLV-1 RNAs was measured by quantitative RT-PCR. Measurements of RNA levels following actinomycin D treatment were used to determine RNA stability. An oligonucleotide-hybridization based method (HyPR) was used to purify HTLV-1 RNA-protein complexes. Enriched mRNA was detected by qRT-PCR, and precipitated RNA-binding proteins were detected by Western blot analysis.

Results: PMA treatment resulted in increased phosphorylation of ERK1/2 but not of p38 kinase in FS cells. Inhibition of ERK blocked PMA-induced HTLV-1 RNA expression and blocked increased *tax/rex* mRNA stability. HyPR using a *tax/rex* mRNA-based oligonucleotide probe specifically enriched *tax/rex* mRNA. The AU-rich RNA binding protein, HuR, was specifically associated with *tax/rex* mRNA in untreated FS cells, and, surprisingly, appeared to decrease upon PMA stimulation.

Conclusion: PMA-induced, increased *tax/rex* mRNA stability and HTLV1 RNA expression in latently infected FS cells is dependent on ERK signaling. The AU-rich RNA binding protein HuR is associated with *tax/rex* mRNA in these HTLV-1 infected cells and may play a role in regulating HTLV-1 latency.

Title: Local inventory of needs and knowledge (LINK) for COVID: An expanded instrument for caregiver report to assess key constructs related to children and adolescents infected with SARS-CoV-2.

Author(s): Amanda Ratigan, [1] Daniel Horton, [1] Sunanda Gaur, [1] Simon Li, [1] Benjamin Richlin,[1] Christian Suarez,[1] Uzma Hasan, [2] Aalok Singh, [3] Yukiko Kimura, [4] Dawn Wahezi, [5] Wilson Pace, [6] Patrick Brady, [7] Katherine Auger, [6] Theresa Wampler Muskardin, [7] Sabah Kalyoussef,[8] Christopher Stille, [9] Saquib Lakhani, [19], Hulya Bukulmez, [11] David Kaelber,[12] Beth Dworetzky,[13] Christina Hester, [14] Jason Roy, [15] Matt Hall, [16] Alex Fiks, [17] Jay Berry,[18] Kristine Schmitz,[1] Myriam Casseus, [1] Sarah Fadem, [1] Sandee Moroso, [1] Maria Laura Gennaro, [19] Lawrence Kleinman.[1]

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Presenting Author: Amanda Ratigan

Purpose:
LINK is a validated survey to assess met/unmet clinical/nonclinical needs of children and women in primary care settings. We present internal reliability of LINK expanded to address COVID-19.

Methods:
Cross-sectional survey conducted 1/2022-11/2022 among caregivers of pediatric patients who had mild/asymptomatic (n=43) or severe (hospitalized; n=28) COVID-19, or multisystem inflammatory syndrome (MIS-C; n=32) from 3/2020-11/2022. Cognitive interviews were done using LINK's answer set – 5-point Likert scale ranging from completely false to completely true dichotomized at one extreme for analysis. Items were removed to optimize efficiency and internal reliability using both Cronbach's alpha (CrA; ordinal responses) and Kuder-Richardson statistic (KR-20; dichotomized responses).

Results:
Overall, there were 103 participants with a median age (child)=9 years(IQR=10), 51% male, 39% Non-Hispanic White, 17% Non-Hispanic Black, and 15% Hispanic. Five indices were assessed: **1) Access to Care** (7 items; KR-20=0.77): 60% reported ≥2 barriers to care; median of the sum of positive items=5 and interquartile range (IQR)=4; **2) Practice Characteristics** (KR-20=0.89; median=5(IQR=3)) includes 6 stems from the Person-Centered Primary Care Measure: 60% reported the presence of ≥5 factors; **3) Social Needs** (4 items; KR-20=0.87; median=1(IQR=3)): 60% reported ≥1 unmet nonmedical needs; **4) Social Stress** (8 items; KR-20=0.88; median=3(IQR=5)): 80% reported having ≥1 perceived stress due to unmet nonmedical ('social') needs; **5) COVID Stress** (6 items; KR-20=0.75; CrA=0.84; median=4(IQR=3)): 82% reported stress on ≥3 challenges related to the COVID-19 pandemic.

Conclusion:
The LINK answer set is reliable and informative using 31 items to assess 5 constructs in this population of caregivers of children who experienced SARS COV-2 infection. While financial needs were common, most viewed their clinical practice highly; yet access was suboptimal. Stress was high with 80% and 95% reporting ≥1 social stressor and ≥1 COVID-specific stressor, respectively.

