RUTGERS
Robert Wood Johnson Medical School

Department of Pediatrics

Annual Research Day

Child Health Institute CHI – 3101

& WebEx

Wednesday, May 11, 2022

Agenda

8:00 – 8:05 AM	**Opening Remarks** **Lawrence C. Kleinman, MD, MPH, FAAP** Professor and Vice Chair for Academic Development Division Director, Division of Population Health, Quality, and Implementation Science (PopQuIS) Rutgers Robert Wood Johnson, Medical School
8:05 - 8:45 AM	**Resident Presentations:** **Moderator: Joann Carlson MD** Associate Professor and Division Director, Pediatric Nephrology Program Director, Pediatric Residency Program Rutgers Robert Wood Johnson, Medical School
8:05 - 8:20 AM	**Kathrine Baldwin, DO:** *"Medical Marijuana and Cannabinoid products in Pediatric Hematology Oncology: Provider Perceptions*
8:20 - 8:45 AM	**Seherisch Ahmad, MD & Courtney Greene, DO:** *"A Retrospective analysis, comparing three dosing regimens of Intravenous Ketorolac for treating acute pain in pediatric patients"*
8:45 - 10:15 AM	**Podium Presentations:** **Moderator: Anna Petrova MD, PhD, MPH** Professor of Pediatrics Division of Population Health, Quality, and Implementation Science (PopQuIS) Rutgers Robert Wood Johnson, Medical School
8:45 - 9:00 AM	**Elizabeth Goodman, MD** Associate Professor of Pediatrics, Associate Program Director, Rutgers-RWJ Pediatric Residency Program Director, Pediatrics Clerkship Director, Pediatric Bootcamp Rutgers Robert Wood Johnson, Medical School "Ed*ucating pediatric residents on promoting positive parenting: A statewide collaborative approach"*
9:00 - 9:15 AM	**Sarah E. McGuire, Medical Student:** "*Relationship between Race, Ethnicity, and Time to Diagnosis of Juvenile Idiopathic Arthritis "*
9:15 - 9:30 AM	**David Cordoba, Research Assistant: "***Family or factory medicine? Diverse parents' perspectives on early relational health and the role of pediatric clinicians"*
9:30 - 9:45 AM	**Gaétan Barbet, PhD** Assistant Professor of Pediatrics Rutgers Robert Wood Johnson Medical School Resident Scientist, Child Health Institute of NJ "*Immune Consequences of Apoptotic Intestinal Epithelial Cell Sampling by mononuclear phagocytes"*
9:45 - 10:00 AM	**Margaret Whedon, PhD:** Adjunct Assistant Professor Institute for the Study of Child Development Rutgers Robert Wood Johnson, Medical School *"Adrenocortical reactivity to social evaluative threat and internalizing symptoms in adolescence: The role of negative self- evaluation"*
10:00 - 10:15 AM	**Maria Neginskaya PhD:** Adjunct Instructor, Dept. of Pediatrics Rutgers Robert Wood Johnson Medical School "*Mitochondrial permeability transition in the evolution of neonatal hypoxic- ischemic brain injury*"
10:15 - 11:30 AM	**Poster Viewing (via Canvas) - *If you have not received an invitation to participate, please email Maricel***
12:00 - 12:55 PM	**Keynote Speaker:** **Nancy Reichman, PhD** Professor of Pediatrics Division of Population Health, Quality, and Implementation Science (PopQuIS) Rutgers Robert Wood Johnson Medical School *"The FFG3 Study: A Sneak Preview"*
12:55 - 1:00 PM	**Sally Radovick, MD** Professor and Henry Rutgers Term Chair, Department of Pediatrics Senior Associate Dean for Clinical and Translational Research Rutgers Robert Wood Johnson Medical School Chancellor's Scholar Rutgers Biomedical and Health Sciences Physician-In-Chief, Bristol Myers- Squibb Children's Hospital

Poster Viewing (via Canvas)

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3. Dominguez, Odeilis - Spanish-Speaking Families Use of Telemedicine during the COVID-19 Pandemic **(Abstract#9)**
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10. Manzano, Jeffrey - Prune Belly Syndrome Associated with Interstitial 17q12 Microdeletion: a case report **(Abstract#20)**
11. Manzano, Jeffrey - Factor XI deficiency in a term neonate **(Abstract#19)**
12. Nandankar, Nimish **-** Absence of Kisspeptin in KNDy neurons of mice causes sexually dimorphic metabolic dysfunction on a high-fat diet **(Abstract #40)**
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17. Uthirasamy, Nila - A scoping review of Reach Out and Read implementation in pediatric settings **(Abstract#34)**
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1 Interrupted IGF-1 signaling in the hypothalamic GHRH-neurons regulates weight gain and energy expenditure in HFD-induced obesity mice.

Sarmed Al-Samerria,[1] Nimish Nandankar,[1] Ariel L. Negrón,[1] Sally Radovick.[1]

[1] Laboratory of Human Growth and Reproductive Development, Department of Pediatrics, Rutgers RWJMS.

Purpose: It is well established that IGF-1 signaling plays a pivotal role in regulating GH production through a negative feedback mechanism. Previously, we created a transgenic mouse model with ablation of the IGF-1R in the GHRH-Neurons and we termed it GIGFRKO. The GIGFRKO mouse model appeared to have a normal liner growth until wk 14 of age when both males and females began to have a decrease in weight gain velocity on a normal chow diet. We know that GIGFRKO mice have a post-pubertal reduction in weight gain, higher energy expenditure, and lower body fat mass on a standard chow diet. In this study, the effects of 16 wk of HFD-induced obesity were investigated in 4-weeks-old GIGFRKO mice.

Results: The GIGFRKO mouse model on HFD showed a normal linear growth until at wk 10 of age when both males and females began to have a decrease in velocity of weight gain compared to their age and sex-matched controls. The metabolic assessments analysis demonstrated that the GIGFRKO transgenic mice had higher O2 consumption, lower CO2 production, a reduction in body fat mass, an elevation in energy expenditure and improved glucose tolerance compared to the control mice on HFD. This was not associated with changes in either total or ambulatory activity.

Conclusion: The GIGFRKO transgenic mice were resistant to diet-induced obesity possibly due to regulating energy expenditure and whole-body fat metabolism.

2. Pulmonary involvement in childhood-onset SLE: a single center retrospective study

Alexa Altchek,[1]Lakshmi Moorthy,[1] Cynthia Salvant, [1] Lakshmi Uppaluri.[1]

[1]Department of Pediatric, Rutgers RWJMS, NJ

Purpose: Pulmonary involvement in childhood-onset systemic lupus erythematosus (cSLE), contributes to a significant amount of morbidity and mortality. They can range from chronic interstitial pneumonitis, pneumonia, pleuritis, alveolar hemorrhage, and shrinking lung syndrome. However, many patients can be asymptomatic from a respiratory standpoint and still have pulmonary function test (PFT) abnormalities. Our aim is to describe PFT abnormalities in patients with cSLE.

Methods: We completed a retrospective review of 42 patients with cSLE followed at our center from July 2015 to July 2020. These patients were at least 6 years old (so they could complete PFTs).

Results: Out of the 42 patients, 10 (23.8%) had abnormal PFTs. These 10 patients had a mean age at diagnosis of 13 ± 2.9 years. Nine were female. One-fifth (20%) self-identified as Hispanic, 20% as Asian, 10% as Black or African American, and the remaining 50% as Other. Of the 10, 3 had restrictive disease only, 3 with diffusion impairment only and 4 with both restrictive lung disease and diffusion impairment (low DsbHb). Patients with restrictive patterns had a mean total lung capacity (TLC) of 72.5 ± 5.8 (n=8) throughout the study period. The average diffusing capacity for carbon monoxide corrected for hemoglobin (DsbHb) among patients with diffusion limitation during the study period was 64.8 ± 8.3 (n=9). These PFT abnormalities at baseline and at latest follow-up are shown in Table 1.

Patient #	SLE Organ Involvement	Pulmonary Abnormality at Baseline	TLC at Baseline	DsbHb at Baseline	Pulmonary Abnormality at Follow Up	TLC at Follow Up	DsbHb at Follow Up	Time (mo) to Follow Up	Medications
1	Lupus nephritis (IV)	Restrictive	74	96	Data Not Available	Data Not Available	Data Not Available	6	Hydroxychloroquine sulfate
2	Lupus nephritis (III, V) Hypertension (HTN) Asthma End-Stage Renal Disease (ESRD)	Diffusion Limitation	89	71	Diffusion Limitation Restrictive	68	66	18	Hydroxychloroquine sulfate Mycophenolate sodium
3	Lupus nephritis (I) HTN	Restrictive	77	98	Data Not Available	Data Not Available	Data Not Available	24	Hydroxychloroquine sulfate
4	None	Diffusion Limitation	Data Not Available	68	No abnormality	120	112	6	Hydroxychloroquine sulfate Prednisone
5	Retinal vasculitis Avascular necrosis of femoral heads	Diffusion Limitation, Restrictive	75	65	Restrictive	76	84	30	Mycophenolate mofetil Prednisone
6	Sjogren's Syndrome	Diffusion Limitation	99	73	No abnormality	101	88	6	Hydroxychloroquine sulfate Mycophenolate mofetil Methylprednisolone
7	Antiphospho-lipid Syndrome Lupus nephritis (IV) Vasculitis Libman-Sacks Endocarditis HTN	Diffusion Limitation	87	45	Data Not Available	Data Not Available	Data Not Available	12	Hydroxychloroquine sulfate Mycophenolate mofetil Prednisone
8	Pneumonitis Asthma	Diffusion Limitation	80	68	Diffusion Limitation Restrictive	60	60	36	Hydroxychloroquine sulfate Prednisone
9	Cauda equina syndrome	Restrictive	77	86	Data Not Available	Data Not Available	Data Not Available	6	Mycophenolate mofetil Prednisone
10	Lupus nephritis (V)	Diffusion Limitation, Restrictive	73	67	Data Not Available	Data Not Available	Data Not Available	6	Hydroxychloroquine sulfate Methylprednisolone

Conclusion: The most common manifestation of cSLE patients is restrictive lung disease and limitations in diffusing capacity. None of the patients with cSLE exhibited obstructive disease. Children with SLE need continued monitoring with PFTs. Long-term follow up is required to report prognosis in our center.

3. Immune consequences of apoptotic intestinal epithelial cell sampling by mononuclear phagocytes

3.Chi-Chang Sung, [1,2] Gaetan Barbet [1,2]

[1]Child Health Institute of New Jersey; [2] Department of Pediatrics, Rutgers RWJMS

Purpose: Cells within the intestinal epithelium undergo apoptosis as a result of continuous turnover. Despite the fact that death of intestinal epithelial cells (IEC) constitutes an important part of the physiology of the intestine, little is known about how IEC apoptosis influences the regulatory and inflammatory processes within the intestine. Importantly, excessive IEC death is a hallmark of inflammatory bowel diseases (IBD) and has been proposed to constitute a pathogenic mechanism driving Crohn's disease.

Methods: We generated a new mouse model to identify the mononuclear phagocytes (MP) involved in the clearance of IECs. In this mouse model the IECs express a fusion protein, the diphtheria toxin receptor (DTR) coupled to enhanced green fluorescent protein (eGFP), controlled by the villin promoter. Therefore, DTR expression not only allowed induction of IEC death by injecting diphtheria toxin but the eGFP expression also allowed to track and characterize the MP populations responsible for apoptotic IEC engulfment.

Results: We precisely determined the identity of three intestinal MPs (two subsets of macrophages and one of dendritic cells) that sample or phagocytose apoptotic IEC during turnover of the intestinal epithelium in absence of inflammation. We characterized the unique transcriptional profiles of apoptotic IEC-sampling MPs, showing that they all shared a common "suppression of inflammation" signature. We observed that several of the genes differentially expressed by phagocytes bearing apoptotic IEC overlapped with susceptibility genes for IBD. We have characterized a single population of dendritic cells capable of migrating to mesenteric lymph nodes to instruct regulatory CD4 T cell differentiation after phagocytosis of apoptotic IECs. According to their signature of "suppression of inflammation," we are characterizing further how the MPs that phagocytosed apoptotic epithelial cells orchestrate intestinal homeostasis through their interaction with cells as T cells or innate lymphoid cells.

Conclusion: By asking how cell death of intestinal epithelial cells influences the function of the intestinal mononuclear phagocyte compartment, we aim to identify the cellular response modules and interconnections that could be targeted therapeutically in chronic inflammatory disorders such as IBD associated with extensive and persistent tissue damage

4. Does emotion knowledge mediate the relationship between neglect and behavior problems in early childhood?

David Bennett, [1,2] Jourdon Robinson, [2] Margaret Wolan Sullivan,[1] Michael Lewis.[1]

[1] Department of Pediatrics, Rutgers RWJMS, NJ; [2] Department of Psychiatry, Drexel University, PA

Purpose: Neglected children are at-risk for externalizing and internalizing behavior problems, although the processes by which they develop such problems are poorly understood. The current study examines emotion knowledge as a mediator of the relationship between neglect and behavior problems.

Methods: Child neglect history was assessed at age 4.0 years using Child Protective Services records (N = 127; 44% with a history of neglect); children completed an emotion knowledge battery at 4.5 years; and teachers rated behavior problems on the Teacher Report Form at 6- to 7-years of age.

