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UT SOUTHWESTERN

JOURNAL OF PEDIATRICS

Contents

Dear Readers,

We present to you the inaugural issue of the *University of Texas Southwestern Pediatric Residency Program's Journal of Pediatrics*. It represents some of our contemporary efforts to learn with and from our colleagues, and our desire to share this with a broader audience.

It's not a coincidence that we are launching this journal in the context of the COVID-19 pandemic. As seems true for many of our experiences related to the challenges of the pandemic, perhaps individual isolation and societal grief have made us even more committed to remaining connected with others.

This journal has three main sections: peer-reviewed case reports from our residents, posters presented by our senior residents at our 10th annual residency scholarly projects conference, and humanities creations from our current cohort of resident colleagues. We aim to use this journal as one enduring means to share highlights of our pediatric residents' educational experiences - with our Residency Program, our Department and the larger pediatric community.

It is a privilege and a joy to share with you some of the stories of those whom we seek to serve, the scholarship of our graduating residents, and the perspectives and artwork of our peers. We hope you find inspiration within.

Sincerely,

Jeffrey S. McKinney, MD PhD and Adeline Yang, MD MS

Editors-in-Chief

Chief Resident Time Capsule

By 2021-22 Chief Residents: Drs. Adeline Yang, Benjamin Masserano, Karin Claussen, and Sarah Soffer

Synopsis of major program changes and innovations made during academic year 2021-2022.

Academic Half Day

- 32 faculty lectures for 115 residents
- Lectures recurred on a regimented basis to allow for each resident to participate in every lecture (8 lectures given four times, 90% attendance)
- Lecture content aimed at outpatient medicine, areas of ITE weakness, and interactive content:
  - Chronic Urticaria and Journal Club with Dr. Rory Nicolaides
  - Sepsis Simulation and TBL with Dr. Archana Dhar
  - Antibiotic Principles with Dr. Natasha Hanners
  - Principles of Child and Adolescent Psychiatry with Dr. Rachel Zettl
  - STI Clinical Pearls with Dr. Jenny Francis
  - Child Poverty TBL with Drs. Nancy Kelly and Dr. Dorothy Sendelbach
  - Complex Care for the General Pediatrician with Dr. Patricia Petroff
  - Vital Talk Sims with Dr. Katie Maddox
- Re-introduced clinical reasoning conferences for all residents to promote a longitudinal tie of critical thinking and medical decision making with program faculty, advisors, and chief residents
- Created protected time for residents to complete work hours, faculty evaluations, procedure/clinic logs, as well as informal mentoring with faculty

Advocacy

- Conducted 3rd year of Community Organization Resident Practicum (CORP) Elective, hosting 49 speakers representing:
  - 4 non-profits leading systems-level interventions
  - 6 legislative policy organizations
  - 5 outreach organizations
  - 4 community providers
  - 4 non-profits focusing on developmental differences and/or chronic medical needs
  - 4 early education groups
  - 6 Divisions within UT Southwestern Medical Center and/or Parkland Hospital
  - 3 media organizations
  - 3 mental health intervention programs
- Developed and launched Project Education, Leadership, and Mentoring (ELM), a cascading mentorship program for high school students, medical students, residents, and attendings identifying as members of Black, Indigenous, and People of Color (BIPOC)
- Collaborated with the Train the Trainer Implicit Bias Training program, developed by Dr. Quinn Capers; integrated this into the CORP elective.

Board Preparation

- Curated set of board preparation questions delivered via weekly 5-question sets.
- Expanded chief-led board preparation lectures with a fun presentation format.
- Designed an APD-led board preparation support program to provide additional funding and guidance to residents at the highest risk of board exam failure based on ITE results

Cardiology

- Designed new 2-team model with focus on general cardiology patients on the resident service resulting in improved noon conference attendance and rotation evaluations across all surveyed domains.
- Instituted twice-monthly heart failure case presentations by PACC attendings.
- Organized the addition of heart failure clinic as part of the PGY-1 ambulatory rotation.