Implications:
The LINK-COVID survey is reliable and may enhance the assessment of family perspectives in pediatric COVID-19 studies.

Title: Trends in characteristics of U.S. children and youth with SARS-CoV-2 infection and multisystem inflammatory syndrome

Author(s): Amanda Ratigan, [1] Matt Hall, [2] Jason Roy, [3] Kathy Augur, [4] Patrick Brady,[4] Myriam Casseus, [1] Alex Fiks,[5] David Kaelber, [6], Lawrence Kleinman, [1] Daniel B. Horton.[1]

Affiliation Institutions(s): [1]Department of Pediatrics, Rutgers RWJMS; [2] Children's Hospital Association, KS; [3] Department of Biostatistics and Epidemiology, School of Public Health, Rutgers University, NJ; [4] Division of Hospital Medicine, Department of Pediatrics, Cincinnati Children's Hospital Medical Center, OH; [5]Department of Pediatrics, Perelman School of Medicine, University of Pennsylvania and Children's Hospital of Philadelphia, PA; [6] The MetroHealth System, OH.

Presenting Author: Amanda Ratigan

Purpose:
Examine trends in demographic and clinical characteristics in U.S. children and youth with COVID-19 and MIS-C.

Methods:
Serial cross-sectional study of persons ages ≤21 years diagnosed with mild COVID-19 (discharged from emergency department), moderate/severe COVID-19 requiring hospitalization, or MIS-C at freestanding children's hospitals (3/1/2020-6/30/2022). Characteristics were stratified by waves of the pandemic. Prevalences of characteristics over time were estimated by diagnosis, and trends were evaluated using Cochran-Mantel-Haenszel tests. Absolute between-group differences in characteristics from waves 1/2 (ancestral strains) to waves 6/7 (Omicron) were calculated.

Results:
155,818 children and youth were identified with mild COVID-19 (92.6%), severe COVID-19 (4.3%), or MIS-C (3.1%). Across all waves, compared to those with mild COVID-19, those with severe COVID-19 or MIS-C tended to be older and were more likely non-Hispanic White, privately insured, and with pre-existing comorbidities. Overall, patients with MIS-C were more likely to be male, and those with severe COVID-19 had substantially higher rates of chronic comorbidities. Compared to early waves of the pandemic, severe COVID-19 and MIS-C were increasingly prevalent (vs. mild COVID-19) during Omicron among females, children 1-11 years old, non-Hispanic Whites, and those from communities with more resources. Over time, severe COVID-19 was increasingly prevalent among those <1 year old and with government insurance, while MIS-C was increasingly prevalent among those ages 18-21 years of Hispanic/Latino ethnicity or non-Hispanic Asian race, with private insurance, and from higher-resource communities. The relative prevalence of most comorbidities besides obesity was higher among children and youth with severe COVID-19 in the Omicron era compared to early waves of the pandemic.

Conclusion:
Compared to early waves of the pandemic the characteristics of children and youth with severe COVID-19 or MIS-C were distinct in the Omicron era, with more severe disease among non-Hispanic Whites, patients from higher-resource communities, and, for those with COVID-19, children with comorbidities besides obesity.

Title: Age and subject status (TD vs. At-Risk) intercessory integration

Author(s): Michael Rozylowicz, Mrudula Gattu, Michael Lewis

Affiliation Institutions(s): Institute for the Study of Child Development

Presenting Author: Michael Rozylowicz

Purpose:
Intersensory integration involves the temporal coordination of auditory and visual information in the environment. Children tend to struggle when visual and auditory information are temporally incongruent. The degree of temporal incongruency affects children's ability to integrate information. Prior studies have established that children with autism spectrum disorder (ASD) need larger temporal binding windows, suggesting potential difficulties in processing multisensory information. This study focuses on exploring the intersensory integration capabilities in 4-month and 18-month-old children, including some children at risk for ASD.

Methods:
78 Ss were seen at 4 and 18 months, comparing two kinds of movement/sound integration, face-voice integration and bouncing ball against wall integration. Preliminary analysis using data from 25 Ss is available. Stimuli pairs were displayed across two screens, with matching and mismatched videos delayed by various binding windows, including 0.333s, 0.500s, 0.666s, 0.833s, and 1.000s. Both stimuli use the same temporal windows. Each Ss preferred binding window was calculated based on looking times.