Results: Examining direct effects, neglect and the emotion knowledge composite both predicted total behavior problems. The emotion knowledge composite mediated the relationship between neglect and total behavior problems, as well as the relationship between neglect and externalizing problems. This finding was largely due to the significant mediation effect of contextual knowledge in models predicting both total behavior problems and externalizing problems.

Conclusion: Overall, our findings suggest that one pathway by which young, neglected children can develop behavior problems is through relative deficits in emotion knowledge. As such, early screening of emotion knowledge skills and interventions targeting enhancement of emotion knowledge skills could help to prevent the onset or worsening of behavior problems among young children with histories of neglect.

5. The differences and similarities of facial memory development in three groups: Autism Spectrum Disorder, Attention Disorders, and Typically Developing

Michelle Cheng,[1] Michael Lewis. [1]

[1] Institute for the Study of Child Development, Department of Pediatrics, Rutgers RWJMS, NJ

Purpose: Facial processing plays a crucial role in guiding social interaction. Symptomatology in Autism Spectrum Disorder (ASD) and Attention Disorders (AD), particularly social cognitive deficits, overlaps considerably, resulting in the inability to provide targeted interventions.

Methods: Three groups, TD, with AD, and with ASD, engaged in a facial memory task. Participants first memorized 16 faces, and they were then shown 32 faces (16 faces shown previously and 16 new faces) and asked if they had seen the face before and how confident they were in their response. Participants were assigned to either the free-looking condition, where no facial encoding instructions were given, or the guided-looking condition, where certain facial features were highlighted.

Results: Accuracy improved with age for TD group, $r = .26$, $p < .001$, and group with AD, $r = .34$, $p < .01$, but not for the group with ASD, $r < -.01$, $p = .99$. The TD group ($M = 25.33$, $SD = 4.25$) and the group with AD ($M = 24.62$, $SD = 3.81$) performed better than the group with ASD ($M = 20.87$, $SD = 4.81$), $\chi 2\ (2) = 24.47$, $p < .001$. The TD group responded more quickly during the recall phase, $\chi 2\ (2) = 27.68$, $p < .001$, but were less confident than the clinical groups, $\chi 2\ (2) = 47.14$, $p < .001$. The TD group, $U = 745.5$, $p < .01$, and the group with AD, $U = 268.00.5$, $p < .01$, performed better when facial encoding was guided while the group with ASD did not differ between conditions, $U = 182.50$, $p = .41$.

Conclusion: The present findings show that the development of facial memory in the group with AD was more like the TD group than the group with ASD in that their facial memory improves with age and can benefit from guided facial encoding. These findings suggest that individuals with ASD may have a specific facial memory impairment that neither improves with age nor can be ameliorated by training. With the evidence facial training is effective in individuals with AD, clinicians can provide targeted interventions to improve facial memory in individuals with AD, and in turn foster their social skills. For individuals with ASD, facial memory is a clear, specific deficit and should considered to be included to their major symptomatology

6. The role of perspective-taking in facial memory in an undiagnosed group and a group with Autism Spectrum Disorder.

Michelle Cheng, [1] Michael Lewis. [1]

[1] Institute for the Study of Child Development, Department of Pediatrics, Rutgers RWJMS, NJ

Purpose: Individuals with Autism Spectrum Disorder (ASD) are characterized by their poor social skills, particularly perspective-taking, as well as their aversion of faces. Little is known about the relationship between facial memory and perspective-taking in individuals with ASD and whether such relationship can be extended to an undiagnosed group.

Methods: A group of undiagnosed individuals and a group diagnosed with ASD engaged in a facial memory task. Participants first memorized 16 faces and were then shown 32 faces (16 faces shown previously and 16 new faces) and asked if they had seen the face before and how confident they were in their response. Participants' social skills were evaluated using the Social Responsiveness Scale-2 (SRS).

Results: A Principal Components Analysis was conducted to determine SRS's underlying component structure. A five-component solution emerged: unusual behaviors, social interaction, social proximity, perspective-taking, and rigid behaviors. T-scores for total severity of social symptoms and perspective-taking were computed. Undiagnosed participants were categorized based on their symptom severity: "healthy" for participants with T-scores below 65 and "clinical" for participants with T-scores above 65. Grouped by the severity of total social symptoms, both the healthy (Mdn = 27.00) and clinical (Mdn = 27.00) undiagnosed groups recalled more faces correctly than the group with ASD (Mdns = 21.50), $\chi 2$ (2) = 17,72, $p < .001$, but were less confident than the group with ASD, $\chi 2(2) = 27.25$, $p < .001$. Grouped by the severity of perspective-taking symptoms, the healthy undiagnosed group (Mdn = 27.00) performed significantly better on the facial memory task than the clinical undiagnosed group (Mdn = 24.50) and group with ASD (Mdn = 21.50), $\chi 2$ (2) = 33.18, $p < .001$. There was a significant difference in confidence, $\chi 2(2) = 31.06$, $p < .001$. The healthy undiagnosed group (Mdn = 2.51) was more confident than the clinical undiagnosed group (Mdn = 1.64), but less confident than the group with ASD (Mdn = 4.48).

Conclusion: Problems in perspective-taking were associated with facial memory accuracy in a group with ASD as well as a group of undiagnosed individuals with clinical severity of perspective-taking problems. Given the relationship between perspective-taking and facial memory, it may be possible to facilitate facial memory skills in individuals with ASD by implementing interventions that target perspective-taking skills or vice versa.

7. Rate of timely preventative care administration in the CINJ Sickle Cell pediatric population and comparison across income levels—A Quality Measurement Project

Yisha Cheng,[1] Elizabeth Castro,[1] Meika Neblett,[2] Archana Sharma,[1] Richard Drachtman.[1]

[1]Department of Pediatrics, Rutgers RWJMS, NJ; [2] Community Medical Center, Toms River, NJ

Purpose: To evaluate how well CINJ matches the standard of care for Sickle cell disease per National Heart, Lung, and Blood Institute guidelines, and identify whether income status affects timely care.

Method: Our study is a single center retrospective study which examined active CINJ sickle cell patients under the age of ten years old with visits between 2019-2021. Parameters were set based on National Heart Lung Blood Institute (NHLBI) guidelines, and examined timing to first hematology appointment, first transcranial doppler, penicillin start date, and hydroxyurea start date. Data is further analyzed by income approximated by the 2020 US census per capita income data based on township status.

Result: 55 (86%) of 64 sickle cell anemia patients were seen before or at two months of age. 25 (93%) of 27 patients with HbSS or HbSB0 seen before or at two months of age started penicillin before or at two months of age. 7 (21.9%) of 32 patients with HbSS or HbSB0 seen before nine months of age started hydroxyurea before or at nine months of age. 24 (92.3%) of 26 patients with HbSS or HbSB0 older than two years of age and seen before three years of age had the first TCD before the age of three. 4 (25%) of 16 patients with HbSS or HbSB0 seen from birth and older than three years old completed the full series of primary care.

Conclusion: Adverse social determinants of health remain a large concern within the sickle cell population given the burdens of chronic illness and often racial disparities. Despite not finding a trend in income status versus timing of care in our small study, we did identify a gap between the standard of care and our sickle cell patient population. Subsequent work is warranted in identifying the pitfalls in order to bridge the gap

8. Family or factory medicine? Diverse parents' perspectives on early relational health and the role of pediatric clinicians

David J. Cordoba, [1] Usha Ramachandran, [1] Erica Levin, [1] Daniel Lima, [1] Nikki Shearman, [3] David Willis, [2] Deepa Srinivasavaradan, [4] Manuel E. Jimenez, [1,5]

[1]Rutgers RWJMS, NJ; [2]Center for the Study of Social Policy, Washington, DC; [3]Reach Out and Read, Boston, MA; [4] SPAN Parent Advocacy Network, Newark, NJ; [5] Children's Specialized Hospital, NJ

Purpose: The American Academy of Pediatrics identifies safe, stable, and nurturing parent-child relationships as critical to mitigating the effects of toxic stress and endorses a paradigm shift toward promoting early relational health in pediatrics. Pediatric clinicians have a unique opportunity to promote early relational health, yet little work has sought parents' perspectives on how clinicians can do so in an effective manner. The objective of this study is to understand diverse parents' perspectives on early relational health and the role of pediatric clinicians in supporting it.

Methods: We conducted virtual focus groups using a guide prepared with input from community partners and parent advisors. We purposively sampled 29 parents of children age ≤ 7 years. Focus groups were recorded and transcribed verbatim. We analyzed data as it was collected and identified themes using standard inductive and iterative processes.

Results: Twenty-nine parents participated in 7 focus groups (median parent age: 36.0 years; 48.3% Asian, 17.2% Black/African-American; 37.9% Hispanic/Latino; 82.8% mothers). We identified 3 organizing themes based on parents' perspectives and experiences: (1) Parents identified time, attention, and open communication as laying a foundation for early relational health; (2) Pediatric clinicians are well positioned to promote early relational health, but disconnected parent-clinician
relationships are a major barrier; (3) Enhanced clinician communication and careful attention to child development and family wellbeing represent key opportunities to strengthen parent-clinician relationships.

Conclusion: Parents identified time, attention, and open communication as essential within their understanding of early relational health. While participants expressed openness to clinicians addressing early relational health in pediatric settings, such work is contingent on strong parent-clinician relationships. Policymakers and clinicians seeking to address early relational health in pediatric settings cannot assume parents will welcome these efforts without providing adequate time and intentionality to facilitate clinician-family relationship-building and careful attention from clinicians to address this critical topic

9. Spanish-speaking families use of telemedicine during the COVID-19 pandemic

Odeilis Dominguez, [1] Michael Lewis, [1]Margaret Whedon, [1]

[1] Institute for the Study of Child Development, Department of Pediatrics, Rutgers RWJMS, NJ

Purpose: Telemedicine use has more than doubled since the COVID-19 pandemic in March 2020, but there is limited research into the efficacy of using telemedicine in the field of developmental/behavioral pediatrics, particularly among families who are native Spanish speakers. We aim to identify potential barriers and advantages to using telemedicine among this population in the wake of a global pandemic.

Methods: Native Spanish-speaking parents of children (1 – 17 years, M = 8.86, 53% male) who have used telemedicine services were recruited from pediatric clinics in NJ (N = 158). Questionnaires were completed in person, over the phone, or electronically via a secure link. Recruitment and data collection were performed by bilingual research staff.

Results: Cultural background distribution: 47% (Mexico), 26% (other countries in Central America, 16% (Caribbean), and 11% (South America). More than half (65%) used telemedicine on occasion, and more than onethird (37%) used translator services nearly all the time. At least one advantage was reported (88%) and one disadvantage (73%). English proficiency was significantly correlated with translation services ($\rho = -.66$). It was also correlated with number of advantages ($\rho = .33$) and disadvantages ($\rho = -.24$) stated. Participants reporting COVID-19 exposure and/or death in their family were more likely to report using telemedicine than those who reported none (only significant at higher levels of English proficiency, $F = 15.62$, $p < .01$) (Figure 1). Participants who would continue using telemedicine had higher English proficiency than those who reported they would not ($W = 1816$, $p < .01$). Not having to drive and take off work were endorsed more often as advantages, and not having a physical exam or seeing the doctor in person were endorsed more frequently as disadvantages.

Conclusion: Findings underscore the need to better implement translation services in telemedicine for Spanish-speaking families who cannot fully benefit due to language barriers. Telehealth may be a tool to improve healthcare access for this population who already face multiple barriers

10. Educating pediatric residents on promoting positive parenting: A Statewide Collaborative Approach

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Purpose: Pediatric clinicians are well positioned to promote positive caregiver-child interactions which have been shown to result in better developmental and health outcomes in children. However, in a national survey of pediatric residency program directors, only 11% indicated that their program did "very well" in educating residents on this. Our objective was to improve resident skills in promoting positive parenting at all pediatric residency programs in New Jersey by leveraging the New Jersey Pediatric Residency Advocacy Collaborative (NJPRAC) and utilizing an online parenting curriculum.

Methods: Faculty and resident leaders recruited through the NJPRAC network from all 9 pediatric residency programs in NJ met quarterly from September 2020 to November 2021. The Keystones of Development (KOD) online curriculum, which teaches and promotes positive parenting, was implemented at all programs and supplemented with a webinar series featuring national experts. Resident pre- and post-surveys assessed knowledge, attitude, and behavior change. Feedback from faculty preceptors was obtained via focus groups.

Results:193 resident pre-surveys and 91 post-surveys were completed. 83.1% strongly agreed or agreed that the
curriculum is useful. Resident knowledge increased in all domains (significant increase in 7/10 domains). Confidence and self-reported behavior improved in discussing, modeling, and praising positive parenting behaviors (significant improvement in 17/21 skill areas). Barriers to promoting positive parenting decreased (significant decrease in 1/5 barriers). Focus groups with 14 faculty revealed 5 themes: residents' lack of comfort with addressing parenting behaviors, importance of education on facilitating parent-child relationships, improving connection with families, need for workflow updates to include parenting discussions, and opportunities to strengthen the curriculum.

Conclusions: The curriculum was resulted in significant improvements in knowledge, confidence, and behaviors in supporting positive parenting. The NJPRAC network enabled successful statewide implementation. Next steps include expansion of curriculum to other practicing professionals as well as study of feedback from patient caregivers.

11. Utilizing the LINK Survey to Identify Indices of Needs, Stress, and Potential Resiliency Factors for People Living with HIV/AIDS (PLWHA) during the COVID-19 Pandemic

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Purpose: PLWHA have experienced an increased burden of Social Determinants of Health (SDOH) during the COVID-19 pandemic. The LINK survey was utilized to identify indices of stress, needs and potential resiliency factors in this population during COVID-19.

