



May 10, 2022
4:00pm - 6:00pm
HSRB Auditorium

Agenda

4:00-5:30pm - Oral Competition
5:30-6:00pm - Networking Reception and Poster Session

Abstract Book

Online Poster Presentations available at [here](#).

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Oral Presentations

Impaired Ventilation during Six-Minute Walk Test in Congenital Central Hypoventilation Syndrome

Presenting Fellow: Radhika Ghosh, Pulmonary, Allergy & Immunology, Cystic Fibrosis, and Sleep

Authors: Ghosh, Radhika; Guglani, Lokesh; Westbrook, Adrianna L; Mao, Chad Y; Bai, Shasha; and Kasi, Ajay S.

Background: Congenital central hypoventilation syndrome (CCHS), a rare genetic disease affecting control of breathing, is caused by variants in the paired-like homeobox 2B (PHOX2B) gene. Due to impaired ventilatory responses to hypoxia and hypercapnia, patients with CCHS can develop gas exchange abnormalities during exercise. However, there is limited literature on cardiorespiratory responses during submaximal exercise and their correlation with the PHOX2B genotype.

Objectives: To assess oxygen saturation (SpO₂), end-tidal carbon dioxide (ETCO₂), heart rate (HR), and 6-minute walk distance (6MWD) during a six-minute walk test (6MWT) in CCHS subjects and to correlate them with PHOX2B genotypes and assisted ventilation (AV) via tracheostomy.

Methods: In this cross-sectional study, subjects with CCHS performed 6MWT with continuous pulse oximetry, HR, and capnography recorded before and during the 6MWT. Medical records were reviewed for PHOX2B genotype and phenotype data. Patients were categorized based on PHOX2B genotype and AV via tracheostomy.

Results: Fifteen subjects aged 10.5 (IQR 7.9-16.2) years completed the 6MWT. Nine subjects used AV via tracheostomy. Seven (47%) subjects developed hypoxemia (SpO₂ ≤ 90%, n=7) and hypoventilation (ETCO₂ > 50 mm Hg, n=3) during the 6MWT. There was a significant decline from baseline SpO₂, increase from baseline ETCO₂, and increase in HR during the 6MWT (all p < 0.05). Subjects had decreased median percent predicted 6MWD [59.7% (50.6%-62.5%)] suggesting functional limitation. Nadir SpO₂ (p=0.029) and peak ETCO₂ (p=0.046) differed significantly between PHOX2B genotype groups but 6MWD did not (p=0.8). There was no significant difference in the nadir SpO₂ (p=0.4), peak ETCO₂ (p=0.2), and percent predicted 6MWD (p=0.2) when subjects were categorized based on AV with or without tracheostomy.

Conclusion: Despite normal oxygenation and ventilation at rest and during sleep on AV, patients with CCHS can develop hypoxemia and hypercapnia during submaximal exercise. Our study highlights the importance of assessing for ventilatory disturbances in patients with CCHS even during submaximal exercise that is reflective of activities of daily living. Exercise studies may help clinicians formulate a safe and personalized exercise plan for each patient.

Examining Stigma Experienced by Adolescents Living with Perinatally-Acquired HIV in South Africa

Presenting Fellow: Madeleine Goldstein, Infectious Diseases

Authors: GOLDSTEIN, MADELEINE; Archary, Moherndran; Sibaya, Thobekile; Ndlela, Nompumelelo; Bergam, Scarlett; Fomo, Messaline; Hussien, Sophia A; and Zanoni, Brian C

Background: South Africa has the highest burden of adolescents living with perinatally-acquired HIV (ALPHIV) in the world. ALPHIV face social and logistical challenges, leading to suboptimal rates of engagement in HIV care particularly during transition from pediatric to adult-centered care. HIV-related stigma is associated with higher rates of depression, anxiety, and poorer quality of life during healthcare transition. We examined South African ALPHIV's experiences of stigma and its influence on healthcare engagement during transition from pediatric to adult care.

Methods: We conducted 20 in-depth interviews among ALPHIV at a government supported clinic in KwaMashu, an urban township outside of Durban, South Africa. We used purposive sampling including adolescents pre- and post-healthcare transition. The semi-structured interview guide was comprised of open-ended questions covering multiple aspects of stigma based on the HIV Stigma Framework. We used thematic analysis through an iterative, team coding approach combining deductive and inductive elements to contextualize how youth experienced stigma.