Career Preparation

- Redesigned outpatient opportunities section in UTSW Pediatric Residency Team to a more user friendly and useful format
- Presented “The Nuts and Bolts of the Fellowship Application Process”
- Coordinated touchpoints for residents pursuing careers in outpatient medicine with faculty stakeholders
- Launched the primary care boot camp
- Individualized curricula website launched – includes feedback from alumni and fellowship program

directors on scholarship milestones, elective recommendations, and common interview items

Education Liaisons/Inpatient Education

- Structured the role of education liaison and identified liaison(s) within every division of the department of pediatrics.
- Worked with liaisons to form topic lists and designed a system by which inpatient education is tracked and regular feedback is provided to inpatient educators with a standardized survey that allows for comparison in education quantity and quality between divisions.
- Levine Lecture 2022 given by Dr. Perri Klass

Electives

- 8 New / Redesigned electives: Resident admitter service, Camps (Sweeney and Spina Bifia), Custom Procedures, Heart Failure (PACC), Rare Diseases (NORD), Psychiatry, Ultrasound
- Catalogue revamped to specify number of rotators, rotation duration options, and scheduling during continuity clinic weeks
- Elective pre-item system created to help residents prepare for specialized rotations
- Outside rotator elective process streamlined
- Elective sign-up system standardized
- PLA process simplified
- Standardized LGO templates: process was recognized nationally with presentations at PAS and APPD

Emergency Medicine

- Created a system wherein residents could flex to low-acuity areas to alleviate the risk of overstaffing in the high acuity pods.
- Under the leadership of Dr. Kim Van Horn – revamped the ER schedule to allow for 9hr shifts for PGY2 residents, transition away from the Pit Boss role, and expansion of resident coverage for 3 pods.

House Cup

Instituted the House Cup incentive system by which residents are assigned "Houses" based on their schedule and earn points by completing administrative tasks (duty hours, noon conference attendance, weekly board prep).

Intern Conference

- Piloted "reverse" journal club: focus on an interactive, no preparation-needed discussion highlighting controversial topics in medical education
- Chiefs selected articles, posed the research question to the group, and the interns designed a study to answer this question. The Chiefs then presented the paper, and most often, the interns would have already understood the limitations and criticisms of the study.
- Helped interns learn to critically appraise journals and sculpt their scholarly projects.

M&M

- Templates for clearer presentation structure
- Evidence-based approaches to analyzing medical error and cognitive biases
- Forms to automatically generate a database of cases to monitor for quality improvement

Moonlighting

- Designed system wherein all residents in their final year of training could moonlight on their physician in training license provided they remain in good standing.

Nephrology

- Redesign of admission process and initial triaging, to disposition high-acuity direct admissions
- Multidisciplinary series of improvements to the formula order, including: default to search for formula name among all available options; inclusion of new additives; optimizing feed start times; initial design for new "NPO" or "preparation for procedure" diet; option to "pause" formula while NPO order is active; clarity on what floor stock is ready-to-feed

PICU

- "Flex" shift introduced to A team to act as a 4th provider as needed, and create opportunities for self-directed learning and processing
- RISE sessions as protected, in-person time
- Restructured teams to nearly eliminate 2-provider days
- No more 6-consecutive night shift stretches
- Improved integration of our Emergency / Family medicine resident colleagues into the PICU teams

Recruitment

- Created the Sharepoint website that houses the "Wall of Faces" testimonial videos.
- Updated Website and social media (Instagram) outlets with more detailed and user-friendly info
- Redesigned and rewrote pediatric residency brochure sent to all interviewees
- Created and distributed an entirely new recruitment video detailing "A Day in the Life" of UTSW pediatric residents
- Redesigned recruitment day schedule and PowerPoint to allow for more succinct and clear delivery of program messaging

Research

- Centralized website with guides, resources, contacts, databases of open & past projects
- Faculty mentors for projects, scholarly proposal feedback, and case report review
- Partnership with UTSW archivists and institutional repository (Chianta Dorsey) to launch the UTSW Journal of Pediatrics
- PGY2 Scholarly Proposal form & faculty review
- Scholarly symposia format: Thursday evening event and Friday main session
- PSTP2 pathway-specific milestones
- UTSW Journal of Pediatrics: case reports, scholarly symposia submissions, humanities section
- Resident Research Committee: three of our resident committee members were accepted for presentation at PAS and APPD
- Workshop series led by Dr. Etze Chotzoglou
- Peer writing series led by Dr. Hala El-Mikati
- Scholarly work from all four chief residents were accepted for presentation at the APPD Chief's Forum:
    - Adeline Yang (Platform): Resident Driven Research Program: Multiyear Assessment and Current Initiatives
    - Benjamin Masserano: Building Board Preparation Support on a Budget
    - Sarah Soffer: A Residency-led Cascading Mentorship Program towards Diversity in Pediatrics
    - Karin Claussen: Redesigning Academic Half Day