Results:
Figures 1a and 1b show binding windows (0.333s/0.500s/0.666s/0.833s/1.000s) and the % of Ss who preferred each. Findings for both stimuli show that infants are capable of detecting Face-Voice and Ball-Bounce discrepancies of 0.333s. In addition, both age groups showed a strong preference for the smallest binding window of 0.333s. Figures 2a and 2b indicated that Typically Developing Ss show a greater preference for the 0.333s binding window, while at-risk Ss show no preference.

Conclusion:
Findings suggest that children are able to recognize small discrepancies in audio-visual stimuli from an early age. These findings also suggest that this procedure can be used to effectively examine intersensory integration, which may be related to language capacity and other social skills.

Title: Small-for-gestational age and age at menarche in a diverse population-based U.S. sample

Author(s): Sruchika Sabu, [1] Hope Corman, [2] Kelly Noonan,[3] Nancy E. Reichman,[1,4] Kirsten B. Kuhn, [5] Sally Radovick.[1]

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Presenting Author: Sruchika Sabu

Purpose:
To investigate associations between small-for-gestational age (SGA) status in girls and their age at menarche in a largely disadvantaged U.S. sample.

Methods:
Secondary data analysis was conducted on 992 female children in a U.S. birth longitudinal cohort study of mostly non-marital births, which in the U.S. are strongly associated with socioeconomic disadvantage. SGA was defined as <10th percentile weight for gestational age within the sample. We estimated unadjusted and adjusted Ordinary Least Squares (OLS) models of associations between SGA and age at menarche in years, as well as unadjusted and adjusted logistic regression models of associations between SGA and menarche before age 11.

Results:
SGA was associated with slightly earlier menarche but the difference was not statistically significant (OLS coef.: -0.039; CI: -0.319, 0.240), even when adjusting for maternal sociodemographic characteristics (OLS coef.: -0.030; CI: -0.319, 0.259) and when further adjusting for prenatal smoking and maternal overweight and obesity (OLS coef.: -0.005, CI: -0.296, 0.286). Similarly, SGA was not significantly associated with the odds of menarche before age 11 in unadjusted (OR 1.360; CI: 0.789, 2.344) or adjusted models (OR 1.263; CI: 0.714, 2.234 and OR 1.239; CI: 0.695, 2.211). Maternal non-Hispanic Black race-ethnicity, Hispanic ethnicity, and pre-pregnancy obesity all had independent associations with earlier menarche as well as menarche prior to age 11.

Conclusion:
Our findings indicate that SGA-status is not significantly associated with age at menarche and that previously established associations between both race-ethnicity and maternal obesity and age at menarche are apparent even in a largely disadvantaged U.S. sample.

Implications:
It does not appear that changes in adiposity proposed by SGA models in the literature are as influential for the timing of menarche as changes in adiposity associated with race-ethnicity or other maternal factors, though this requires further study.

Title: Paternal postpartum depression and children's adverse childhood experiences at age 5.

Author(s): Kristine Schmitz, [1] Manuel E. Jimenez, [1] Hope Corman, [2] Kelly Noonan, [3] Nancy E. Reichman.[1]

Affiliation Institutions(s) [1] Department of Pediatrics, Rutgers RWJMS, [2] Department of Economics, Rider University, NJ, [3] Department of Economics, Princeton University, NJ

Presenting Author: Kristine Schmitz

Purpose:
To investigate associations between depression in fathers of infants and children's adverse childhood experiences (ACEs) at age 5

Methods:
We analyzed data on 1933 father/child dyads from the Future of Families and Child Wellbeing Study, a national U.S. urban birth cohort. By design, ~75% of the mothers were unmarried. Paternal depression was assessed using a validated instrument when the child was 1-year old and children's ACEs were reported by their mothers 5 years later. ACEs included 5 measures of household chaos (father absence, maternal depression, substance use, incarceration, violence towards caregiver) and 4 types of child maltreatment (psychological, neglect, physical, sexual). We used measures of overall exposure to ACEs (>=1 ACE, >=2 ACEs, 3+ ACEs) as well as specific ACEs. We estimated unadjusted and adjusted logistic regression models of associations between paternal depression and ACEs. Adjusted models controlled for father, family, and child characteristics and maternal depression.

Results:
Nine percent of the fathers experienced depression during the postpartum year and 70% of the children experienced >= 1 ACE at age 5. In unadjusted logistic regression models, children whose fathers had depression had almost 3 times higher odds of >= 1 ACE (OR 2.94, CI 1.88-4.62) and over 2 times higher odds of 3+ ACEs (OR 2.40, CI 1.72-3.36). In adjusted models, associations remained robust with an OR of 2.35 (CI 1.45-3.81) for >= 1 ACE and 2.04 (CI 1.42-2.93) for 3+ ACEs.