Methods: The Local Inventory of Needs and Knowledge (LINK survey) was modified to address COVID-related stressors among PLWHA. Participants (n=100) completed the LINK survey (English or Spanish), May 2020-November 2021. Reliability was assessed using The Kuder-Richardson (K-R) Coefficient; responses were further stratified based on socioeconomic characteristics of the population.
Study participants were PLWHA from Robert Wood Johnson AIDS Program (n=77) or Eric B. Chandler Health Center (n=21). 54% were women; median age was 43.5 years; 49% were Black/African American, 28% Hispanic; 46% attended college; 41% were insured privately.

Results: The Needs Index (9 items) was reliable; K-R=0.84, mean=3.2, median=2, interquartile range=4. The Social Needs Stress Index (8 items) was reliable; K-R =0.82, mean=4.8, median=5, IQR=5. 83% reported at least one unmet need; 90% indicated stress related to at least 2 items within the Social Needs Stress Index. The COVID-19 Stress Index (12 clinical and social items) was reliable; K-R=0.87 median=7, IQR=7. 50% felt COVID-19 triggered a past stress, 50% felt stress keeping safe at home, and more than 60% reported stress due to social isolation and/or loss of routines. Privately insured individuals reported lower stress associated with medical
management ($p < 0.05$). Group differences were not found by race/ethnicity. Positive health/resiliency was best captured by 3 items (K-R=0.92), with 31% denying all 3 approaches and 53% utilizing all 3. Relational support was best represented in 2 items (K-R=0.90), with 37% reporting a social support system during the pandemic. 49% reported staying hopeful in difficult times.

Conclusions/Implications for Policy or Practice: Results show that unmet social needs and COVID-19 related stressors, as assessed by the LINK, are common and consequential in PLWHA. Positive health approaches did not appear to be protective in our population; however, resources addressing SDOH remain essential in the clinical management of PLWHA.

12. COVID-19 vaccine counseling competencies among students entering pediatrics

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Purpose: Pediatricians often encounter vaccine-hesitant parents. It is crucial that pediatricians can respond to concerns about vaccines especially the COVID-19 vaccine. Our objective was to measure the vaccine counseling abilities among 4th year medical students choosing a pediatric career at Rutgers-RWJMS, relative to the performance of students entering other specialties.

Methods: A standardized patient (SP) case portraying a patient skeptical of COVID-19 vaccination was developed. Students of all specialties (n=132) were evaluated on a scale of 1-5 using the Empathy and Compassion Rating Scale (ECRS) and vaccine knowledge measures; "5" indicated effective communication and "1" was unsatisfactory. Mean differences in ECRS and knowledge scores between students in pediatrics and those in other specialties were determined by analyses of variance (ANOVA) and independent T-tests.

Results: Students entering pediatrics performed similarly to those entering other specialties on all ECRS measures, but showed significant differences on several vaccine knowledge measures. The mean score among students entering pediatrics on describing the indications/contraindications for vaccination was 3.78, which was significantly lower than those of entering psychiatry (4.69, p=0.003), internal medicine (4.44, p=0.016), and surgery (4.34, p=0.043). In describing vaccination benefits, pediatric students scored lower than those same specialties. (4.92, 4.44, 4.53; p=0.0000336, p=0.025, p=0.00247 respectively). They scored a mean of 3.11 at describing the procedure, and 3.33 at describing risk of serious complications; these were significantly lower than the corresponding mean scores of surgery (4.05 and 4.13; p=0.0000452 and 0.002) and psychiatry students (4.23 and 4.30; p=0.000174 and 0.017 respectively).

Conclusions: Students entering pediatrics may have scored lower on vaccine knowledge measures than other students because the encounters took place in March 2021, when COVID-19 vaccines were not approved for children. How students entering pediatrics perform relative to peers of other specialties can inform targeted improvements in pediatric clinical education.

13. Unbound bilirubin levels exceed potential neuro-toxic thresholds in preterm infants receiving soy-based lipid infusion

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Purpose: Soy-based lipid infusion (SBLI) is essential in the nutrition management of preterm infants. The free fatty acid released from the SBLI competes with bilirubin for albumin binding sites. Previous investigation has demonstrated a dose-response relationship between SBLI dosage and unbound bilirubin (Bf) levels. However, we have not documented the proportion of these infants whose Bf levels exceeded a threshold of potential bilirubin-induced neurotoxicity. Bf levels above 11 nM, 17 nM, and 22 nM have been considered toxicity thresholds. This investigation aimed to examine the Bf levels in preterm infants receiving SBLI to ascertain the proportions of infants whose Bf exceeds a threshold of potential toxicity.

Methods: Preterm infants< 2.0 kg birth weight receiving clinically indicated SBLI (1-3 g/Kg/day) during the first week were the subjects of this study. TSB and Bf levels were obtained simultaneously by heel stick. TSB was measured using the diazo method and Bf by a dedicated fluorescent sensor. The proportion of Bf samples above designated potential levels of 11nM, 17nM, and 22 nM were observed.

Results: The study subject comprised 130 preterm infants (BW:1343± 439.7g, GA: 29.4± 3.2 weeks), in whom 375 samples were collected at various times determined by the dose of the SBLI. Bf levels were < 11 nM in 176 (46.9.0%). Over 11 nM of Bf were noted in 199 (53.0%) infants, with 80 (21.3%) above 17 nM, and 32 (8.5%) above 22 nM (Table). Without SBLI infusion, the mean Bf was 7.48+/-9.90 nM, with 3.3% > 11nm. The distribution of Bf levels at different SBLI infusions is noted in the Table.

Conclusions: Unbound bilirubin levels of preterm infants receiving soy-based lipid infusion frequently exceed a threshold of potential neurotoxicity, a source of hidden jeopardy for neurodevelopment.

Table. Peak Bf levels in preterm infants at different SBLI infusion doses SBLI infusion dose

SBLI Infusion Dose (g/kg/d)	SBLI Infusion Rate (g/kg/hour)	Bf ≤ 11nM	Bf >11 nM	Bf >17 nM	Bf >22 nM
0 (n=91)	0	88 (96.7%)	3 (3.3%)	0	0
1 (n=96)	0.041±0.007	48 (50.0%)	48 (50.0%) *	15 (15.6%)	5 (5.2%)
2 (n=91)	0.083±0.010	18 (19.9%)	73 (80.1%) *	29 (31.9%)	12 (13.2%)
3 (n=97)	0.132±0.014	22 (22.7%)	75 (77.3%) *	36 (37.1%)	15 (15.5%)
TOTAL (n=375)		176 (46.9%)	199 (53.1%)	80 (21.3%)	32 (8.5%)

*p<0.01 (Bf at different SBLI infusions compared to no infusion)

14. Psychosocial impact of the COVID-19 pandemic on immunosuppressed children, young adults and their families: Preliminary data from a single institution

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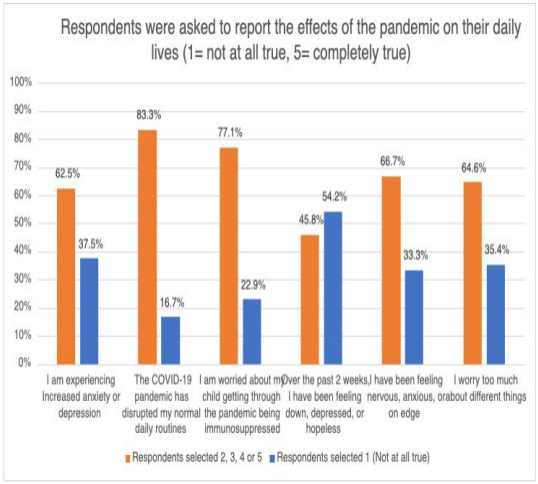
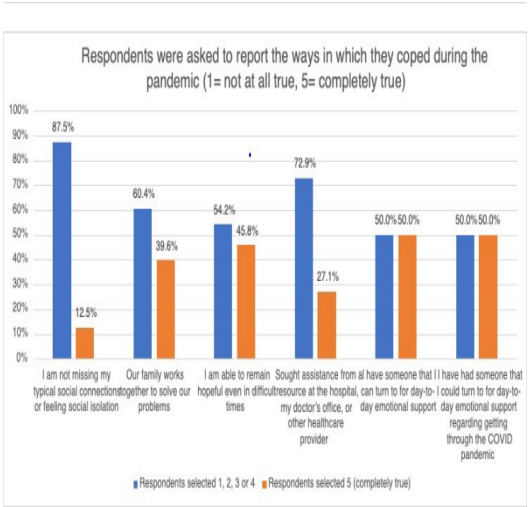
Purpose: COVID-19 has disrupted the lives of people worldwide. Immunosuppressed patients with autoimmune diseases (AID) are more susceptible to COVID-19 infection and complications. We examined the psychosocial impact of the pandemic on immunosuppressed patients and their families.
Methods: Young adults with AID and parents of children with AID competed the validated Local Inventory of Needs and Knowledge questionnaire with 5-point Likert responses ranging from "completely true (5)" to "not at all true (1)." Answers were dichotomized at the extremes based upon the framing of the question. Descriptive data is presented (Fig 1 and Fig 2).
Results: Forty-eight participants enrolled (25 young adults and 23 parents of children with AID). AID diagnosed included: lupus (n=12), juvenile arthritis (n=7), rheumatoid arthritis (n=7), nephrotic syndrome (n=6), multiple sclerosis (n=5), and other (n=11). Ages of participants with AID ranged from 2-25 years. A total of 30 participants (62.5%) experienced increased anxiety or depression, and 66.7% (n=32) felt nervous or on edge. Eighty three percent (n=40) experienced disruptions in their routines, and 77.1% (n=37) experienced worry regarding the impact of their immunosuppression on their ability to get through the pandemic. However, half reported being in excellent or very good health (50%, n=24). More than one quarter (27.1 %, n=13) sought assistance from various healthcare providers throughout the pandemic. Nearly 9 in 10 (87.5%, n=42) reported social isolation, with half (54.2%, n=26) reported feeling hopeless in difficult times, 50% (n=24) reported lacking emotional support to get through the COVID-19 pandemic, and 64% (n=29) felt they were unable to work together as families to solve problems.
Conclusion: A significant number of families experienced stress and lack of psychosocial support in the context of the COVID-19 pandemic. Exploring the psychosocial impact will help us in understanding their needs better

A)



B)



15. Impact of different definitions of Bronchopulmonary Dysplasia on its incidence and outcomes in preterm infants

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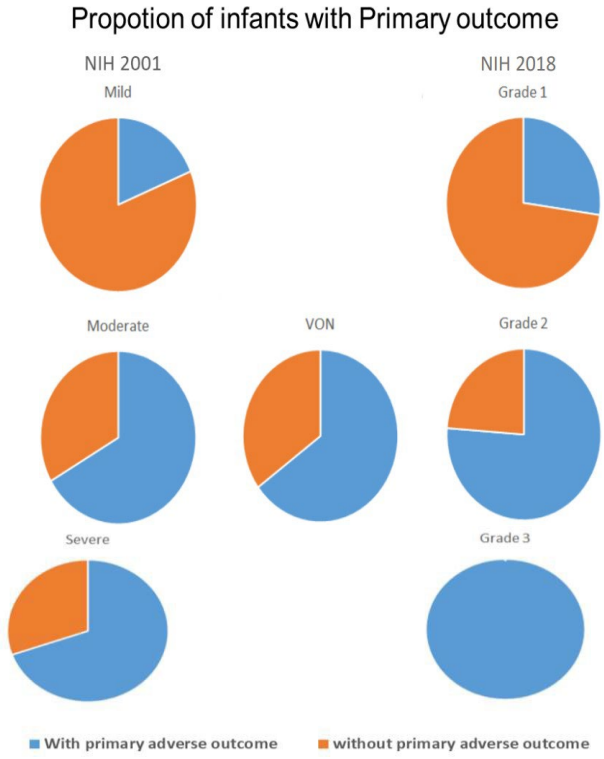
Purpose: The evolution in bronchopulmonary dysplasia (BPD) definition has reflected changing at-risk population and care practices. The impact of this evolution on the incidence of BPD and hospital outcomes is not known. The objectives of present study were to compare the three definitions of BPD namely Vermont Oxford Network (VON), NIH consensus definition in 2001, and NIH workshop definition in 2018; and to evaluate their association with in-hospital outcomes.

Methods: We conducted a retrospective cohort study of preterm infants of 23-30w GA born between 2016-20 at BMSCH who were diagnosed with BPD according to any of the three definitions. Inhospital outcome variables and co-morbidities were compared between different definitions. Primary outcome was defined as combination of either death, discharge on respiratory support, transfer to chronic care facility, or extreme length of stay defined as beyond 40w PMA.

Results: 51 preterm infants of GA of 26.2±1.6w and birth weight of 874±222g met the study criteria. While 27% of infants only met NIH 2001 criteria for BPD, all infants meeting the VON and 2018 criteria were also identified by NIH 2001 definition. The proportion of infants meeting primary outcome was similar between all three definitions (53%, 65%, 65% for NIH 2001, VON and NIH 2018 respectively). Multivariate logistic regression analysis confirmed strong association between NIH 2018 grading of BPD and in-hospital outcomes when compared to VON or NIH 2001 definitions (Figure 1) Interestingly, 19% of infants diagnosed with mild BPD according to NIH 2001 definition went on to have primary outcome.