Results: Ten (50%) participants were male, the average age was 16.9 years (SD 1.45 years), and ten (50%) were pre-healthcare transition. Participants discussed the different contexts in which they experienced stigma within their own community (e.g., family, friends, and clinic). Participants expressed feelings of exclusion when describing instances of internalized, enacted, anticipated, and physical stigma, including not sharing utensils or food with family or friends due to their HIV status. Pre-healthcare transition, participants described waiting room stigma, in which participants felt increased internalized and anticipated stigma regarding feeling "different" from others in the adult clinic waiting room. Post-healthcare transition, several participants experienced HIV-related discrimination from adult clinic staff and peers, including assumptions about their mode of HIV transmission. Participants described how social support from peers, family and clinic staff helped them feel more connected to their community and cope with experienced stigma.

Discussion: Our findings show that different mechanisms of stigma, including internalized, anticipated, enacted, and physical stigma, decreases ALPHIVs' sense of belonging and contributes to barriers to engagement in care. Multicomponent interventions incorporating social support and targeting different types of stigma are needed to improve engagement in care for ALPHIV during healthcare transition.

Feasibility of the Virtual Reality (VR)-based Pediatric Display Enhanced Testing for Concussion and mild Traumatic Brain Injury (PeDETECT) tool in the pediatric emergency department (ED)

Presenting Fellow: Robert Grell, Emergency Medicine

Authors: GRELL, ROBERT; LaPlaca, Michelle; Wright, David W; Reisner, Andrew; Blackwell, Laura; Yu, Austin; Hurley, Dylan; Murthy, Naina; Kulkarni, Megha; Santos, Justin; Sarnaik, Avnee; Waldon, Emma; Zafar, Farzina; Nsofor, Maureen; Bush, Patricia; Simon, Harold K, Morris, Claudia R.

Concussion impacts over half a million pediatric patients annually and can lead to significant and protracted symptoms. Early recognition and intervention have been shown to improve long term outcomes, but upwards of 60% of patients with concussions leave the ED without a proper diagnosis.

Concussion is a clinical diagnosis that requires interrogation of multiple neurological domains. Multimodal testing within a self-contained, immersive virtual environment has potential to provide an objective diagnostic aide for austere settings such as the ED. The PeDETECT system helps address this diagnostic dilemma.

Objective/Design/Methods: To assess the feasibility of the PeDETECT VR device for assessment of pediatric concussion in the pediatric ED.

A prospective feasibility study was designed with a pre-enrollment feasibility that was defined as $\geq 80\%$ completion of the PeDETECT VR module. The main objective was to compare the completion percentage of the PeDETECT VR test in the pediatric ED patients presenting with head-injury vs control subjects without head injury. Secondary outcomes included user subjective feedback of the device, complex choice reaction time, simple reaction time, patient satisfaction, and ED length of stay. Mean \pm SD, unpaired student t-test, and chi-square were used for statistical analysis.

Results/Conclusions: To date, 144 patients have been approached, of which 83 were consented and 79 patients (55%) were enrolled (18 head injury, 61 Controls). Mean age of the group was 12 ± 2 years and 54% were male. There were no differences in age or gender between cases and controls. Rate of completion was 87% overall with no difference between head injury vs control groups (89% vs 87%, $p=0.81$ respectively). There was a statistically significant difference for gender (males [$n=43$]; females [$n=36$]) found for completion rates in combined groups (95% vs 78%, $p<0.02$). Secondary analyses of patient responses within the PeDETECT tests are ongoing.

The data demonstrates feasibility of PeDETECT use in the pediatric ED setting, supported by a completion rate of $\geq 80\%$. Headset use was not limited by head-injury or age. Gender differences were identified for rate of completion. Future analysis will include secondary outcomes, including the measured reaction time, which could be useful in demonstrating validity for objective concussion diagnosis.

Comparison of MIS-C Related Myocarditis, Classic Viral Myocarditis, and COVID-19 Vaccine related Myocarditis in Children

Presenting Fellow: Trisha Patel, Cardiology

Authors: Patel, Trisha; Kelleman, Michael; West, Zachary; Peter, Andrew; Dove, Matthew; Butto, Arene; and Oster, Matthew

Background: Although rare, myocarditis in the pediatric population is a disease process that carries significant morbidity and mortality. Prior to the SARS-CoV-2 related (COVID-19) pandemic, enteroviruses were the most common cause of classic myocarditis. However, since 2020, myocarditis linked to multisystem inflammatory syndrome in children (MIS-C) is now common. In recent months, myocarditis related to COVID-19 vaccines has also been described. This study aims to compare these three different types of myocarditis with regards to clinical presentation, course, and outcomes.