Conclusion:
Children whose fathers experienced postpartum depression were more likely to experience multiple ACEs at 5 years, above and beyond maternal postpartum depression and other potentially confounding factors.

Implications:
Preliminary findings show a robust association between fathers' postpartum depression and children's adversity. Expanding maternal and child health policy and practice to include fathers and early identification with robust intervention for paternal depression may stave off childhood adversity.

Title: Students helping individuals facilitate transition (SHIFT): A sickle cell disease intervention

Author(s): Mariah Jacqueline Scott, [1] Adrienne S. Viola, [2,3] Hanin Rashid, [4] Richard Drachtman, [5] Amanda Kaveney, [6] Ashwin Sridharan,[6] Beth Savage,[7]Elliot Coups,[8] Cristine Delnevo,[9] Jerlym S. Porter,[10] Katie A. Devine.[11]

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Presenting Author: Mariah Jacqueline Scott

Purpose:
In the United States, physicians and residents report inadequate training in managing adolescents and young adults (AYA) during the transition from pediatric to adult care, in particular AYAs with chronic illnesses such as sickle cell disease (SCD). Medical students can serve as similar-aged "peers" who can offer informational support as well as developmentally appropriate social support to AYA patients during the period of transition. In this report, we describe the design and preliminary medical student outcomes of a medical student mentor intervention to improve transition education for AYAs with SCD.

Methods:
We developed a medical student mentor intervention that pairs medical students with an AYA with SCD who are preparing to transition from pediatric to adult care. After receiving training, medical students conducted six monthly video-chat calls with mentees to address transition and disease self-management. Students completed baseline and follow-up surveys measuring attitudes towards chronic illness, SCD knowledge, etc., as well as qualitative feedback interviews upon completion of the intervention. Feasibility and acceptability were measured by enrollment and retention rates, satisfaction with intervention, as well as med. student Attitudes Towards Chronic Illness.

Results:
Nine medical students were paired with a total of 24 patients. Student retention was 100%. Students reported increased knowledge about managing a chronic illness and transition, improved understanding about the patient's experience navigating the healthcare system, barriers to healthcare, and enhanced patient communication skills. Medical students reported high satisfaction with the intervention.

Conclusion:
A medical student mentor intervention was both feasible and acceptable to medical students and may provide an opportunity for value-added medical education. Further research is needed to evaluate the efficacy of this type of student mentoring intervention on both student and patient outcomes.

Title: Community-wide efforts to improve COVID-19 vaccination in children in the State of New Jersey

Author (s): Harsh Sharma,[1] Jasmine Sandhu, [2] Pragyan Sharma, [3] Usha Ramachandran, [4] Lawrence Kleinman, [4] Sunanda Gaur, [4] Lisa Mikesell, [3] Jennifer Forbes Mullenhard, [6] Lakshmi Nandini Moorth. [4]

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Presenting Authors: Harsh Sharma and Jasmine Sandhu

Purpose:
Widespread disparity in healthcare access and literacy likely contributes to COVID-19 vaccine hesitancy among parents. We used a three-pronged culturally sensitive approach: (i) developing a website with COVID-19 and vaccine resources in commonly spoken languages in NJ (ii) conducting a webinar for pediatricians and families incorporating interactive panel discussions with pediatric specialists., and (iii) disseminating information via multiple community outreach programs.

Methods:
In addition to researching, we worked with a team of bilingual members to develop the website in different languages. The webinar was developed by multiple pediatric specialists from Robert Wood Johnson Medical School (RWJMS) and had sessions for English-speaking parents, Spanish-speaking parents, and practitioners. The website and webinar were promoted through different avenues.

Results:
The website provides credible and accurate information on COVID-19 and vaccines in the following 10 languages: English, Spanish, Tagalong, Mandarin, Hindi, Korean, Gujarati, Arabic, Russian, Haitian Creole The web analytics revealed that the English had the most page views. There were 61 attendees in the webinar, of the which 41 were English-speaking parents and 20 were practitioners. There were no Spanish-speaking parents. The webinar was well received by both parents and practitioners.
Dissemination of information occurred through RWJMS social media and email networks, NJ American Academy of Pediatrics, South Asian Total Health Initiative, news publishers, and fliers.