Conclusion: While the latest severity based definition of BPD demonstrated strongest association with adverse in-hospital outcomes, a significant proportion of infants missed by both VON or NIH 2018 definitions had unfavorable outcomes. Long term implications of these results need to be explored.

Figure 1: Pie chart representing proportion of infants meeting primary adverse outcome according to VON, NIH 2001 and NIH 2018 definitions.



16. Perspective-taking and facial recognition on empathy and performance among adolescent camp staff

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Purpose: There is limited research on adolescent perspective-taking in relation to their ability to appropriately care for a child. Currently, there is a growing population of adolescents babysitting, working in a childcare setting, having younger siblings, or becoming parents themselves. With this in mind, it is important to identify how the ability to take the perspective of another, facial memory, and empathy may correlate with the success in caring for a child most appropriately. In a summer camp setting, we were able to explore the association among these variables, and further relate them to the formal camp evaluation of their care for children.

Methods: 32 counselors (17 male, 15 female) age 16-26 completed 2 self-reported, scaled surveys on (1) perspective-taking and (2) empathy, and each participant also engaged in a computerized facial memory task. In addition, scores were then analyzed in relation to an administrative evaluation of overall adolescent staff performance throughout the summer.

Results: There is a relationship between number correct in the facial memory task and the total administrative evaluation score ($R=0.48$, $p< 0.01$). Total correct is also positively related to how long each participant looked at faces ($R=0.40$, $p< 0.05$). Further, perspective-taking is positively correlated with empathy ($R= 0.41$, $p< 0.05$). However, perspective-taking and empathy are not related to facial recognition, nor are they related to the total evaluation score.

Conclusion: While a positive relationship was found between empathy and perspective-taking, the small sample size of the study thus far has not allowed us to draw further conclusions. However, by further understanding these scores, we can ensure children are receiving the best care possible and take measures to provide educational opportunities for improvement. Further, by examining the results of these measures, this will provide avenue for improvement with regard to perspective-taking and facial memory in adolescents so that they may make the correct choices when faced with difficult and vulnerable situations.

17. Gestational age at term and teacher-reported hyperactivity and ADHD symptoms

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Purpose: To estimate associations between gestational age (GA) and teacher-reported hyperactivity and ADHD symptoms at age 9 among children born at term (37–41 weeks).

Methods: A secondary data analysis of 1,410 children participating in a national U.S. birth cohort study was conducted. At age 9, students were evaluated by their teachers for hyperactivity and ADHD symptoms using the Conners Teacher Rating Scale–Revised Short Form. Unadjusted and adjusted Ordinary Least Squares (OLS) and logistic regression models of associations between GA and teacher-reported hyperactivity and ADHD symptoms were estimated and neonatal morbidities were explored as potential pathways.

Results: GA in weeks was significantly associated with lower teacher-reported hyperactivity and ADHD scores in unadjusted and adjusted models. Corresponding models using indicators for early-term (37–38 weeks) and late-term (41 weeks) versus full-term (39–40 weeks) instead of the continuous measure of GA indicated significant associations between early-term birth and higher scores on both scales (adjusted OLS coefficient: 0.868; 95% CI: [0.310–1.427] for hyperactivity, which is 24% above the sample mean; adjusted OLS coefficient 1.600; 95% CI: [0.556–2.643] for ADHD, which is 17% above the sample mean), but no significant associations between late-term birth and the scores on either scale. Neonatal hyperbilirubinemia was independently associated with hyperactivity symptoms but did not appear to be an important pathway.

Conclusion: The findings underscore the importance of GA, even at term, and add to growing evidence in support of the current recommendation for delaying elective deliveries to at least 39 weeks.

18. Spondylocostal Dysplasia and Brachydactyly associated with TBX6 and IHH variants: A case report.

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Purpose: To describe the first case report of spondylocostal dysostosis and brachydactyly with TBX6 and IHH variants.

Methods: Chart review through EMR was conducted and compiled. Consent was obtained from the parents.

Results: A Hispanic male neonate born at 36 weeks gestation to a 16-year-old primigravida by vacuum-assisted vaginal delivery. Apgar scores 9 and 9 at one and five minutes respectively. Pregnancy was uncomplicated. No family history of congenital anomalies. There was no history of consanguinity. Physical examination revealed a weight 2950 grams(50thcentile), length 45 cm(5thcentile), head circumference 34 cm(25thcentile). Anomalies found were: short trunk, short neck, low hairline, deformed ears, preauricular skin tag, penoscrotal transposition (PT),
palmar crease, short and broad fingers and toes(brachydactyly), hypoplastic and deep-set nails, metatarsal abductus, and cross-fused,small echogenic kidneys. Radiologic findings and genetic studies are consistent with spondylocostal dysostosis (SCD) and autosomal dominant brachydactyly. A high density of short runs of allele homozygosity (ROH) were observed and showed additional longer ROH on chromosomes 2, 5, and 16, consistent with a distantly related parental relationship. Invitae Skeletal Dysplasia Panel showed four significant variants related to the clinical findings; TBX6, DVA1, DLL3 and IHH.

Conclusion: We report a case of a neonate with TBX6, DVA1, and IHH variants associated with SCD and new associated phenotypes. We illustrate the use of the whole genome microarray and genomic sequencing analysis to identify the genetic etiology

19. Factor XI deficiency in a term neonate

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Purpose: To describe the hospital course of a full term neonate admitted to the NICU with congenital Factor XI deficiency.

Methods: Chart review through the Sunrise Clinical Medicine EMR was conducted and compiled. Consent was obtained from the mother.

Results: This is a 39 week and 5 day male infant delivered via vaginal delivery to a 24 year old mother. Mom is a carrier for Factor XI deficiency with c.403G4T (p. Glu135*) mutation. Infant delivered with vacuum assistance with APGARs 9 and 9 at 1 and 5 minutes, respectively. Initially transferred to newborn nursery but was transferred to NICU on DOL 2 due to large cephalohematoma and hemoglobin of 12.4mg/dL with concern for bleeding. Neurosonogram was done and unremarkable. CT head was then completed and showed several small areas of subdural hemorrhage and a scalp hematoma. Hematology was consulted and the infant was given 15mcg/kg of rFVIIa (NovoSeven). MRI brain on DOL 3 confirmed prior findings. NovoSeven was given for 6 days (titrated from every 6 hours to every 12 hours to daily every 2 days). Repeat MRI was done prior to discharge which showed no change from prior studies and the infant was discharged home.

Conclusion: This is a rare case of an infant presenting with Factor XI deficiency in the setting of maternal history and cephalohematoma. Factor XI deficiency is an autosomal recessive disorder with often severe disease common in Askenazi Jews. It shows a high variability in clinical phenotype. Most bleeding is secondary to trauma. Factor XI activity improves by 6 months of age. This case was important in that vacuum assisted delivery was done in the setting of known maternal carrier status with identification of the deficiency in the infant secondary to
cephalohematoma and maternal history

20. Prune Belly Syndrome Associated with Interstitial 17q12 Microdelation: a case report

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[1] Department of Pediatrics, Rutgers RWJMS, NJ.

Purpose: We present a rare association of prune belly syndrome (PBS) with newly reported genetic associations.

Methods: Chart review through EMR was conducted and compiled. Consent was obtained from the parents.

Result: A Hispanic male neonate born at 40 weeks' gestation to an 18 year-old primigravida by cesarean section. Apgar scores 9 and 9 at 1 and 5 minutes respectively. Prenatal ultrasound at 20 weeks' gestation revealed bilateral renal pelvis, ureteral and urethral dilation and thickened bladder with subsequent progression of hydroureteronephrosis. Genetic studies that were performed during the pregnancy showed 17q12 microdeletion, a de novo mutation. No significant genetic medical history. Physical exam, weight, length and head circumference were within 40-45th percentile. Anomalies at birth included: abdominal distention with thin, wrinkled and flaccid
abdominal wall and undescended testes. A foley catheter was placed and the infant was started on amoxicillin for urinary tract infection (UTI) prophylaxis. Imaging studies showed multiple anomalies including moderate-severe bilateral hydroureteronephrosis with grade 5 vesicoureteral reflux. MAG-3 renogram revealed bilateral obstruction. A scrotal ultrasound found testes in the mid abdomen. Nephrostomy tubes were placed after developing Enterobacter cloacae pyelonephritis despite prophylaxis. He was discharged to a subacute hospital pending pyelostomy and orchiopexy. He was prescribed daily oral amoxicillin for prevention of UTI. Whole genome SNP and microarray were performed showing interstitial deletion of chromosome 17(17q22.1 genes - ZNHIT3 to TBC1D3H) and interstitial duplication of chromosome 7(7q22.1 genes - NPTX2,
TRRAP,SMURF1,KPNA7,ARPC1a,ARPC1B,PDAP1,BUD31,PTCD1,CPSF4). There has been no report of clinically established disorders with duplication of this region.

Conclusion: To date there are few reported cases of PBS and associated chromosomal abnormalities. We report a new case of PBS associated with 17q12 microdeletion. Our report supports that screening for mutations/deletions on chromosome 17q12 could help identify the patients with PBS and improve the treatment of this rare disease.

21. Relationship between race, ethnicity, and time to diagnosis of Juvenile Idiopathic Arthritis

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Purpose: To determine if Black or Hispanic/Latinx children have longer times to JIA diagnosis than non-Hispanic White children.

Methods: This retrospective cohort study was performed using the CARRA registry, a multisite North American registry containing sociodemographic, clinical, and patient/caregiver-reported data on patients with pediatric onset rheumatic diseases. Eligible subjects had JIA, lived in the US, and had complete data on race, ethnicity, and dates of symptom onset and diagnosis. We compared time to diagnosis among children based on race and ethnicity using Wilcoxon rank-sum testing and multivariable Cox regression adjusted for age, sex, insurance type, self-reported household income, highest parental education attained, JIA type, calendar year of diagnosis, presence of uveitis, as well as zip code-based measures of residence (Rural Urban Commuting Area [RUCA] codes) and socioeconomic disadvantage (Area Deprivation Index [ADI]).

Results: Of 9,037 US patients with JIA in the registry, 6,527 eligible subjects (72%) were included in analyses. Most subjects (5,419, 83%) were non-Hispanic White, 785 (12%) were Hispanic/Latinx, and 323 (4.9%) were non-Hispanic Black; these groups differed in various baseline characteristics (Table). Compared to non Hispanic White subjects (median time to diagnosis 112 days, interquartile range [IQR] 54-286), the median time to diagnosis was higher in Non-Hispanic Black subjects (156 days, IQR] 62-365, P=<0.01) but not Hispanic/Latinx subjects (117 days, IQR 56-304, P=0.59). After adjusting for demographic, clinical, residential, and socioeconomic potential confounders, non-Hispanic Black subjects had a significantly longer time to diagnosis than non-Hispanic White subjects (HR 0.84, 95% confidence interval 0.74, 0.96).

Conclusion: In a large US cohort, non-Hispanic Black children and youth with JIA were more likely to experience delays in diagnosis independently of clinical, geographic, and socioeconomic factors. These delays appear to reflect racial disparities that may contribute to higher levels of JIA severity at diagnosis and worse outcomes. Future research should examine the key factors driving these racial disparities in JIA diagnosis and ways to address them.

22. Mitochondrial permeability transition in the evolution of neonatal hypoxic-ischemic brain injury

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Purpose: Activation of mitochondrial permeability transition (mPT) has been implicated in the evolution of post ischemic brain injury. Inhibition of mPT was demonstrated to be neuroprotective in adult hypoxic-ischemic (HI) brain injury. However, in contrast to the mature brain, the same strategy failed to protect neonatal HI-brain. Heredetermined if mPT activates and contributes to cellular death during reperfusion after the neonatal HI.

Methods: In neonatal (p10) mice subjected to the Rice-Vannucci model, at the end of HI (no reperfusion), at 30 minutes and at four hours of reperfusion, the ischemic hemisphere underwent mitochondrial isolation, electron microscopy (EM) and immunostaining for activation of caspase-3, a loss of microtubule associated protein 2 (MAP2) and nuclear pyknosis. Separate cohorts were exposed to hypothermia (HT, rectal t = 30-32°C) for the initial 30 minutes of reperfusion and 30 minutes of rewarming to a rectal t = 37°C or recovered under normothermia (NT, rectal t = 37°C). Excised patch-clamp was used to test inner mitochondrial membrane for mPT activation.

Results: mPT activation was detected in NT mice at 30 minutes of reperfusion but not in naives and that of prior-to reperfusion. EM of the same mitochondria showed only minimal swelling, and no cellular damage was detected by immunostaining. At 4 hours of reperfusion, mitochondria lost their matrix integrity. Extensive cerebral injury evidenced by the loss of MAP2, nuclear pyknosis, but without extensive caspase 3 activation, was detected in the tissue at 4 hours of reperfusion. Compared to NT-mice, HT-mice exhibited preserved mitochondrial electrical conductance and significantly decreased extent of their brain injury.

Conclusion: Neonatal HI-reperfusion injury results in mPT activation within 30 minutes of reperfusion that precedes histopathological signs of cellular damage. Prevention of mPT activation by the neuroprotective hypothermia highlights contribution of this event to HI brain injury.