Methods: In this retrospective cohort study, we included all patients <21 years of age hospitalized at our institution with classic viral myocarditis from 2015-2019, MIS-C myocarditis from 3/2020-2/2021 and COVID-19 vaccine-related myocarditis from 5/2021-6/2021. We compared demographics, initial symptomatology, treatment, laboratory data, and echocardiogram findings.

Results: Of 201 total participants, 43 patients had classic myocarditis, 149 had MIS-C myocarditis, and 9 had COVID-19 vaccine-related myocarditis. Peak troponin was highest in the classic myocarditis group, whereas the MIS-C myocarditis group had the highest recorded brain natriuretic peptide (BNP). There were significant differences in time to recovery of normal left ventricular ejection fraction (LVEF) for the three groups: nearly all patients with MIS-C myocarditis (n=139, 93%) and all patients with COVID-19 vaccine-related myocarditis (n=9, 100%) had normal LVEF at the time of discharge, but a lower proportion of the classic myocarditis group (n=30, 70%) had a normal LVEF at discharge (p<0.001). Three months post-discharge, 18 of 40 children (45%) in the classic myocarditis group still required heart failure treatment, whereas only one of the MIS-C myocarditis patients and none of the COVID-19 vaccine-associated myocarditis patients did.

Conclusions: Compared to those with classic myocarditis, those with MIS-C myocarditis had more significant hematologic derangements and worse inflammation at presentation, but had better clinical outcomes, including rapid recovery of cardiac function. Patients with COVID-19 vaccine-related myocarditis had similar clinical presentation to patients with classic myocarditis, but their pattern of recovery was similar to those with MIS-C, with prompt resolution of symptoms and improvement of cardiac function. Long-term follow-up should focus on cardiac and non-cardiac consequences of myocarditis associated with COVID-19 illness and vaccination.

Virtual Cardiac Rehabilitation in Pediatric Heart Transplant Patients; a Pilot Study

Presenting Fellow: Daniel Ziebell, Cardiology

Background: Cardiac rehabilitation in pediatric patients who have undergone heart transplants has been shown to improve functional capacity. Widespread implementation has been limited mostly due to geographic constraints, specifically related to travel distance. The aim of this study was to implement and assess a virtual (home-based) cardiac rehabilitation program for children and adolescent heart transplant recipients.

Methods: Those enrolled were between the age of 10-20 years old, had undergone heart transplant at least 1 year prior, and had been cleared by their transplant cardiologist for exercise. Exclusion criteria included transplant rejection < 3 months prior. Eligible patients completed an initial cardiopulmonary exercise test (CPET), 6-minute walk test (6MWT), flexibility/strength assessment, and PROMIS self-reported outcomes questionnaire. Patients then underwent a 16-week intervention with exercise sessions twice weekly for 30-40 minutes with a trained exercise physiologist over WebEx virtual platform. At the end of week 16, patients repeated 6MWT, flexibility/strength assessment, and PROMIS questionnaire. Patients also wore Fitbit accelerometers to monitor daily activity levels.

Results: Thirteen patients were enrolled. The median age was 15.6 years (IQR 12.1-18.4) with a median of 10 years (IQR 6.5-12.1) since transplantation. Eight have completed the program thus far with 4 to complete the program in April 2022. One patient dropped out due to a lack of familial support and supervision. Overall session attendance was 89.9%. Post-intervention measurements showed improvement in 6MWT (median, +29m, $p=0.04$), push-up repetitions (median, +8, $p=0.01$), wall sit duration (median, +5 sec, $p=0.02$), plank duration (median, +10 sec, $p=0.04$), sit-up repetitions (median, +10 sec, $p=0.01$) and sit & reach distance (median, +5.8 cm sec, $p=0.01$). PROMIS measurement showed statistically significant improvements in self-reported fatigue (Δz -score -6, $p=0.001$) and sleep impairment (Δz -score -3.5, $p=0.05$) with non-statistically significant improvements in meaning/purpose (Δz -score +3.5, $p=0.23$) and stress (Δz -score -4.2, $p=0.12$). Average daily steps measured by the Fitbit accelerometer showed a median increase of 1463 steps per day per patient ($p=0.03$).