Simulation

- Coordinated eight simulation half-days for 115 pediatric residents to allow for near complete penetrance of the residency (90%)
- Curated curriculum based on current resident equational deficits and chiefs/simulation residents wrote simulation scenarios including:
- Status Asthmaticus in the Emergency Department (Traditional simulation)
- Acute Hemorrhagic Shock in the Emergency Department (Rapid Cycle, ATLS style)
- Status Epilepticus in the Emergency Department (Traditional simulation)
- Cardiogenic Shock from Viral Myocarditis on the Pediatric Ward (Rapid Cycle, PALS reinforcement)
- Coordinated procedural skills stations for simulation half day
- Pharmacy stations learning the basics of code medications and components of MET/CODE bag taught by Emergency Department Pharmacists and Pharmacy Residents
- Intraosseous task trainers and Respiratory Station with oxygen delivery devices, intubation, and tracheostomy task trainers taught by Pediatric Emergency Medicine Fellows
- Coordinated new simulation faculty lead position for the UTSW department of pediatrics

Sick Call (SC/BU) / Jeopardy

- Increased SC support across entire academic year (>94% of weeks with SC availability)
- Minimized "cold call" activation by establishing SC schedule at the start of the academic year
- Established process for order of activation (sick call, back up) as well as sequelae for unjustified deferment
- Unprecedented peer support via SC this year in light of COVID-19 (303 shifts as of May 2022). Additional shift coverage received from PEM and nephrology attendings/fellows, which was critical to operations during the holiday COVID-19 omicron surge.

Surge

- Creation of Friday "Senior Rounds" to highlight diagnostic dilemmas, higher-order management and disposition triaging, to prepare our senior residents for independent practice. Invited faculty included our program director, chief resident(s), community practitioners, geneticists, and PEM.
- Creation of "flex" shift to act as first-line, high-autonomy support for acute staffing needs, as well as assistance with wards admissions

Wellness

- Coordinated two new resident appreciation weeks the week of the holiday gathering and the week of graduation
- Created inaugural wellness committee creating new initiatives: UV lights in internal rooms, peloton account for the residency in the PRC, regularly stocked healthy snacks in PRC, installed new water/ice machine in PRC
- Implemented more RiSE sessions throughout residency training including standing sessions at the end of PICU, NICU, ED, and Gastroenterology rotations
- Implemented chief debrief sessions into six academic half day sessions to normalize and validate resident concerns as well as understand areas where the program can improve
- Implemented standing wellness half days during outpatient blocks for the upcoming academic year for residents to have scheduled personal time to make doctor appointments, therapy appointments, and wellness time

CASE REPORTS

A Case of Persistent Rectal Bleeding in a 16 Month Old Female

Sriharsha Kambala MD, Department of Pediatrics
Norberto Rodriguez-Baez MD, Department of Pediatrics, Division of Gastroenterology and Hepatology
Jacobo Santolaya MD, Department of Pediatrics, Division of Gastroenterology and Hepatology
Date of Resident Mid-Day Report Presentation: February 11, 2022

Case Description

Sixteen-month-old, 36 week and 5 day gestational age female presented to the emergency room with six days of bloody diarrhea. Per mother, she was born via spontaneous vaginal delivery, up-to-date on vaccinations, and meeting all appropriate milestones.

She initially was admitted to an outside hospital six days prior with three days of increased watery stool output and decreased oral intake and concern for intermittent bloody streaks in the stool. She was hospitalized for three days during which abdominal ultrasound, multiple abdominal X-rays, blood work, and stool culture were completed. The patient was anemic to 7.6g/dL, however, she was not transfused during the initial hospitalization at the outside hospital. The remainder of the evaluation was negative and she was discharged with a diagnosis of viral gastroenteritis.

She presented to the Children's Medical Center Dallas emergency department with worsening pallor and decreased PO intake of solids. Most concerning to the mother was the lack of resolution of red streaks in diapers following discharge from the outside hospital. Additionally, the mother reports that the daughter had painful episodes of "crouching" and "lying down" prior to stooling, which had spontaneously improved prior to arrival to the emergency department.