23. Stress amongst fellows in the pediatric hematology/oncology job search

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Purpose: The landscape of the Pediatric Hematology/Oncology (PHO) workforce has evolved in recent decades. While fellowship positions nearly doubled for two decades, interest in the subspecialty has waned, with 44% of PHO programs going unfilled in 2020. A dearth of desirable PHO jobs for graduating fellows could be to blame, but objective evidence is lacking. In this study, we evaluated the perceptions of the current PHO fellows and leaders about the experience of seeking an initial faculty position and its impact on fellow stress and anxiety.

Methods: An anonymous electronic survey assessed demographics, job search experiences including facilitators and obstacles, and emotional health outcomes. Following pilot testing, in June 2021 all PHO division chiefs and fellowship program directors were invited to complete the Qualtrics survey and to disseminate the link to their fellows. Descriptive statistics and two-tailed P-values using Fisher's exact test were computed for statistical analysis.

Results: Forty-nine out of 74 programs (66%) responded, and a total of 162 surveys (79 fellows, 83 faculty) were completed. Fellows, more so than faculty, perceived that fellows were struggling to find post-fellowship jobs (87% versus 72% respectively, P=0.0198). However, faculty were more likely than fellows to perceive that fellows are either "extremely stressed" or "stressed" due to the job search process (95% versus 75% respectively, P=0.0003). Almost 50% of fellows reported anxiety on "more than half the days" due to the job search. Over 50% reported difficulty finding jobs that aligned with their ideal goals. By June 2021, 30/44 (68%) candidates had been offered a position, and 24/30 (80%) had accepted a position. Respondents leveraged online listings, program leadership, and word of mouth to identify available jobs. Common barriers in the job search included geographic constraints (N=26, 59%) and partner employment (N=19, 24%). The majority (N=36, 82%) felt that COVID-19 had impacted the job search. Respondents identified unmet educational needs including career development tools (N=46, 58%), early mentorship (N=19, 24%), and centralized job listings (N=16, 20%).

Conclusions: The perception of difficulty and stress regarding the post-fellowship job search is endorsed by most fellow candidates and their program leadership. Interventions to improve the efficacy and subjective experiences of fellows seeking their initial faculty positions are needed. These data highlight unmet educational needs among PHO fellows. Future steps include establishing career development resources to better prepare graduating fellows for the job search.

24. Gaps in adolescent and young adult oncology education during medical and pediatric hematology/oncology fellowship training.

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Purpose: There are limited data on the extent of adolescent and young adult (AYA) education in pediatric and medical oncology fellowship programs. The purpose of this study was to assess the prevalence and content of AYA-focused training during pediatric and medical oncology fellowship and identify knowledge gaps for targeted educational curricular development.

Methods: An anonymous, web-based survey for educators and trainees was developed, piloted and optimized by a study team comprising pediatric and adult oncologists. The survey contained questions on respondent demographics, AYA curriculum, provider comfort in managing specific AYA care domains, and priorities for future AYA educational content. In October 2021, email invitations containing the survey link were sent to program directors (PDs) and associate program directors (APDs) at 251 hematology/oncology fellowship programs (with 119 pediatric and 178 adult PDs/APDs) identified through the American Medical Association's Fellowship and Residency Electronic Interactive Database Access. PDs were asked to participate and also distribute the survey to current fellows. The survey remained open for 3 months. Fisher's exact test was used to assess for associations between discrete variables including amount of current education vs level of importance and demographic groups.

Results: Respondents represented 69 programs (27%). There were 130 respondents who completed curriculum and demographic questions and 112 who completed detailed topic questions.
Respondents comprised 51 PDs/APDs (32 pediatric and 19 adult) and 58 fellows (33 pediatric and 25 adult). 85% of PDs (44/51) do not have a formal AYA curriculum. Of these, 80% (35/44) offer some topic-specific lectures, while 20% (9/44) provide little/no education in any topics. For nearly all topics, at least 45% of respondents reported little/no education. Although onco-fertility and survivorship are the most frequently taught topics, 36% and 42% of respondents, respectively, reported little/no education in these areas. Substance abuse is least commonly taught. Both PDs and fellows believe that AYA topics are more important for inclusion in future curricula despite how infrequently they are currently taught (very/extremely important for inclusion vs moderate/great deal of current amount of education, $p = 0.0001$ for all topics). Overall, respondents indicated the most important topics for inclusion in fellowship curriculum were onco-fertility (82%), survivorship (78%), and communication (77%).

Conclusions: These data highlight the large gap in hematology/oncology fellowship education in AYA topics and a paucity of formal educational curricula. Efforts are needed to provide both medical and pediatric oncology fellows with the knowledge and skills required to provide optimal care for AYAs.

25. Impact of social media on the emotional health and burnout of pediatric and adult oncology professionals: A SWOG and COG survey.

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Purpose: Social media (SoMe) engagement is common in oncology, especially for patients and support groups, allowing for education and support. However, the impact on oncology professionals remains unknown. The purpose of this study was to evaluate professional SoMe use and its potential associations with wellbeing and burnout.

Methods: An electronic survey was developed and piloted by pediatric and adult oncologists. Questions included demographics, details of SoMe use, and emotional health assessments including a 2-item burnout questionnaire. The survey was distributed to all members of SWOG Cancer Research Network and Children's Oncology Group via Qualtrics. Data was analyzed as of 2/6/2022.

Results: The initial survey demographic and emotional health questions were completed by 1558 individuals. Of these, 1069 (68%) reported not using SoMe professionally, while 489 (31%) did. SoMe engagers were primarily female, born 1976–1984, attendings, from academic institutions, and balanced across adult and pediatrics (Table). Among those who use SoMe professionally, 54% (267/489) reported burnout, compared to 66% (701/1069) in the non-SoMe group ($p = 0.0001$). Remaining emotional health outcomes were similar between groups: choosing this job/career again, time for personal/family life, and career satisfaction ($p > 0.1$ for all). An additional section on the impact of SoMe on emotional health was completed by 473 SoMe engagers. While 49% (233/473) reported that SoMe has no impact on burnout, 18% (86/473) felt that SoMe helps alleviate burnout. SoMe use was reported to have somewhat/extremely positive impact on wellness (defined as physical, mental, emotional, spiritual wellness) by 28%(131/473). Networking and recognized shared experiences were the top areas of SoMe that improved wellness. Close to half (208/473, 44%) responded that SoMe does not negatively impact wellness. Professional anxiety, amount of time spent online, and keeping up to maintain an online presence were the most frequently noted aspects that negatively impact wellness. Nearly half (232/473, 49%) somewhat/strongly agree that SoMe provides a sense of community. One limitation includes distribution to engaged cooperative group members which may impact results.

Conclusions: This analysis suggests that social media engagement might help provide a positive impact on the wellness and reduce burnout among oncology professionals. We hope to further explore themes with qualitative interviews to better understand the impact of SoMe on our emotional health. Our goal is to develop educational interventions based on these salient positive and negative factors.

	No SoMe (n = 1069)	Yes SoMe (%) n = 489
Female (%)	78%	72%
Born 1976 – 1984 (%)	27%	50%
Role: Attending Physician (%)	35%	45%
Practice Type: Academic Institution (%)	74%	75%
Field: Adult Oncology (%)	33%	41%
Pediatric Oncology (%)	54%	41%
Other (%)	13%	17%

26. Patterns of relapse after immunotherapy in patients with high-risk neuroblastoma.

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Purpose: While the addition of anti-GD2 immunotherapy led to improvement in outcomes in patients on the Children's Oncology Group (COG) ANBL0032 study, relapse remains a concern. Prior studies demonstrated the prognostic importance of time to first relapse, however, the effect of immunotherapy on timing and patterns of relapse in neuroblastoma (NBL) have yet to be evaluated. The purpose of this exploratory analysis was to describe the impact of immunotherapy on patterns of relapse in patients with high-risk NBL, including a descriptive comparison of sites of relapse based on post-consolidation treatment received [dinutuximab with cytokines and isotretinoin (DIN) vs isotretinoin alone (ISO)].

Methods: A retrospective, descriptive analysis of patients on ANBL0032 was performed, including patients randomized to DIN or ISO and those non-randomly assigned to DIN after ISO arm closure. Pt characteristics including age, stage, MYCN amplification status, tumor grade, mitosis-karyorrhexis index (MKI) and ploidy were summarized descriptively and relapse sites were tabulated. For DIN patients who subsequently relapsed, overall survival (OS) was calculated starting from the time of first relapse after enrollment on ANBL0032 ("post-relapse OS"). KaplanMeier OS curves were generated based on site of relapse.

Results: The analytic cohort included 1,431 (DIN = 1,327; ISO = 104) patients. Among DIN patients, 492 relapsed, many in > 1 site. In the randomized cohort (n = 248), 122 relapsed (DIN = 68/144; ISO = 54/104). The frequencies (DIN; ISO) by site of relapse in the randomized cohort were: bone (53%; 54%), CNS (16%; 11%), lymph node (13%; 17%), abdominal (10%; 17%), paraspinal (6%; 2%), liver (3%; 4%), other soft tissue (22%; 7%). A higher proportion of ISO patients had marrow relapse (29.4% DIN; 48.2% ISO); however, the proportion of DIN patients with lung relapses appeared higher (9% vs 2%). Among all relapsed patients, the proportion with bone relapse did not appear to differ between treatment groups, regardless of MYCN status. Among patients with MYCN amplified disease, the proportion with marrow relapse did not appear to differ based on treatment [21/149 (14.1%) DIN; 3/20 (15.0%) ISO]; however, among patients with MYCN non-amplified disease, the proportion with marrow relapse appeared higher in the ISO group [16/23; 69.6%] vs the DIN group [52/193 (26.9%)].

Conclusions: In this exploratory analysis of patients on COG ANBL0032, the pattern for site of relapse appears to differ between patients treated with DIN vs ISO. While immunotherapy remains the treatment of choice in this population, the findings from this retrospective exploratory analysis warrant further investigation to decrease the risk for post-immunotherapy relapse.

27. Sudden Unexpected Infant Death diagnostic codes in the first hour of life

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Purpose: Following a decline in Sudden Unexpected Infant Death (SUID) in the 1990s in association with the safe infant sleep policies of the American Academy of Pediatrics, US rates have stagnated. SUID is comprised of deaths under one year of age to Sudden Infant Death Syndrome, Ill-defined or unknown causes, or Accidental Suffocation and Strangulation in Bed, ICD 10 codes of R95, R99, and W75, respectively. The US SUID rate has remained stable at 0.94 and 0.91 per 1,000 live births, respectively, for 2000 vs. 2018. Hypothesized contributions to national rate stagnation include adverse social and health determinants and challenges to compliance with safe sleep. A less explored area is whether there are misapplications of SUID diagnostic codes. Study aims to examine SUID coding applied to infant deaths in the first hour of life across gestational age (GA) groups.

Methods: Using CDC linked birth/infant death files for 2007-2018, we identified SUID in the first hour of life and determined what percentage were to infants with a GA<23, 23-27, 28-31, 32-33, 34-36, and >37 weeks. We also examined delivery methods.

Results: SUID in the first hour of life accounts for 0.6% of all cases. Of these 279 early SUID deaths, GA was available for 268: 44.4% were under 23 weeks GA, (ranging from 17 to 22 weeks), declining thereafter but rising again in term infants. SUID in the first hour in infants with a GA > 34 weeks were more likely to have had a Cesarean birth, in contrast to all births in the same era and GA grouping. (47.5% vs. 31.6%, respectively)

Conclusion: Although SUID in the first hour is rare, potential misapplications of coding, particularly in deaths with a GA under 23 weeks, may have contributed to a spuriously sustained rate of SUID over decades.

28. Intersensory integration in infants with autism spectrum disorder

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Purpose: Audio-visual speech perception is a process that may be critical in infants for developing social cues and adaptive behavior. Studies have shown how children and adolescents with neurodevelopmental conditions such as Autism Spectrum disorder (ASD) are associated with cognitive deficits that could hinder their audio-visual speech perception and, subsequently, their social development. This study examined two groups of infants' (TD and AtRisk) sensitivity to audiovisual synchrony and aims to further understand how audiovisual sensitivity influences social behavior.

Methods: To measure infants' sensitivity to audiovisual synchrony, subjects at 4-5 months of age sat in front of two screens playing a video of a woman articulating the syllable /ba/. On the matching screen, the audio matched the women's lip movement. On the other discrepant screen, the same video was presented at increasing levels of audio-visual delays (333 ms, 500 ms, 666 ms, 833 ms, and 1000 ms). A second experiment procedure consisted of a mother baby Free Play interaction for 3 minutes. We tracked and quantified both the number of seconds the infant spent looking at each screen and the percentage of Free Play period the baby gazed at the mother.

Results: A correlation analysis was conducted to determine the relationship between the audio-visual delay for which subjects spent the most time looking at the matching screen and the mean percentage of total 3 minutes that the baby spent looking at the mom. For TD subjects there was no correlation between the two variables $r = -0.0213$, $n = 53$. For subjects At-Risk for ASD, there was a positive correlation between the two variables $r = 0.49$, $n = 18$.

Conclusion: At the developmental stage of 4-5 months, TD subjects' audiovisual sensitivity had no correlation to the amount of time they gazed at their mother. At-Risk subjects demonstrated a moderate correlation between audiovisual sensitivity and gazing at their mother.

29. Housing affordability and severe maternal morbidity

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Purpose: To estimate associations between municipal-level housing costs and severe maternal morbidity (SMM) and the potential buffering role of publicly supported affordable housing.