Conclusion: This initial pilot study has demonstrated the feasibility of a novel virtual cardiac rehabilitation with excellent adherence and improvements in measurements of physical fitness and quality of life.

Online Poster Presentations

Cat-Scratch Disease: 9 Years Of Experience At A Pediatric Center

Presenting Fellow: Omayya Amin, Infectious Diseases

Authors: Amin, Omayma; Rostad Christina; Gonzalez, Mark; Rostad, Bradkey; Calthrap, Shelley; Quincer, Elizabeth; Betke, Briana; Gottdenker, Nicole; Wilsons, Jonathan; Shane, Andi; Elmontser, Mohnd; Camacho, Andres; Senior, Tal; Smith, Oliver; Anderson, Evan; and Yildirim, Inci

Background: A more complete understanding of the epidemiology, risk factors, and clinical features of cat scratch disease (CSD) in children could help guide patient care.

Methods: We conducted a retrospective analysis of children presenting to a tertiary pediatric hospital system in Atlanta, Georgia between January 1, 2010, and December 31, 2018, who had serology, PCR, and/or cytopathological results consistent with a *Bartonella henselae* infection. We also retrospectively reviewed veterinary diagnostic results performed at the University of Georgia (UGA) from 2018-2020 to ascertain the burden of bartonellosis in companion animals within the state.

Results: We identified 304 children with CSD over 9 years with the largest proportion of diagnoses made during August (41/304, 13.5%) and September (47/304, 15.5%). The median age of child cases was 8.1 years (interquartile range (IQR) 5.4-12.1]; 156 (51.3%) were female; 242/262 (92.4%) reported feline exposure, while 55/250 (22%) reported canine exposure of those with exposure histories documented in the medical record. Although lymphadenopathy was present on physical examination in the majority of cases (78.8%), atypical presentations lacking lymphadenopathy were also common (63/304, 20.7%). Among children with radiographic imaging, 20/55 (36.4%) had splenomegaly and 21/55 (38.1%) had splenic and/or hepatic microabscesses. Among veterinary data, *Bartonella* seroprevalence was 12/146 (8.2%), all among canines, with a geographic distribution that spanned the state of Georgia.

Conclusion: Distinguishing clinical features of CSD included subacute regional lymphadenopathy in school-aged children in the late summer, almost all of whom had cat exposure. Atypical clinical manifestations of CSD were also commonly identified.

Cardiac Computed Tomography Verses Catheter Angiography Branch Pulmonary Artery Measurements in Infants with Single Ventricle Prior to Bidirectional Glenn

Presenting Fellow: Andrew Dailey Schwartz, Cardiology

Authors: DAILEY SCHWARTZ, ANDREW; Hashemi, Sassan; Kuo, James; and Slesnick, Timothy

Background: Cardiac Computed tomography (CT) is increasingly performed in place of catheter angiography (cath) for pre-operative planning in single ventricle (SV) infants prior to bidirectional Glenn operation (BDG). Imaging plays a crucial role in the care of these patients by assessing the need for intervention on the pulmonary arteries (PAs). Measurement variability of PAs obtained by CT versus cath has not been previously studied in this population.

Methods: Single center retrospective review of patients with SV anatomy who underwent both clinical CT and cath within 14 days. Proximal and distal branch PAs were measured from each modality. Orthogonal cross-sectional diameters were drawn for CT measurements and averaged, while cath diameters were measured from AP or lateral projections. Correlation was assessed using Pearson correlation coefficient and Bland-Altman analysis, with 95% limits of agreement calculated.

Results: 18 patients met inclusion criteria, with a median age of 78 days (range 7-189). 72% were male. Diagnoses included hypoplastic left heart syndrome (n=11), tricuspid atresia (n=3), and unbalanced atrioventricular canal defects (n=4). Cath PA diameters correlated better with the average of the orthogonal CT measurements than the larger or smaller diameter. There were no significant differences in the measurements of the PAs by CT and cath, with most differences less than 1mm.