Conclusion:
The COVID-19 website developed as part of this project is a valuable tool that can be shared across community organizations different ethnic groups and used by practitioners to provide culturally competent information. Recordings of the webinar on COVID-19 remains a vital resource and can be accessed on the website. The broad dissemination efforts reached several communities in Central NJ. However, the lack of Spanish-speaking participants further emphasizes that further work is required to engage the community.

Title: Mitochondrial bioenergetics and neurological damage after 1 minute of cardiac arrest and return of spontaneous circulation after resuscitation with RA or 100% Oxygen.

Author(s): Sutharsanam B,[1] Solevåg A.L,[2] Sosunov S,[1] Solberg R,[2,3] Niatsetskaya Z,[1] Ten V.[1]

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Presenting Author: Sutharsanam B.

Background:
NRP guidelines recommend no supplemental oxygen for initiation of resuscitation in term neonates. 100% oxygen (O2) is recommended if chest compression is required. There are no clinical data comparing room air (RA) or O2 in achieving the return of spontaneous circulation (ROSC). While animal research showed no difference in achieving ROSC with RA or O2 resuscitation, a significantly greater recovery of cerebral oxygenation has been reported in O2 -resuscitated animals compared to RA-revived ones.

Hypothesis:
Compared to that with RA, resuscitation with 100% O2 is superior for the recovery of cerebral mitochondrial function.

Methods:
DOL 10 C57BL mice underwent right carotid artery ligation, tracheal intubation and asphyxia (ventilation with 5% O2) until circulatory arrest (CA). Systemic blood flow (SBF) was measured by the Doppler in the hind paw. After 60 s of CA, resuscitation was started by ventilation with RA or O2. ROSC was defined as 30% of the baseline SBF. After 4 days of recovery, brains were Nissl stained and examined for ischemic injury. Another cohort of mice was used to assess mitochondrial respiration at different times of reperfusion.

Results:
Asphyxia dramatically inhibited and uncoupled mitochondrial respiration. Resuscitation of mice with RA or O2 resulted in a similar rate and time to ROSC (65± 9.6s vs 58±17.9s). At 5 minutes of reperfusion, mitochondria isolated from O2-resuscitated mice exhibited significantly greater recovery of respiratory control ratio compared to their RA-counterparts (5.05±0.73 vs 3.98±0.71, p=.02). No difference was detected in the recovery of phosphorylating respiration rates. The extent of brain injury in both groups is being analyzed.

Significance:
Our data suggest that resuscitation with 100% O2 is superior to RA in the recovery of mitochondrial coupling. Because our model of asphyxia induces brain injury, further research will determine if resuscitation initiated with 100% O2 is superior for neurological recovery.

Title: Exposure to enterotoxigenic *Bacteroides fragilis* is common in pediatric patients with inflammatory bowel disease and children seen in pediatric gastroenterology clinics

Author(s): Melissa Weidner,[1] Shaoguang Wu,[2] Xinqun Wu,[2] Myron Jackson,[2] Courtney Stevens,[2] Victoria Campodonico,[2] Silvia Cohen,[2] Robert Yolken,[3] Maria Oliva-Hemker,[4] Cynthia Sears.[2]

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Presenting Author: Melissa Weidner

Purpose:
Enterotoxigenic *Bacteroides fragilis* (ETBF) is an opportunistic bacterium which induces chronic colitis through a toxin, *Bacteroides fragilis* toxin (BFT). Limited data based on fecal analyses suggest an increased prevalence of ETBF in inflammatory bowel disease (IBD).

Methods:
Children with and without IBD from outpatient pediatric gastroenterology clinics at Johns Hopkins were prospectively enrolled. Sera samples were collected from October 2007-December 2009. Baseline demographics, medications, type of IBD and disease activity were recorded. Recombinant *Bacteroides fragilis* toxin (BFT*)* isotypes 1 and 2 were purified using an *Escherichia coli*-expressed system. Serum anti-BFT 1 and 2 antibodies were measured by ELISA. Multivariate logistic regression was performed. Subgroup analysis for Crohn's disease (CD) versus ulcerative colitis (UC) and disease activity were evaluated.

Results:
126 patients had ≥1 sera sample available (IBD N=65, control N=61). There were no differences in gender or race between the two groups. Overall, there was no difference in anti-BFT-1 and anti-BFT-2 antibody levels between children with and without IBD or children with CD versus UC or active versus inactive disease. Approximately 72% of IBD and 70.5% of control had serum antibodies against BFT-1 and 69% of IBD and 59% of control had serum antibodies against BFT-2. Overall, serum antibodies against BFT-1 and BFT-2 increased with age.