Methods: This cross-sectional study of 1,004,000 births in New Jersey from 1/1/2008-12/31/2018 used birth records linked to hospital discharge records and municipality-level measures to estimate multilevel logistic models of associations between municipal-level rental costs relative to income (housing cost burden) and SMM, as well as the extent to which availability of publicly supported affordable housing attenuated those associations.

Results: Higher municipal housing costs were associated with greater odds of SMM, particularly among mothers with low education, and availability of affordable housing attenuated the associations. Controlling for rent burden and other characteristics, a $1,000 increase in annual municipal-level housing subsidy per person below poverty was associated with 8% lower risk of SMM among mothers with < high school education, which could reduce the educational disparity in SMM by 20.7%.

Conclusions: Living in a municipality with higher housing cost burden was associated with higher odds of SMM, and greater availability of publicly supported affordable housing attenuated the association. The findings point to provision of affordable housing as an actionable strategy for potentially improving maternal health and reducing SES disparities in maternal health.

30. Small-for-Gestational-Age at Term and Cognitive Test Scores at Age 9

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Purpose: To estimate associations between SGA and cognitive test scores at age 9 among children born at term (37–41 weeks) in a US sample using traditional and alternative measures of SGA.

Methods: A secondary data analysis was conducted on samples of 1,530 and 2,144 children born in 1998–2000 and participating in a national US birth cohort study. The Peabody Picture Vocabulary Test (PPVT) and Woodcock-Johnson Passage Comprehension (WJ9) and Applied Problems (WJ10) tests were administered to the children in person. Unadjusted and adjusted Ordinary Least Squares and logistic regression models of associations between SGA and test scores were estimated using traditional and alternative measures of SGA.

Results: SGA was associated with 2–4-point lower cognitive test scores and 1–2 times higher odds of scores <85 (>1 standard deviation below the national mean) across most measures of SGA, percentile cutoffs, and outcomes. E.g., for WJ10, last menstrual period (LMP)-based SGA was associated with 2.5-point (95% CI: -4.625, -0.400) and 3.1-point (95% CI: -5.857, -0.353) lower scores using 10th and 5th percentile sex-specific cutoffs, respectively, and SGA based on clinical assessment was associated with scores <85 using a 5th percentile cutoff (OR: 1.811; 95% CI: 1.129, 2.904).

Conclusion: The findings validate and update the sole comparable previous study of SGA at term and cognitive outcomes in the US (of children born 1959–1966) and provide robust evidence that term SGA children should not be overlooked when targeting early interventions that could potentially improve cognitive functioning in school.

31. Machine learning for detection of correct peripherally inserted central catheter tip position from radiology reports in infants

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Purpose: In neonates, the position of a peripherally inserted central catheter (PICC) must be confirmed frequently, as the tip may move from its original position and run the risk of damage. Automated detection of PICC tip position holds great promise for alerting bedside clinicians to noncentral PICCs. This research seeks to use natural language processing (NLP) and supervised machine learning (ML) techniques to predict PICC tip position based primarily on text analysis of radiograph reports from infants with an upper extremity PICC.

Methods Radiographs, containing a PICC line in infants under 6 months of age, were manually classified into 12 anatomical locations based on the radiologist's report of the PICC line's tip. After categorization, we benchmarked the performance of seven different (neural network, support vector machine, the naïve Bayes, decision tree, random forest, AdaBoost, and K-nearest neighbors) supervised ML algorithms.

Results A total of 17,337 radiographs met criteria for inclusion and were labeled manually. Interrater agreement was 99.1%. Support vector machines and neural networks yielded accuracies as high as 98% in identifying PICC tips in central versus noncentral position (binary outcome) and accuracies as high as 95% when attempting to categorize the individual anatomical location (12-
category outcome).

Conclusion Our study shows that ML classifiers can automatically extract the anatomical location of PICC tips from radiology reports. Two ML classifiers, support vector machine (SVM) and a neural network, obtained top accuracies in both binary and multiple category predictions. Implementing these algorithms in a neonatal intensive care unit as a clinical decision support system may help clinicians address PICC line position.

32. COVID-19 pneumonia in a 10-day old full-term infant

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Purpose: To describe the hospital course of a 10-day old full-term infant admitted to the NICU in acute respiratory failure secondary to COVID-19 pneumonia.

Methods: Chart review was conducted using the Sunrise Clinical Medicine EMR.

Results: A 10-day old 3.6kg 41+1 GA male born via vaginal delivery to a 32-year-old G3P2 with an unremarkable prenatal course, and uncomplicated delivery and hospital stay. On day of life 10, the infant was sent to the ER for tachypnea and decreased oral intake. Siblings reported to have upper respiratory viral symptoms, but no testing was completed, while mother and father tested negative for COVID-19. In the ER, CXR showed bilateral perihilar infiltrates and COVID-19 test was positive, and negative for other respiratory viruses. In the NICU, the infant required CPAP and a septic workup was performed. CBC, CMP, CRP were within normal limits. LDH, Ferritin, Troponin were elevated. An echocardiogram was unremarkable. The patient was treated with Remdesivir for five days. The infant responded well and was weaned to HFNC 2L and transferred to Pediatric Inpatient floor. On Hospital Day 13, the infant developed worsening respiratory distress with increased oxygen requirement and required transfer to PICU for treatment with HFNC 8L. The infant was started on a 5-Day course of dexamethasone and weaned back to RA on Hospital Day 18.

Conclusion: This is a unique case of a 10-day old infant with COVID-19 pneumonia who presented with acute respiratory failure. Hospital course demonstrated a biphasic disease course and resolution of symptoms 19 days after treatment with Remdesivir and dexamethasone. Labs demonstrate elevated markers of inflammation and COVID+ PCR, but otherwise unremarkable. To our knowledge, this is the smallest (by weight) infant treated with Remdesivir and provides some insight into the course of COVID19 pneumonia in a neonate.

33. The role of early temperament and environmental risk on adolescent aggression

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Purpose: Temperament, prenatal substance exposure, and environmental risk (ER) may predict antisocial behavior (AB) in adolescence. The current study is the first to examine these risk factors in relation to the subtypes of person-centered vs. property-centered AB.

Methods: 126 mother-child dyads participated in a longitudinal study. Prenatal cocaine exposure was assessed by maternal interview and confirmed by meconium assay. Temperament dimensions (anger, impulsivity, inhibitory control, soothability, and sensation seeking) were assessed by mothers at 7-years using the Children's Behavior Questionnaire. Harsh parenting was assessed by mothers using the physical punishment and psychological aggression subscales of the Parent-Child Conflict Tactics Scale at four and five age years of age. Maternal depression was assessed using the Beck Depression Inventory at 15 years. In addition, an ER composite of family stress, maternal social support, poverty, minority status, single parenthood, maternal education, number of caregivers and stability of the child's surroundings was administered at nine time points throughout childhood/adolescence. AB (person-centered; property centered; and aggressive personality) was assessed at 16 years from items reported by adolescents (Youth Self Report; Self-Reported Offending Scale; Reactive Proactive Aggression Scale, RPAS) and mothers (Child Behavior Checklist; RPAS).

Results: Temperament predicted all three AB outcomes as rated by mothers, but only one (people-centered) rated by adolescents in block 1 of hierarchical regressions. In block 2, harsh discipline predicted greater person-centered AB and a more aggressive personality as rated by adolescents. In contrast, maternal depressive symptoms predicted more property-centered AB and aggressive personality per mother ratings. Prenatal cocaine and tobacco exposure did not predict AB.

Conclusion: Environmental risk factors are greater predictors of AB during adolescence than are prenatal substance exposures. In addition, the source of AB ratings need to be considered as harsh discipline predicted only adolescent ratings, whereas maternal depressive symptoms predicted only mother ratings of AB. Implications for future research and clinical practice are discussed.

34. A scoping review of Reach Out and Read implementation in pediatric settings

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Purpose: Reach Out and Read (ROR) is an evidence-based literacy promotion intervention that leverages near universal access to children in primary care to promote optimal child development. While several studies document ROR's effectiveness, ROR implementation remains understudied. This scoping review examines the existing literature to better understand ROR implementation.

Methods: We included peer-reviewed English-language papers focusing on ROR in a pediatric ambulatory setting in North America. Extracted variables included publication year, title, author(s), intervention location, sample size, number of clinics, study design, study aim, ROR implementation, modifications, intervention assessment, barriers, facilitators, and outcomes.

Results: 73 papers were included, of which 45 were research articles. We identified variation in implementation, including differences in ROR components delivered. More than half of the research articles did not assess ROR implementation. The most common barriers to ROR implementation were at the system level (i.e., financing and inadequate time). Modifications and enhancements to ROR are emerging but most address barriers at the clinician and family level.

Conclusion: ROR implementation varies across existing studies and many did not assess implementation. Consistent reporting and assessment of implementation could create opportunities to better understand the mechanisms underlying ROR's effects and inform other early childhood interventions that seek to promote optimal development at the population level.

35. Adrenocortical reactivity to social evaluative threat and internalizing symptoms in adolescence: The role of negative self-evaluation.

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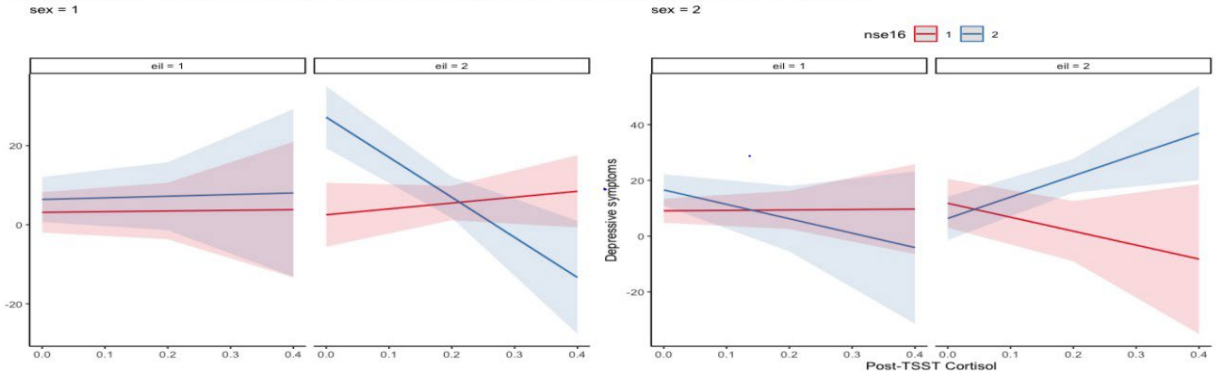
Purpose: Adrenocortical reactivity to social evaluative threats may contribute to internalizing problems in youth. In young children, cortisol reactivity following task failure is only observed among those who express negative self-evaluative (NSE) emotions (e.g., shame), suggesting they may play a role in the body's physiological response to stress. However, few studies have investigated the relation of NSE to cortisol reactivity in adolescence,

Methods: Adolescents (N = 106, M = 16.9, 50% male) completed the Trier Social Stress Test (TSST). Before and after the TSST, cortisol was collected and youth reported on their emotional state with the PANAS; a factor analysis revealed three factors (Joy, Fear, NSE). Youth reported on their internalizing symptoms with the Beck Depression Inventory and Youth Self-Report. Interactions tests and latent change score models were conducted to assess the relations between change in cortisol and NSE (controlling for initial levels) and internalizing symptoms.

Results: NSE after the task is positively associated with internalizing symptoms when youth have higher initial cortisol, F(3, 100) = 9.50, p <.01. When youth have higher initial cortisol, the relation between cortisol after the TSST and internalizing is significant when youth also expressed NSE, F(15, 85) = 4.56, p < .01, R2 = .45, however, the effect is in opposite directions for males and females (Figure 1). For females, higherinitial cortisol is associated with greater increases in NSE, and indirectly with less recovery in cortisol (Figure 2), but cortisol and NSE are not significantly associated for males (Table 1).

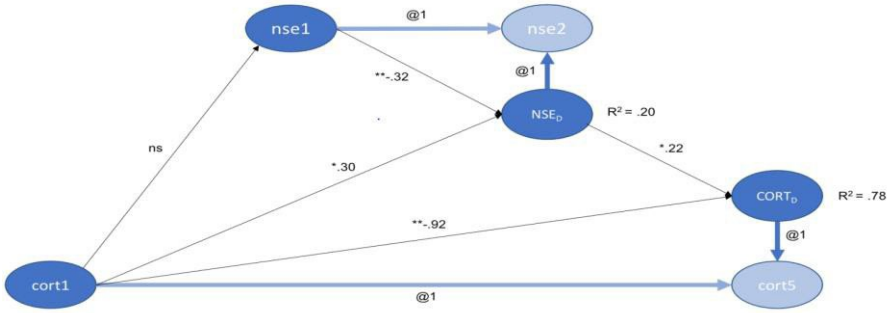
Conclusion: Findings suggest that NSE plays a role in the adrenocortical response to social evaluative threat in adolescents. Additional research is needed to better understand sex differences and the relation to internalizing symptoms.

Figure 1. Interaction of initial cortisol, post-stressor cortisol, NSE and sex in the prediction of depressive symptoms



Note: overall $F(15,85) = 4.96$, $p < .01$, $R^2 = .46$; for males (sex = 1, left half-side) with elevated initial cortisol (eil = 2, blue line) who expressed NSE (right inner panel), the relation between post-stressor cortisol (cort5) and depressive symptoms is significantly negative; for females in this regard, the relation is positive; associations between post-TSST cortisol and depressive symptoms are not significant for youth (male or female) who do not express NSE (n = 48%).