Conclusion: Both CT and cath can accurately assess PA anatomy in SV patients prior to BDG

Sleep disturbances in parental caregivers and patients with congenital central hypoventilation syndrome

Presenting Fellow: Christina Finch, MD, Sleep Medicine

Authors: FINCH, CHRISTINA; Leu, Roberta; Harford, Kelli-Lee; Westbrook, Adrianna; and Kasi, Ajay

Introduction: Congenital central hypoventilation syndrome (CCHS), a rare disease caused by variants in the PHOX2B gene, affects control of breathing. Patients require lifelong assisted ventilation (AV) provided via positive pressure ventilation via tracheostomy (PPV-T), noninvasive positive pressure ventilation (NPPV), and/or diaphragm pacing (DP). Due to abnormal ventilatory sensitivity to hypoxemia and hypercapnia, abnormal arousal responses, and dependence on AV, patients require vigilant monitoring during sleep by a skilled caregiver. The aim of this study was to assess sleep disturbances in parents and patients with CCHS.

Methods: Parents of patients with CCHS completed the Pittsburgh sleep quality index (PSQI) for themselves and the sleep disturbances scale for children (SDSC) for their child. The analyzed data included: PHOX2B genotype, modality of AV, SDSC and PSQI scores, and nighttime skilled home nursing (HN).

Results: Nineteen participants completed the questionnaires. The median (IQR) ages of the parent and patient with CCHS were 41(38,51) and 11.3 (7.1,16.9) years, respectively. AV modalities were PPV-T (n=11), NPPV (n=6), and DP (n=2) that included AV with tracheostomy (n=11) and without tracheostomy (n=8). Patients were categorized into groups based on PHOX2B genotypes: 20/25 and 20/26 polyalanine repeat mutations (PARM, n=8), 20/27 PARM (n=7), and nonpolyalanine repeat mutations (NPARM, n=4). The median (IQR) PSQI and SDSC scores were elevated at 6 (4,10) and 42 (34,53), respectively. There was insufficient evidence to conclude that SDSC ($p=0.97$) and PSQI scores ($p=0.87$) differed by AV with or without tracheostomy.

Similarly, there was insufficient evidence to indicate that SDSC ($p=0.26$) and PSQI scores ($p=0.36$) differed by PHOX2B genotypes. Only 5 patients had nighttime HN. Parental sleep duration ($p=0.1$) and PSQI scores ($p=0.06$) did not differ significantly based on presence or absence of nighttime HN.

Conclusion: The global PSQI and SDSC scores were elevated suggesting that parental caregivers and patients with CCHS can experience sleep disturbances and poor sleep quality. Although there were no significant differences in PSQI and SDSC scores based on AV with or without tracheostomy, PHOX2B genotypes, and nighttime HN, our findings highlight the importance of assessing for sleep disturbances in parental caregivers and patients with CCHS and optimizing sleep health.

Impact of Target Tacrolimus Levels on BK DNAemia and Allograft Rejection among Pediatric Kidney Transplant Recipients

Presenting Fellow: Hou-Xuan Huang, Nephrology

Authors: HUANG, HOU-XUAN; Winterberg, Pamela; George, Roshan; Serluco, Anastacia; Liverman, Rochelle; Yildirim, Inci; and Garro, Rouba

Purpose: BK Polyomavirus (BK) DNAemia is a serious and common infectious complication after kidney transplant (KT). We evaluated the impact of targeting lower tacrolimus levels on the incidence of early-onset BK DNAemia in pediatric KT recipients at our center.

Methods: We conducted a retrospective chart review of 151 episodes of KT between 01/2013-12/2018 expanding upon a quality improvement project implemented in March 2015 to decrease target tacrolimus levels by 25% prompted by a cluster of early-onset BK DNAemia cases. Of the 129 patients included in analysis, 46 were in the pre-intervention cohort, and 83 were in the post-intervention cohort. All patients received induction with basiliximab and methylprednisolone and maintained on steroid based immunosuppressive regimen.