The review of systems was positive for pallor, fatigue, decreased energy, and appetite in addition to rectal bleeding with bright red streaks. It was negative for fevers, emesis, altered mental status, upper respiratory infections, hematemesis, epistaxis, petechiae, or purpura.

Family history was negative for inflammatory bowel disease, irritable bowel syndrome, coagulopathies, or anemias. This patient did not have any other significant past medical or surgical history.

Physical Exam: Vital signs were all within normal limits, without tachycardia or hypoxemia. The patient was active and alert during the exam. Furthermore, cardiovascular and respiratory exams were without murmurs, rubs or gallops, or accessory breath sounds. The patient did not have evidence of active bleeding such as epistaxis, wet purpura, or petechia. Her abdomen was non-tender, without hepatosplenomegaly, and had normal bowel sounds throughout all four quadrants. Her rectum was non-erythematous; no anal fissures, hernias, or tags were noted.

Initial lab work consisted of a complete blood count (CBC), type and screen, coagulopathy labs, and inflammatory markers. Of note, the only abnormality in these labs was an initial hemoglobin of 9g/dL. In the emergency room, additional studies were collected including a fecal occult blood test and stool culture. Initial imaging consisted of an abdominal x-ray and an ultrasound of the ileocecal valve to assess for intussusception. The results of these studies were within normal limits and did not identify a clear source for the bleed. Her abdominal x-ray did not detect any acute process and no ileocolic intussusception was identified within the abdomen.

Differential and Diagnostics

Differential diagnosis for acute rectal bleeding can be distributed into three major categories based on the nature of the bleed. Bright red blood per rectum or hematochezia is often associated with lower GI tract bleeding. The differential includes anal fissures, beta-hemolytic streptococcal proctitis, ulcerative proctitis, rectal prolapse, solitary rectal ulcer, and internal hemorrhoids. Occult gastrointestinal blood loss is associated with small volume bleeding throughout the GI tract including esophagitis, peptic ulcer disease, eosinophilic gastroenteritis or colitis, inflammatory bowel disease, polyposis, Meckel's diverticulum, or vascular malformations. Lastly, melena is associated with blood originating in the upper gastrointestinal (GI) tract that has been broken down in the GI tract by the time of presentation as rectal bleeding. Conditions associated with melena include intestinal ischemia, Meckel's

diverticulum, Henoch-Schonlein purpura, inflammatory bowel disease (IBD), vascular malformations, hemolytic uremic syndrome, necrotizing enterocolitis, or infectious enterocolitis.

For this patient, as she intermittently had hematochezia vs melena, bleeding from throughout the GI tract was considered. Given her lack of family history and young age, inflammatory bowel disease was lower on the differential. She did not have clinical evidence of intussusception and was older than the typical age for necrotizing enterocolitis. Highest on the differential were infectious enterocolitis, vascular malformations, and Meckel's Diverticulum. The patient's Meckel's scan did not show any evidence of ectopic gastric mucosa. At this time, the patient continued to have rectal bleeding, so the decision was made to perform an esophagogastroduodenoscopy and a colonoscopy to assess for IBD vs vascular malformations.

The upper GI endoscopy was without gross evidence of esophageal, gastric, or duodenal erythema, ulceration, or erosion. Her colonoscopy findings showed that the mucosa of the rectum and entire colon up to the hepatic flexure was erythematous and edematous, with exudate, loss of vascular marking, friability, erosion, and scattered ulcers. The ascending colon and cecum had no visible erythema or ulceration. Terminal ileum had scattered erosions, but no ulcers. The pathology report showed chronic gastric inflammation of the antrum and gastric body and chronic active colitis with cryptitis and granulomas of the descending colon. The rectum biopsies also showed focal active colitis. Given this substantial evidence for chronic inflammation of the GI tract, the diagnosis of very-early-onset inflammatory bowel disease (VEO-IBD) was made at this time.

Diagnostics and Diagnosis

VEO-IBD is defined as chronic inflammation of the gastrointestinal tract presenting before the age of six years old, with prolonged inflammation leading to damage of the GI tract. Very-early onset inflammatory bowel disease occurs in approximately 6 – 15% of the pediatric inflammatory bowel disease population. The onset of disease must occur before the age of six years to meet diagnostic criteria. Between 1994-and 2009, there was a rise in the incidence of VEO-IBD from 1.3 to 2.1 per 100,000 children.