Figure 2. Associations between initial levels and change in cortisol and negative self-evaluation for females



Note: Model fit: $X^2 = 3.42(3)$, $p = .33$, CFI = .99, RMSEA = .05; $^{**}p < .01$, $^{*}p < .05$; initial cortisol is not significantly associated with initial NSE but is positively associated with the change in NSE from pre to post, such that when initial cortisol levels were greater, girls reported greater NSE after the task, controlling for initial levels; additionally, the change in NSE is positively associated with the change in cortisol such that greater increases in NSE were associated with less recovery of cortisol.

36. Cardiac vagal regulation during a social performance challenge and depressive symptoms in adolescence: The role of positive affect.

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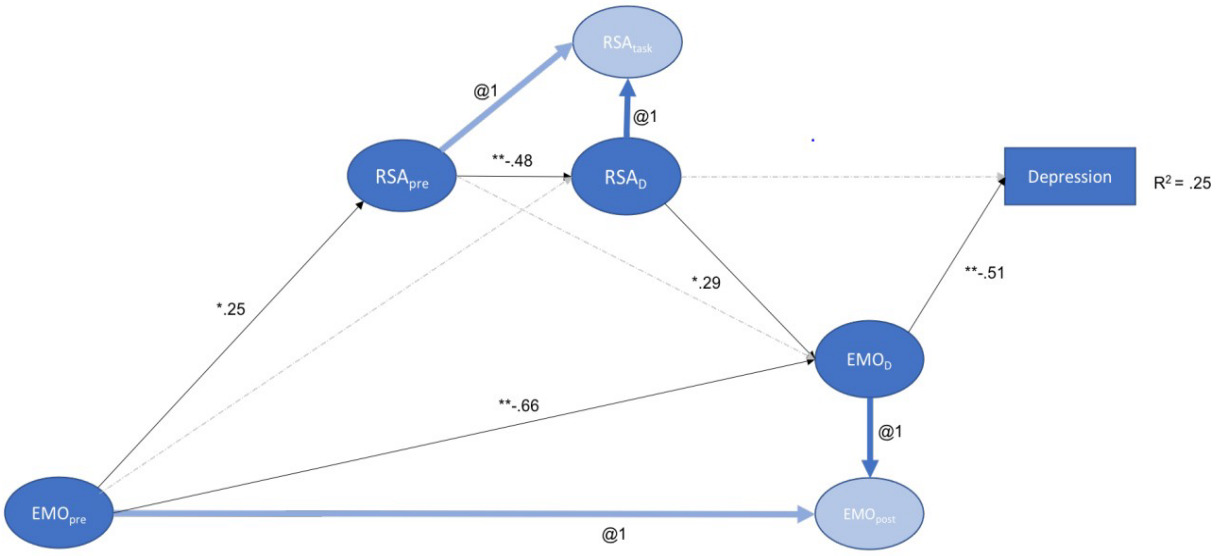
Purpose: Cardiac vagal tone, a measure of PNS influence on the heart, is thought to play an important role in emotion regulation. The purpose of this study is to investigate whether positive affect represents a mechanism through which cardiac vagal regulation during a social performance challenge is associated with behavior problems in adolescents.
Methods: One-hundred and six adolescents (M = 16.9, 50% male) completed the Trier Social Stress Test (TSST). ECG was continuously recorded during the task, from which measures of HR and RSA were obtained. Adolescents reported on their behavior problems and subjective emotional state before and after the TSST using established questionnaires (PANAS, YSR, BDI). Latent change score models were conducted to assess the relations between cardiac regulation, subjective emotion, and behavior problems.
Results: As expected, HR increased, and RSA decreased during task performance and measures of RSA and HR were significantly correlated. On average, youth reported less positive emotion after the TSST than before. Sex differences in subjective emotion were not significant but females reported more depressive symptoms than males; females also had higher HR on average and exhibited less RSA reactivity than males. For males, correlations between cardiac measures and subjective emotion are not significant. For females, change in RSA during the TSST is negatively associated with behavior problems and subjective emotion after the task. Through an influence on change in subjective emotion, RSA withdrawal is indirectly associated with greater depressive symptoms in female but not male youth (Figure 1).
Conclusion: In the context of a social evaluative threat, cardiac vagal withdrawal may not facilitate adaptive coping. Positive affect may play a role in adolescents' cardiac vagal regulation. Additional research is needed to better understand sex differences in these associations.

Figure 1. Latent change score model depicting associations between change in subjective emotion and RSA across the TSST for females



Note: model fit was good: $\chi^2 = 56.27(10)$, RMSEA = 0, CFI = 1; pre-stressor emotion is positively associated with pre-stressor RSA; RSA change is positively associated with change in emotion such that greater withdrawal of RSA is associated with greater declines in positive relative to negative affect across the TSST; through an influence on change in subjective emotion, RSA withdrawal is indirectly associated with depressive symptoms (B = -1.65, [-.05, -4.45]).

37. Extreme prematurity associated alterations of pulmonary inflammatory mediators before and after surfactant administration.

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Purpose: The gestational age-associated risk for postnatal oxygen dependence and the role of inflammatory mediators in the etiopathogeneses of bronchopulmonary dysplasia (BPD) has been well-defined. However, it is not known whether prematurity contributes to the alteration of vascular endothelial growth factor (VEGF) and cytokines in the tracheal aspirate (TA) before mechanical ventilation and after exogenous surfactant administration.

Methods: We conducted a prospective cohort study of 40 preterm neonates to identify the association of the level of immaturity with TA VEGF and interleukin (IL)-1β, IL-6, and IL-8, and tumor necrosis factor α (TNF-α) before and after administration of the first dose of surfactant and to assess the predictive role of inflammatory mediators in the development of BPD. Neonates were stratified into three groups, extremely preterm (Group 1, n=19), very preterm (Group 2, n=13), and moderate or late preterm (Group 3, n=8). Descriptive statistics and regression models were used to analyze the data.

Result: Group1 had lower VEGF and higher IL-8, TNF-α, and IL-1β compared to those in Group 2 and 3. Linear regression controlled models revealed a negative association of extreme prematurity with decreasing TA levels of VEGF and increasing IL-6, IL-8, IL-1β, and TNF-α. Irrespective of group allocation, VEGF and cytokine levels increased 10-12 hours after surfactant treatment, and this increase was significantly higher in Group1 than in Group 2 and 3. BPD was recorded in 10 of 17 extremely preterm survivals and was predicted considerably by an increase in IL-8 before and elevation of TNF-α after, surfactant administration.

Conclusion: Birth of extremely preterm infants is characterized by increased pulmonary production of pro-inflammatory cytokines and reduced VEGF and more significantly increased post-surfactant TA levels of not only pro- but also anti-inflammatory cytokines and VEGF than in preterm neonates born with gestational age of 28 to 35 weeks.

38.Influence of birth-related maternal and neonatal factors on levels of energy metabolism mediators in infants born at 32 or fewer weeks of gestational age.

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Purpose: The energy metabolism mediators such as adipokines (leptin, adiponectin, ghrelin) and insulin-like growth-factor-1 (IGF-1) are diverse proteins with hormone-like functional activities that produce and express receptors in different organs and tissue, including the placenta and fetal membranes. They are functionally interrelated in the regulation of fetal and neonatal growth and inflammatory processes. Our knowledge about the alteration of the levels of adipokines and IGF-1 in association with maternal and birth-related factors of very preterm born infants is still very limited. Such knowledge could be of relevance in the field of perinatal-neonatal medicine. This study evaluated the influence of birth-related maternal and neonatal factors on the postnatal levels of energy metabolism mediators in preterm infants born at gestational age (GA) < 32 weeks.

Methods: We measured leptin, adiponectin, ghrelin and insulin-like growth factor I in the infant's urine within 48 hours after birth. Mediator levels were analyzed by comparing dichotomized maternal and infant characteristics coded as 0 (No) and 1 (Yes) if an event was present. GA (< 27 vs. >27 weeks) and variables that showed differences at P-value <0.05 were included in the stepwise linear regression models.

Results: Among the 70 studied infants, 28.6% were born at GA <27 weeks, 18.6% with weight <750 grams, and 4.7% were small for GA (SGA). We identified an association of birth at <27 weeks with increased IGF-1, primigravida with increased leptin, nullipara with increased adiponectin, male gender with reduced leptin and ghrelin, and asphyxia with reduced leptin and increased ghrelin.

Conclusion: Either a single or a combination of several birth-related maternal and neonatal characteristics, including gravidity, parity, extremely preterm gestation, birth asphyxia, and male gender can predict the variance in the urinary levels of leptin, adiponectin, ghrelin, and IGF-1 during the critical early post-natal period in very preterm born neonates. The observed interactions were inconsistent in type, direction, and magnitude. Further studies are required to review the incongruity in the character and importance of the observed associations in order to understand their consequences on the postnatal adaptation of very preterm born infants.

39. Urinary levels of energy metabolism hormones in association with the proportional intake of maternal milk and weight gain in very preterm neonates.

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Purpose: Maternal milk is an essential source of energy metabolism hormones such as leptin, adiponectin, ghrelin, and insulin-like growth factor I (IGF-1) that take part in the regulation of various activities including but not limited to anti-inflammatory and antioxidant, homeostasis, and the infants' growth. However, knowledge about the concrete functional role of the energy metabolism hormones in the infant's growth is incomplete. This study prospectively investigated the levels of energy metabolism hormones in very preterm neonates to identify their change over time, association with intake of maternal milk, and weight gain velocity.

Methods: We measured and compared the leptin, adiponectin, ghrelin, and insulin-like growth factor I levels in the urine of 70 very preterm neonates, before the initiation of any enteral feeding (baseline level) and twice within 14 days on full enteral feeding (FEF). Repeated measurement ANOVA was used to outline the changes in the energy metabolism hormones tested at three points: within 48 hours after birth, at day seven, and day 14 on FEF. We constructed stepwise linear regression models to identify if the proportional quantity of daily maternal milk intake was predictive of the levels of energy metabolism hormones on day 14 in the urine of the studied neonates. The energy metabolism hormones measured after birth were included in each model, in addition to the variables that showed a difference between the feeding groups at a level of $P< 0.15$. Additionally, we constructed a stepwise linear regression model to identify which energy metabolism hormones and other relevant factors were associated with the median weight gain of the studied very preterm infants in the 14 days of FEF**.** We analyzed the adequacy of the weight gain velocity defined by the fetal-infant growth reference (FIGR). Additionally, we collected and analyzed the infants' clinical and feeding characteristics during the birth hospitalization.

Results: The preterm infants' baseline levels of the energy metabolism hormones significantly predicted their increase at the end of two weeks of observation on FEF. The leptin level was associated with increased intake of maternal milk, whereas the feeding volume was associated with increased ghrelin and IGF-1, and decreased leptin and adiponectin. Infants with comparable FIGR had higher leptin levels than those with inadequate weight gain velocity. In addition, the study revealed a significant risk for inadequate growth velocity in very preterm neonates who underwent mechanical ventilation during the NICU admission.

Conclusion: Postnatal increase in the leptin, adiponectin, ghrelin, and IGF-1 levels in urine of fully enteral fed very preterm neonates depends on their concentration at birth. An increased intake of maternal milk contributes to the level of leptin, which is the only one among the tested energy metabolism hormones that significantly reduced the preterm infants' risk for impairment of growth velocity during the birth hospitalization.

40. Absence of Kisspeptin in KNDy neurons of mice causes sexually dimorphic metabolic dysfunction on a high-fat diet

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Purpose: Kisspeptin neurons in the arcuate nucleus (ARC) of the hypothalamus are considered the gonadotropin-releasing hormone (GnRH) pulse generator to control gonadotropin hormone secretion that constitutes the reproductive axis. These neurons robustly co-express Neurokinin B and Dynorphin and are collectively named KNDy neurons. In addition, KNDy neuron kisspeptin is hypothesized to be a major sensor and regulator of metabolic homeostasis while relaying energy status to the hypothalamic-pituitary-gonad (HPG) axis. However, the direct metabolic impact of KNDy neuron kisspeptin has not been well-characterized.

Methods: To explore the role of KNDy neuron kisspeptin on metabolism, we examined the metabolic profile of our previously established KNDy neuron-specific kisspeptin knock-out mouse model (Pdyn-Cre/Kissfl/fl, or KO). We performed glucose tolerance tests, EchoMRI body composition analysis, and measured body weight in wild type (WT) control or KO mice fed with either regular chow or a high-fat diet (HFD, 60% kcal fat, Research Diets, New Brunswick, NJ) for 12 weeks post-weaning.

Results: At 4 weeks on the HFD, KO females weighed significantly more than HFD WT females, which continued through the remaining 8 weeks. Additionally, we found significantly decreased glucose tolerance and increased fat mass in HFD KO females compared to HFD WT females. However, KO males exhibited no significant differences in body weight, body composition, or glucose tolerance between the genotypes on either diet.

Conclusion: This data suggests that KNDy neuron kisspeptin is critical for metabolic homeostasis and preventing metabolic dysfunction when challenged with a high-fat diet. Our findings further suggest a sexual dimorphism whereby KNDy neuron kisspeptin performs this action predominantly in females.