Results: Median age at KT [13(IQR 7 – 16) years], sex (65% male), and race (58% White, 34% Black) were not significantly different between cohorts. Overall, 53% of patients received deceased donor KT, 21% had underlying urologic disorder, and 13% had prior urologic procedures. 32.6% (42/129) of patients developed BK DNAemia within 18 months post-KT. The post-intervention cohort had non-significant lower incidence of early-onset BK DNAemia within 100 days post-KT (0.15 vs. 0.21 per 100 patient-days), longer median time to first detected BK DNAemia [139 (IQR 56 - 181) vs. 78 (IQR 59 - 184) days], shorter duration of BK DNAemia [59 (IQR 29 - 83) vs. 123 (IQR 57 - 301) days], and lower median peak viral load [16015 (IQR 3236 - 39185) vs. 30688 (IQR 1716 - 58541) DNA copies/mL]. More patients in the post-intervention cohort had at least one episode of biopsy-proven rejection within 18 months post-KT (42% vs. 37%, $p=0.56$) and earlier development of donor-specific antibody (DSA) ($p=0.042$).

Conclusions: The revised immunosuppression protocol with lower target tacrolimus levels resulted in reduction of early-onset BK DNAemia cases and more rapid clearance of BK DNAemia without reaching statistical significance. However, we observed a slight increase of rejection and earlier development of de novo DSA in the post-intervention cohort which may portend worse long-term graft survival. Modification of early immunosuppression to prevent viral infection in children should be balanced against possible increased risk of rejection.

The Association of Health Status and Health Quality with Physical Activity in Childhood Cancer Survivors

Presenting Fellow: Sanyukta Janardan, Hematology & Oncology

Authors: JANARDAN, SANYUKTA; Mertens, Ann; and Effinger, Karen

Background: Childhood cancer survivors (CCS) are at risk for therapy-related late effects. Physical activity (PA) improves outcomes, but CCS' rates of PA are low. This study investigated how survivor/proxy perception of survivor health status (HS) and health quality (HQ) are associated with PA in CCS. Negative perceived HS and poor HQ were hypothesized to be associated with low PA.

Methods: This was a cross-sectional, retrospective study of CCS aged 6-21 years and ≥ 1 year off-therapy. Low self/proxy-reported PA was defined as < 5 days per week with ≥ 60 minutes of activity per day. Negative perceived HS was defined as responses of "fair" or "poor" on questions about overall, physical, and mental health using the Patient-Reported Outcomes Measurement Information System Global Health measure. Presence of ≥ 2 late effects at survey completion indicated poor HQ. Multivariable logistic regression was performed to identify associations between PA and perceived HS or HQ. Kappa statistics were calculated to study concordance in responses between teens and proxies.

Results: Of the 285 CCS, 71.6% reported low PA. Negative perceived overall, physical, and mental HS were present in 5.6%, 10.5%, and 15.8% of CCS, respectively; 49.8% had poor HQ. There was no association between overall HS and PA ($p=0.434$). There were associations between negative physical (OR 6.1, 95% CI 1.38-27.44, $p=0.017$) and mental (OR 3.5, 95% CI 1.27-9.61, $p=0.015$) HS and low PA. Sex-stratified analysis demonstrated more females than males reported low PA (78.2% vs. 63.6%, $p=0.006$) and negative physical (14.1% vs. 6.2%, $p=0.031$) and mental (22.4% vs. 7.8%, $p=0.001$) HS. Associations between negative physical and mental HS and low PA were no longer significant for either sex, though the association between negative mental HS and low PA trended toward significance for females ($p=0.056$). There was no association between HQ and PA. Concordance between teens and proxies was low.

Conclusion: Addressing perceptions of CCS' HS in future PA interventions is critical for optimizing health outcomes. Female sex is a driver for low PA, suggesting sex-specific PA interventions may be effective. Ongoing development of validated self-report tools for younger CCS is important, given the discordant responses between teens and proxies.

Quality of Life Measures and Physical Activity in Childhood Systemic Lupus Erythematosus

Presenting Fellow: Meghan Nelson, Rheumatology

Authors: Nelson, Meghan; Gibson, Sinclair; Villacis-Nunez, D. Sofia; Chan, Lai Hin Kimi; Ponder, Lori; Moorthy, L. Nandini; and Prahalad, Sampath