In patients with a more aggressive phenotype, earlier age of onset, and a strong family history, a subset of VEO-IBD is thought to be a monogenic disease. Often these genetic mutations are associated with primary immunodeficiencies. However, for most VEO-IBD cases, disease onset and progression are multifactorial – most prominently environmental exposures in the gut microbiome and genetic abnormalities. Approximately 40% of all VEO-IBD patients will have extensive pan-colonic inflammation at the time of presentation. However, unlike older or adult-onset IBD, the extent and location of the disease can change and progress, making it more difficult to differentiate Ulcerative Colitis from Crohn's Disease. Features that help to differentiate these two diseases such as granulomas and villous blunting can also present at various times making colonic distribution an unreliable marker for specification. Therefore, IBD-unclassified (IBD-U) is diagnosed more often in patients with VEO-IBD (11%-22%) as compared to older onset IBD (4%-10%). Current cohort studies show that 15-20% of patients with VEO-IBD have a monogenic disease process.

Mechanisms of monogenic disease can be broadly characterized into five categories. The first includes variants influencing the integrity of the intestinal barrier such as loss of function mutations in ADAM17. The second is variants influencing bacterial recognition and clearance such as chronic granulomatous disease where there is defective intestinal phagocytosis due to defective granulocytes. The third is variants that influence anti-inflammatory pathways such as loss of function mutations in the IL10 ligand and receptors. The fourth is variants that influence regulatory T cells such as mutations of the FOXP3 gene inhibiting regulatory T cell development. The fifth includes variants influencing the development of adaptive immunity, such as B cell deficits and mutations.

The evaluation algorithm consists of four arms including immunologic studies, genetic studies, endoscopic studies, and radiologic studies. Immunologic studies consist of a CBC, inflammatory markers, immunoglobulins, neutrophil respiratory burst assay, lymphocyte subset profile, and phenotype-specific studies such as IL10 function. Genetic studies include VEO-IBD targeted gene panels that can be expanded to whole-exome sequencing or whole-genome sequencing to assess for monogenic disease or genetic comorbidities.

In this patient's case, she did not have initial pan-colonic inflammation or severity of illness that was indicative of monogenic disease. This was further corroborated by a lack of family history. Therefore, the decision was made to treat inflammation with a short course of steroids and then place her on a bimonthly schedule of infliximab injections. However, she did not improve on this schedule, and infliximab was increased to monthly 10 mg/kg injections. Three months into the initiation of treatment, hematochezia was still not ideally controlled, so there was now suspicion that this patient was a TNF-inhibitor non-responder. This was atypical for patients who did not have monogenic disease and necessitated further alteration of her medication regimen.

Conclusion

This patient ultimately had multiple flares following the initial diagnosis that required hospitalization. She was hospitalized six weeks after diagnosis due to the increased frequency of "wine-colored" stools for 4 days preceding admission. She received an Infliximab infusion and was discharged with the initiation of iron supplementation. During her three-month follow-up clinic visit, the mother endorsed melena 4-6 times daily with associated abdominal pain. Given the concern that this patient was a TNF inhibitor non-responder, she was prescribed a 1-month prednisone taper to address active flare. Repeat endoscopy now shows progression of disease with ulcers and erosion of the stomach and duodenum. Alternative therapy, including vedolizumab with tacrolimus, ustekinumab, or tacrolimus monotherapy, is now actively being considered as her acute symptoms have resolved but underlying inflammation was worsened on repeat EGD and colonoscopy. The decision to transition to an alternative biologic therapy is still being discussed with the parents.