41.Medical marijuana and cannabinoid products in pediatric hematology oncology: Provider Perceptions

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Purpose: As a growing number of states have legalized medical marijuana (MM), there has been a concurrent increase in patients and parents inquiring about the potential role of medical marijuana and cannabinoid (CBD) products in the treatment of pediatric hematology/oncology (PHO) patients. However, literature on the safety and efficacy of these treatments in this population is sparse, thus placing a greater reliance on the individual provider's perceptions and knowledge to form recommendations. The study purpose was to evaluate PHO providers' knowledge, perceptions, barriers and current practices for the use of medical marijuana and cannabidiol products in pediatric hematology and oncology patients.

Methods: An anonymous electronic 34 question survey was developed and piloted by PHO faculty. The survey information was sent to PHO providers in August 2021 with email reminders through December 2021.

Results: 362 providers have responded to the survey so far. Of those, 344 responders completed question block 1 (ability to prescribe MM/CBD and initiating conversations), 326 completed block 2 (recommending MM/CBD), 276 completed block 3 (resources used to form recommendations) and 271 completed the final block (confidence in knowledge). 71.8% (251/344) of respondents practice where medical marijuana is legal but only 7% (27/344) have a license to prescribe. While 88% (304/344) discuss MM and CBD with patients, 64% (220/344) of conversations are initiated by families/patient. Providers are most comfortable prescribing MM and CBD for management of chronic symptoms in collaboration with palliative care to alleviate nausea, vomiting, anxiety, pain, and stimulate appetite. Despite the frequency of conversations, only 15.6% (51/326) of providers recommended MM or CBD to more than 10% of their patients, with the primary reasons being lack of evidence in regards to efficacy and side effects. While 68% (189/276) used peer reviewed data to make decisions, providers also reported using information from non-peer reviewed sources (17.8%, 49/276), patients and families (22.1%, 61/276) and dispensaries (6.5%, 18/276). Almost half (48%, 130/271) expressed having insufficient knowledge to make recommendations regarding MM or CBD.

Conclusion: Most providers do not feel comfortable recommending either MM or CBD products, due to a lack of clinical trials and empiric evidence in the field of pediatric hematology and oncology. This highlights the need for clinical trials, education, and policy development in this rapidly growing field to best provide supportive care for our pediatric hematology and oncology patients.

42. Hypothermia limits activation of calcium-induced permeability transition pore (mPTP) in cerebral mitochondria.

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Purpose: Hypothermia is a standard of care in neonatal hypoxic-ischemic (HI) brain injury. However, the exact mechanisms of neuroprotection are not completely understood. Hypothesis: Hypothermic neuroprotection is driven by the attenuated mPTP activation in brain mitochondria because mitochondrial Ca2+ buffering capacity (mCBC) inversely depends on the ambient temperature.

Methods: Neonatal (p10) mice were subjected to the Rice-Vannucci model of HI. One group was recovered under normothermia (rectal t=37°C). Another group was exposed to 30 minutes of hypothermia (rectal t=32°C) followed by one hour of rewarming. Mitochondrial Ca2+ buffering capacity was examined at the end of HI, prior to reperfusion/hypothermia, at 30 minutes and at 4 hours of reperfusion. In the in vitro experiment, cerebral mitochondria isolated from control p10 mice were examined for their mCBC at different temperature.

Results: Prior to the initiation of reperfusion, both groups of mice exhibited significantly decreased mCBC compared to controls. At 30 minutes of reperfusion, mCBC recovered and did not differ from that in controls. However, at four hours of reperfusion, compared to controls, normothermic HI-mice exhibited significantly decreased mitochondrial mCBC, compared to controls. Organelles from hypothermic HI-mice exhibited near-normal ability to withstand Ca2+ induced permeabilization. Hypothermia was associated with a significantly decreased brain atrophy. Interestingly, normal cerebral mitochondria exhibited linear reverse dependence of their CBC upon ambient temperature (25 – 37°C) with a steep and significant decrease of Ca2+ tolerance at the temperature between 32°C and 37°C. Cyclosporine A increases mCBC at lower temperature but have no effect at 37°C. It is important to note that no t-dependent changes in the Ca2+ influx kinetic has been detected.

Conclusion: Based on these data, we propose that one of the mechanisms of neuroprotection driven by the post-HI hypothermia is the natural ability of mitochondria to tolerate Ca2+ toxicity at lower (non-physiological) ambient temperature.

43. COVID-associated Illness in Pediatric Emergency Department (ED) patients discharged Hhme: Presentations and outcomes

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Purpose: During the COVID-19 pandemic, many children seen in the ED with concern for COVID related complications, in particular MIS-C, undergo evaluation for MIS-C but are sent home since diagnostic criteria are either not fully met or are mild. We describe 14 patients who presented to the Robert Wood Johnson University Hospital Pediatric ED who met some criteria for MISC, but whose illness resolved with supportive care alone.

Methods. Retrospective chart review of patients seen in our Pediatric ED from March 1, 2020, through October 31, 2021, who had NT-proBNP values collected due to concern for COVID related illness. Data collection includes demographic and clinical characteristics, lab/imaging workup and any ED visits 3 months prior or subsequent to the index ED visit. For this interim analysis, patients were grouped according to febrile status on presentation to the ED. A Student's t test was used to compare normally-distributed data, and a Mann-Whitney Rank Sum Test to compare non-normally-distributed data. A P value less than 0.05 was considered statistically significant.

Results. Four patients were classified as febrile (temperature 100.4 F) on presentation, and 10 as afebrile. Febrile patients presented with significantly lower O2 saturation, and higher CRP and NT-proBNP (Table). Three of 4 febrile patients and 9 of 10 afebrile patients had either a personal or family history of COVID-19 infection, or tested positive in the ED. The most common presenting clinical symptom in febrile patients was cough (3 of 4, or 75%), while afebrile patients most commonly presented with chest pain (5 of 10, or 50%). None of the patients with chest pain had an elevated NT-proBNP, while two had a Troponin level of 6 ng/L.**Table. Presenting vital signs and laboratory values**

	Febrile (n=4)		Afebrile (n=10)		*P* value
	Size	Mean ± Std Dev	Size	Mean ± Std Dev	
Age	4	9.75 ± 8.81	10	9.99 ± 6.561	NS*
HR	4	128.25 ± 36.4	10	111.3 ± 25.2	NS*
O2 sat	4	96.0 ± 1.41	10	98.8 ± 1.03	0.00134*
Temperature	4	101.65 ± 0.93	10	98.5 ± 0.80	0.006**
WBC	4	12.2 ± 9.00	10	7.92 ± 4.92	NS*
ESR	3	24.5 ± 14.85	10	10.1 ± 4.61	NS**
CRP	3	5.69 ± 6.24	10	0.265 ± 0.24	0.044**
PLT	4	278.5 ± 156.4	10	269.1 ± 71.27	NS**
ALT	4	12.25 ± 4.27	10	28.75 ± 16.13	NS*
AST	4	31.5 ± 10.8	11	44.9 ± 26.9	NS**
D Dimer	3	873.3 ± 126.4	7	552.2 ± 304.6	NS*
Troponin	4	2.34 ± 4.04	9	3.005 ± 3.28	NS**
NT-proBNP	4	176.0 ± 175.2	10	38.3 ± 61.8	0.038**
Pro-Calcitonin	1	0.32	6	0.03 ± 0.01	--

*Student's t test; **Mann-Whitney Rank Sum Test

Conclusion: We report 14 patients seen in the Pediatric ED for suspected COVID-associated illness and discharged home. All five patients with chest pain had a normal NT-proBNP; two patients likely had post-Covid vaccination myocarditis, since both had an elevated Troponin level and presented within 2 weeks of a Covid-19 vaccination. None of the 5 patients with chest pain returned to our ED or Children's Hospital during the 3-month follow-up period.

44. The role of perspective-taking in facial memory in an undiagnosed group and a group with Autism Spectrum Disorder

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[1]

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Purpose: Individuals with Autism Spectrum Disorder (ASD) are characterized by their poor social skills, particularly perspective-taking, as well as their aversion of faces. Little is known about the relationship between facial memory and perspective-taking in individuals with ASD and whether such relationship can be extended to an undiagnosed group.

Methods: A group of undiagnosed individuals and a group diagnosed with ASD engaged in a facial memory task. Participants first memorized 16 faces and were then shown 32 faces (16 faces shown previously and 16 new faces) and asked if they had seen the face before and how confident they were in their response. Participants' social skills were evaluated using the Social Responsiveness Scale-2 (SRS).

Results: A Principal Components Analysis was conducted to determine SRS's underlying component structure. A five-component solution emerged: unusual behaviors, social interaction, social proximity, perspective-taking, and rigid behaviors. T-scores for total severity of social symptoms and perspective-taking were computed. Undiagnosed participants were categorized based on their symptom severity: "healthy" for participants with T-scores below 65 and "clinical" for participants with T-scores above 65. Grouped by the severity of total social symptoms, both the healthy (Mdn = 27.00) and clinical (Mdn = 27.00) undiagnosed groups recalled more faces correctly than the group with ASD (Mdns = 21.50), $\chi2(2) = 17,72$, $p < .001$, but were less confident than the group with ASD, $\chi2(2) = 27.25$, $p < .001$. Grouped by the severity of perspective-taking symptoms, the healthy undiagnosed group (Mdn = 27.00) performed significantly better on the facial memory task than the clinical undiagnosed group (Mdn = 24.50) and group with ASD (Mdn = 21.50), $\chi2(2) = 33.18$, $p < .001$. There was a significant difference in confidence, $\chi2(2) = 31.06$, $p < .001$. The healthy undiagnosed group (Mdn = 2.51) was more confident than the clinical undiagnosed group (Mdn = 1.64), but less confident than the group with ASD (Mdn = 4.48).

Conclusion: Problems in perspective-taking were associated with facial memory accuracy in a group with ASD as well as a group of undiagnosed individuals with clinical severity of perspective-taking problems. Given the relationship between perspective-taking and facial memory, it may be possible to facilitate facial memory skills in individuals with ASD by implementing interventions that target perspective-taking skills or vice versa.

45. The differences and similarities of facial memory development in three groups: Autism Spectrum Disorder, Attention Disorders, and Typically Developing

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Purpose: Facial processing plays a crucial role in guiding social interaction. Symptomatology in Autism Spectrum Disorder (ASD) and Attention Disorders (AD), particularly social cognitive deficits, overlaps considerably, resulting in the inability to provide targeted interventions.

Methods: Three groups, TD, with AD, and with ASD, engaged in a facial memory task. Participants first memorized 16 faces, and they were then shown 32 faces (16 faces shown previously and 16 new faces) and asked if they had seen the face before and how confident they were in their response. Participants were assigned to either the free-looking condition, where no facial encoding instructions were given, or the guided-looking condition, where certain facial features were highlighted.

Results: Accuracy improved with age for TD group, $r = .26$, $p < .001$, and group with AD, $r = .34$, $p < .01$, but not for the group with ASD, $r < -.01$, $p = .99$. The TD group ($M = 25.33$, $SD = 4.25$) and the group with AD ($M = 24.62$, $SD = 3.81$) performed better than the group with ASD ($M = 20.87$, $SD = 4.81$), $\chi2(2) = 24.47$, $p < .001$. The TD group responded more quickly during the recall phase, $\chi2(2) = 27.68$, $p < .001$, but were less confident than the clinical groups, $\chi2(2) = 47.14$, $p < .001$. The TD group, $U = 745.5$, $p < .01$, and the group with AD, $U = 268.00.5$, $p < .01$, performed better when facial encoding was guided while the group with ASD did not differ between conditions, $U = 182.50$, $p = .41$.

Conclusion: The present findings show that the development of facial memory in the group with AD was more like the TD group than the group with ASD in that their facial memory improves with age and can benefit from guided facial encoding. These findings suggest that individuals with ASD may have a specific facial memory impairment that neither improves with age nor can be ameliorated by training. With the evidence facial training is effective in individuals with AD, clinicians can provide targeted interventions to improve facial memory in individuals with AD, and in turn foster their social skills. For individuals with ASD, facial memory is a clear, specific deficit and should considered to be included to their major symptomatology.

46. Chronic health conditions and adolescents' social connectedness

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Purpose: To examine associations between chronic health conditions and social connectedness at age 15.

Methods: We conducted a secondary analysis of population-based data from the Fragile Families and Child Wellbeing birth cohort to investigate associations between chronic developmental/behavioral and physical health conditions and adolescent social connectedness using mother-reported child health conditions and youth-reported relationships and social connectedness. Associations were examined using logistic regression models adjusting for confounding factors.

Results: Of the 3,207 adolescents included, more than 1/3 had at least one chronic health condition. Compared to those with no chronic health conditions, adolescents with developmental/behavioral health conditions had significantly lower odds of social connectedness (AOR 0.80; CI: 0.67 - 0.94), having friends they really care about (AOR 0.76; CI: 0.61 - 0.94), having people who care (AOR: 0.65; CI: 0.50 - 0.84), and having people with whom to share good news (AOR: 0.77; CI: 0.63 - 0.94). Adolescents with chronic physical health conditions had equivalent odds to those with no chronic health conditions for social connectedness, having friends they care about, and having people with whom to share good news, but lower odds of reporting having people who care about them (AOR: 0.72; CI: 0.55 - 0.94).

Conclusions: Adolescents with chronic developmental/behavioral health conditions had lower odds of social connectedness, while adolescents with physical health conditions only had lower odds of reporting having people who care about them in this study of U.S. urban youth, suggesting the need for targeted resources and interventions.

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Ms. Suzanne Anderson