Childhood systemic lupus erythematosus (cSLE) is a life-long disease with significant morbidity and mortality, and with associated significant impact on health-related quality of life (HRQOL). Previous literature supports that physical activity has positive impact on HRQOL in patients with chronic diseases, including cSLE. We sought to describe the physical activity of our patients with cSLE and determine the relationship between physical activity, SLE activity, treatment modalities and HRQOL in cSLE. Children ≤ 18 years of age with cSLE and their parents were enrolled and completed corresponding child and parent Simple Measure of Impact of Lupus Erythematosus in Youngsters[©] reports (cSMILEY[©] and pSMILEY[©], respectively), and the Physical Activity Questionnaire for Children (PAQ-C) or Adolescents (PAQ-A). Through retrospective chart review we assessed the SLE Disease Activity Index (SLEDAI) using the SLEDAI-2K assessment tool. Descriptive statistics as well as Pearson's correlation coefficients were performed with the data obtained. Forty-four children and their parents were enrolled; clinical data, SMILEY[©] and PAQ-C or PAQ-A scores of cSLE subjects were evaluated. The most frequently reported physical activity modality was walking (61.3%), with mean frequency of 3.7 ± 1.8 days a week, and a median of 3.5 days a week. While there was no correlation noted between treatment modalities and PAQ-C/PAQ-A, there was weak correlation between SLEDAI and PAQ-C/PAQ-A (Pearson correlation= 0.2, Spearman's rho= 0.1, p=0.9, n=44). There was a weak correlation between SMILEY total score and PAQ [cSMILEY[©] and PAQ-C/PAQ-A combined cohorts (Pearson correlation=0.2, Spearman's rho= 0.3, p=0.07, n=44), and modest correlation between pSMILEY[©] scores and PAQ-C/ PAQ-A combined cohorts (Pearson correlation=0.3, Spearman's rho= 0.3, p=0.05, n=44)]. Our study emphasizes the need for larger samples to understand the prognostic value of activity levels and the extent to which increasing physical activity might be linked to improvements in HRQOL in this vulnerable population.

Using Computer Based Training to Improve Emergency Department Staff Knowledge of Massive Transfusion Protocol

Presenting Fellow: Jeffrey Okonye,

Authors: Jeffrey Okonye, Ruth Hwu, Cassandra Josephson, and Katey Nicholson

High risk scenarios like pediatric Massive Transfusion Protocol (MTP) activations during trauma are at risk for medical errors due to their rare occurrence, imposed mental workload and reported lack of physician comfort. We hypothesized that the initiation of a computer based training module would increase knowledge and comfort of MTP amongst Emergency Department (ED) staff.

For this educational intervention study, the Pediatric Emergency Medicine physicians (attendings and fellows), trauma nurse specialists, trauma nurse clinicians, and Pediatric Intensive Care (PICU) nurses that work in two large pediatric EDs were eligible to participate. The intervention was an online computer based training module (CBT) that included a 10 question pre- and post-intervention assessment to measure knowledge and Qstream, an automated question delivery learning platform delivered the same questions 2 months later to assess knowledge retention. A survey with a 5-point Likert scale was used to assess the comfort of 5 components of MTP. It was distributed prior to the intervention and 6 months after.

Of the 180 medical staff eligible to participate, 85 participants completed the CBT. 76 participants completed the online pre- and post-intervention assessment and demonstrated an increase in mean score by 19.33% (95% CI: 14.58, 24.09; p-value <0.001). 104 participants utilized the Qstream software. 27 Participants completed both the CBT and Qstream and demonstrated some knowledge retention as evidenced by comparing their percentage of Qstream questions answered correctly on first pass (62.22%, SD 17.17) to their pre-intervention assessment mean (54.07%, SD 17.60). 99 participants (49 physicians and 50 nurses) completed the pre intervention comfort survey compared to 37 participants (24 physicians and 13 nurses) that completed the post intervention survey. Participants indicating they were comfortable (score ≥ 4) on the pre-intervention survey compared to post-intervention scores for the five areas of concern were: Activating MTP 69.7% vs 92.0%, MTP activation process: 70.7% vs 98.0%, calculating correct blood product dosage: 60.6% vs 84.0%, the order of blood product administration: 49.5% vs 84%, and nurses comfort with transfusing blood for MTP activations during traumas: 80% vs 93.8%.

A computer based training program was able to increase both knowledge and comfort with MTP.

Adverse Childhood Experiences and Quality of Life in Critically Ill Children

Presenting Fellow: Anna Rodenbough, Critical Care Medicine

Authors: RODENBOUGH, ANNA; Opolka, Cydney; Wang, Tingyu; Gillespie, Scott; Ververis, Megan; and Grunwell, Jocelyn

INTRODUCTION: Adverse Childhood Experiences (ACEs) are potentially traumatic events that occur in childhood and are associated with worse lifetime health outcomes. It is not known whether critically ill children experience higher ACEs than non-critically ill children or whether ACEs are associated with quality of life (QOL) in children. We hypothesized that children admitted to the pediatric intensive care unit (PICU) would have more ACEs than the general pediatric population and that critically ill children with higher ACEs would have worse reported measures reflective of QOL.