Case Clinical pearls

Very Early Onset IBD is defined as chronic inflammation of the gastrointestinal tract presenting before the age of 6 years. TNF-alpha inhibitors such as infliximab and steroid courses are the first line therapy for VEO-IBD. In patients with a more aggressive phenotype, earlier age of onset, and a strong family history, there is a subset of VEO-IBD that is thought to be a monogenic disease. Often these genetic mutations are associated with primary immunodeficiencies and finding effective treatment is often very difficult

Keywords: Very Early Onset Inflammatory Bowel Disease, Colonoscopy, PUCAI Score, TNF Inhibitor, Monogenic Defects

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Rare secondary malignancy mimicking osteomyelitis

Jonathan S. Fletcher MD PhD, Department of Pediatrics

Date of Resident Mid-Day Report Presentation: August 13, 2021

Case Description

A 10-year-old male with a past medical history of high-risk pre-B-cell acute lymphoblastic leukemia (HR pre-B ALL), in remission, presented as a transfer from an associated hospital for further management of worsening left hip pain and refusal to ambulate. Based on prior imaging and laboratory evaluation, these symptoms had been attributed to treatment refractory osteomyelitis as the most likely underlying diagnosis. The patient's leukemia was diagnosed 5 months prior after presenting with a one-month history of easy bruising, epistaxis, fatigue, fever, weight loss, and night sweats. Based on his elevated leukocyte count of greater than 100,000 cells/mL, absence of blasts on cerebrospinal fluid cytopathology, flow cytometric phenotyping, and absence of other risk modifying factors per karyotyping/fluorescence in-situ hybridization, he was diagnosed with CNS1, HR pre-B ALL. After induction therapy, he was negative for minimal residual disease. In the interval between completion of induction therapy and this presentation he had two hospital admissions, for febrile neutropenia and fever with viral illness respectively, from which he recovered appropriately.

He was first noted to have left leg pain at a follow-up admission for chemotherapy about 3.5 months after initial diagnosis. At the time, the pain was non-focal, did not affect gait or range of motion, and was without associated fever, warmth, tenderness to palpation, or B symptoms. Over the next week, however, he developed worsening left leg pain and hesitancy to ambulate. On subsequent exam in clinic, he was found to have reproducible tenderness to palpation over the upper left thigh and pain with passive rotation of the left hip. He remained afebrile without swelling, warmth, or erythema over the region. Given the absence of laboratory or clinic findings concerning for serious bacterial infection, a several-day trial of conservative management was attempted. When he failed to improve magnetic resonance imaging (MRI) of the left hip was obtained and concerning for left hip osteomyelitis. He was admitted to an associated hospital around one-week later after failure to improve with outpatient clindamycin therapy.

At the associated hospital, a needle biopsy of the affected area was obtained for culture and histopathology and antibiotic therapy was broadened to ceftriaxone and clindamycin. Chemotherapy was held given concern for progressive infection and granulocyte colony stimulating factor was given to correct his chemotherapy-associated neutropenia. Cultures remained negative in the context of 1-week of clindamycin pre-treatment and evaluation by Karius next-generation sequencing was likewise negative. The biopsy sample demonstrated reactive bone without evident inflammation or malignancy. Given his persistent symptoms and unclear diagnosis, his family requested transfer to our facility for further management.

Differential and Diagnostics

Given the patient's history of illness, exam, and laboratory and imaging findings, our primary differential diagnoses centered on osteomyelitis/septic arthritis due to typical or atypical organisms refractory to prior antibiotic therapy (clindamycin/ceftriaxone) versus neoplastic processes such as relapse of primary leukemia, a primary bone or chondroid lesion, or an alternative secondary bone malignancy. Chronic non-bacterial osteomyelitis (CNO) was also considered, but the unifocal, progressive nature of his lesion would be highly atypical. Likewise, the MRI appearance and associated joint involvement would be atypical for osteonecrosis (such as can occur secondary to steroid therapy). We first obtained repeat MRI of the patient's hip which re-demonstrated left proximal femoral changes consistent with osteomyelitis with interval progression of the associated hip fluid collection and adjacent muscular edema. Therefore, the decision was made to perform irrigation, debridement, and biopsy per Orthopedics for source control of potential infection and to obtain more optimal biopsy samples for histopathologic and laboratory analysis. After the procedure, antibiotic coverage was further broadened to vancomycin/cefepime, providing better coverage against methicillin-resistant Staphylococcus aureus, Pseudomonas aeruginosa and atypical organisms.