Conclusion:
To our knowledge this is the first study to evaluate ETBF exposure in children serologically. Our data suggest that ETBF exposure is common, increases with age and is not different between children with and without IBD.

Implications:
ETBF has also been associated with colorectal cancer. Given our findings suggest that exposure to ETBF is common in childhood and given the potential association of ETBF in adult IBD and colon cancer, further prospective, long-term studies are needed to better understand the relationship of this bacterium and these disease states.

Title: Developmental trends in facial memory and metamemory

Author(s): Margaret Whedon[1] & Michael Lewis[1]

Affiliation Institutions(s): Department of Pediatrics, Institute for the Study of Child Development, Rutgers RWJMS,

Presenting Author: Margaret Whedon

Purpose:
Metamemory (i.e., knowledge of one's own memory) is a feature of higher-order cognition that may support adaptive social functioning in youth, but its developmental course is not well understood. In this study, age related differences in facial memory and metamemory were examined in a typically-developing sample ranging in age.

Methods:
Participants (N=170, 6-24 years) completed a facial memory task on the computer. During encoding, 32 b/w photos of faces were sequentially shown; during recall, participants saw 32 faces (16 new), indicated whether each was old or new, and provided a confidence rating (1=very unsure, 5=certain). Accuracy and the average response latency and confidence rating for correct and incorrect trials were calculated; metamemory was quantified by the difference (correct – incorrect).

Results:
Across age, response latencies are significantly faster and confidence judgments higher for correct compared to incorrect trials. Age is significantly correlated with accuracy ($R=.34^{**}$), response latency on correct trials ($R=-.24^{**}$), and confidence on incorrect trials ($R=-.19^{**}$). Across age, accuracy is significantly positively correlated with the difference in confidence between correct and incorrect, but responding faster on correct compared to incorrect is not significantly associated with overall accuracy or the accuracy of confidence judgments until adolescence.

Conclusion:
Alongside improvements in facial memory, TD youth show age-related improvements in metamemory as reflected in more realistic confidence judgments and greater coherence between response tendencies. In children, responding faster on correct compared to incorrect trials may reflect implicit knowledge that is not directly accessible to consciousness via introspection but that supports the development of uncertainty monitoring by providing a mnenomic cue for confidence ratings. In general, findings suggest that different levels of self-awareness (subjective and objective; Lewis, 1991) are becoming integrated during adolescence. Additional work is needed to understand how this is accomplished in the brain and whether it is disrupted in youth with neurodevelopmental disorders.

Title: Facial memory and metamemory among youth with neurodevelopmental disorders

Author(s): Margaret Whedon, Michael Lewis

Affiliation Institutions(s): Department of Pediatrics, Rutgers RWJMS, Institute for the Study of Child Development

Presenting Author: Margaret Whedon

Purpose:
Deficits in self-awareness may contribute to social impairments in youth with neurodevelopmental disorders. In this study, we examined the associations between facial memory, metamemory (i.e., knowledge of one's own memory), and social skills in youth with ASD and ADHD in comparison to TD.

Methods:
Youth (35 ASD, 45 ADHD, 61 TD) completed a facial memory task on the computer. During encoding, 32 b/w photos of faces were sequentially shown; during recall, participants saw 32 faces (16 new), indicated whether each was old or new, and provided a confidence rating (1 = very unsure, 5 = certain). Accuracy and the average response latency and confidence rating for correct and incorrect trials were calculated; metamemory was quantified by the difference (correct – incorrect). Perspective- taking skills were assessed with the Social Responsiveness Survey.

Results:
Across groups, confidence is greater on correct compared to incorrect trials but only TD youth respond faster on correct compared to incorrect trials on average. Youth with ASD are significantly less accurate than TD children, but among those who perform well (<3 errors, N=10), correct responses are made significantly slower than incorrect, and confidence does not significantly differ by trial accuracy. Among youth with ADHD, high-performers (who tend to be older) respond faster and express greater confidence than low-performers regardless of item accuracy. Youth with ASD and ADHD have lower perspective-taking than TD regardless of overall accuracy or the accuracy of confidence judgments. However, when youth with ADHD respond faster on correct compared to incorrect trials, their perspective-taking skills are significantly greater (more similar to TD).

Conclusion:
The relation between actual and perceived memory performance is weaker among youth with ASD and ADHD compared to TD youth, which may reflect underlying deficits in self-awareness. Additional research is needed to understand whether metamemory skills are amenable to training.

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