METHODS: This is an observational study in children aged 0-17 years admitted to a quaternary PICU in Georgia. Nine ACE questions from the National Survey for Child Health were administered; frequencies were compared to Georgia and U.S. population data. Eight Patient-Reported Outcome Measurement Information System (PROMIS) measures reflecting aspects of social, emotional, and physical health were also administered; T-scores were compared for children with one or no versus two or more ACEs.

RESULTS: Of the 84 children enrolled, 53% had at least one ACE and 24% had two or more ACEs, compared to 38% ($p<0.0001$) and 16% ($p<0.001$) in Georgia children and 34% ($p<0.0001$) and 14% ($p<0.02$) in U.S. children, respectively. Critically ill children had a significantly higher frequency of several unique ACEs when compared to children in Georgia and in the U.S., including parent/guardian divorce/separation (35% vs 26% and 23%, respectively; $p<0.001$), parent/guardian incarceration (19% vs 10% and 7%, respectively; $p<0.0001$), and witnessing or experiencing neighborhood violence (12% vs 4% and 3%, respectively; $p<0.0001$). Critically ill children who had two or more ACEs had worse reported QOL measures, including life satisfaction, meaning and purpose, positive affect, psychological stress experiences, anxiety, depression, sleep disturbances, and family relationships.

CONCLUSIONS: Critically ill children had more ACEs than non-critically ill children in Georgia and the U.S. Critically ill children with two or more ACEs had significantly worse measures of social, emotional, and physical health compared to children with one or no ACEs. Interventions to reduce ACE exposures and to mitigate their impacts in critically ill children may reduce the risk of worse long-term outcomes in this population.

Short-term Outcomes of Corticosteroid Monotherapy in Multisystem Inflammatory Syndrome in Children

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Background: Optimal agents and duration of primary treatment for multisystem inflammatory syndrome in children (MIS-C) remain unclear. We aimed to compare short-term patient outcomes based on initial treatment with corticosteroids, intravenous immunoglobulin (IVIG), or both.

Methods: We conducted a retrospective cohort study in a tertiary-care pediatric hospital system, including patients with MIS-C diagnosed from March 2020 to February 2021 per the Centers for Disease Control and Prevention case definition, whose immunomodulatory therapy within the first 24 hours (patients in the intensive care unit (ICU)) or 48 hours (non-ICU patients) consisted of Corticosteroids alone (CS Group), IVIG alone (IVIG Group), and IVIG plus corticosteroids (IVIG+CS Group). Primary outcome was failure of initial therapy, defined as therapy escalation due to fever, worsening/lack of improvement of laboratory, cardiac or non-cardiac clinical factors after 24 hours (ICU patients) or 48 hours (non-ICU patients) from time of therapy initiation, based on clinician assessment. Secondary outcomes included presence of complications, cardiovascular outcomes, fever duration, length of hospital and ICU stays, corticosteroid use duration, and need for re-admission.

Results: Among 228 eligible patients, 215 patients were included in univariate analysis; median age was 8 years and 135 (62.8%) were male. There were 69 patients in CS Group, 31 in IVIG Group, and 115 in IVIG+CS Group. Patients in CS Group had milder disease at presentation. After propensity score weighting including 179 patients (68 in CS Group and 111 in IVIG+CS Group), rates of initial treatment failure were similar between groups; among patients failing initial treatment, those in IVIG+CS Group were more likely to fail based on laboratory parameters (OR: 2.02; 95% CI: 1.1-3.71) and less likely based on cardiovascular markers (OR: 0.38; 95% CI: 0.2-0.75), per clinician assessment. Patients in IVIG+CS Group had a longer median inpatient stay (6 vs 5 days; $p=0.001$) and median corticosteroid course duration (10 vs 5 days; $p=0.04$) compared to CS Group. Forty-nine patients (71% out of 69 in CS Group) recovered with corticosteroid monotherapy for ≤ 10 days.

Conclusion: Corticosteroid monotherapy is a reasonable management option for a subset of MIS-C patients, particularly those with mild disease.