Initial biopsy results demonstrated a histiocyte-rich (CD68+, S100+) lesion consistent with reactive process

(to infection/inflammation) versus tenosynovial giant cell tumor versus histiocytic neoplasm. Specimens were sent to an outside expert for further evaluation. Staining for bacterial and fungal elements was negative, and cultures subsequently remained negative. Repeat Karius next-generation sequencing was negative for known pathogens or likely opportunists, excepting increased Proprionibacterium acnes DNA, consistent with contamination vs unlikely opportunistic pathogen. The patient initially improved after the procedure, but subsequently developed recurrent/worsening pain, fever, and progressive anemia/thrombocytopenia, concerning for a relapse of his primary ALL or initial presentation of a secondary malignancy.

Given these concerns, PET CT was obtained, which unfortunately showed numerous hypermetabolic, enlarged abdominal lymph nodes and diffuse smaller hypermetabolic lesions in the spleen, liver, lung, and axial and appendicular skeleton. Bone marrow biopsy of his contralateral hip was obtained without evidence of B-lymphoblasts suggestive of a relapse of his primary ALL. Instead, these findings were concerning for a histiocytic malignancy. Further histiopathologic evaluation by an external expert demonstrated an atypical proliferative population of CD68+; CD163+; CD14+; CD1a rare; Langerin rare cells most consistent with histiocytic sarcoma. Subsequent biopsy of an abnormal lymph node showed effacement of normal structure by a similar population of abnormal histiocytes, confirming the diagnosis.

Diagnostics and Diagnosis

Several rare histiocytic lesions of varying prognoses have been described following ALL. The pathologic diagnosis of histiocytic sarcoma (HS) is suggested by expression of the myeloid markers CD68, CD163, CD14, high mitotic rate (>10%) and rare/absent markers of Langerhans cells (CD1a, Langerin). HS is associated with the poorest prognosis among these lesions. In a 2010 review of histiocytic lesions following ALL, the 4/18 cases of HS accounted for 3 of the 4 reported deaths.[1] A second review including 14 additional HS cases reported that 10/18 of patients were deceased (2 were of unknown status, 6 alive at time of writing, but some with ongoing or progressive disease).[2] Patients generally had disseminated disease at diagnosis, often involving the bone marrow, lymph nodes, bone, liver, spleen, and lung.[2] Case demographics, where reported, are notable for an even distribution of precursor lesions (10/22 T-ALL, 11/22 pre-B ALL), male predominance (16/18 of above, 21/24 cases in reviewed literature), and a short latency period after initial ALL diagnosis (range: 1 month to 14 years, median: 12 months).[2-4] This short latency period is interesting in that these histiocytic sarcomas frequently appear to be clonally related to their precursor lesion. Where examined, 12 of 13 cases had findings suggestive of clonality; including shared TCR/IgH rearrangements, shared chromosomal abnormalities, or findings suggestive of shared pro-oncogenic mutations.[2,3] This suggests that if these lesions are not in fact arising contemporaneously with the primary ALL, their rapid development may reflect the transformative effects of therapy-associated genotoxic stress on predisposed leukemia cells or a shared hematopoietic precursor population.

A more recent study of mutational profiling of histiocytic sarcomas following pediatric ALL suggests that CDKN2A and mitogen activated protein kinase (MAPK) pathway mutations may be common features of these lesions (3/4 lesions examined with CDKN2A del, 4/4 with MAPK pathway mutations in KRAS, NRAS, BRAF.[3] In one additional case, the authors report a “dramatic” initial response of a BRAFV600E HS to the MAPK pathway inhibitors dabrafenib and trametinib.[5] Given the lack of an effective standardized regimen for the treatment of HS, these findings suggest that more extensive profiling of these lesions for driving mutations in the MAPK therapy and targeted therapy is warranted and may benefit survival in future patients. Regarding our patient, phenotyping of his primary ALL was notable for absence of CDKN2A in most leukemic pre-B cells examined, with absence of p16 staining in HS cells, suggestive of a common loss of CDKN2A between lesions. His age, sex, primary diagnosis, and short latency window are likewise consistent with the reported literature, but his clinical course is distinct in its presentation with left hip pain and femoral head destruction/hip joint effusion mimicking osteomyelitis.

Conclusion / Outcomes

Unfortunately, our patient clinically deteriorated in the short interval between the onset of systemic symptoms and cytopenias, and the confirmation of his diagnosis. He developed progressive, acute respiratory failure with

repeat CT imaging demonstrating significant interval worsening of pulmonary and diffuse systemic disease. His critical status and poor prognosis were discussed with his family, and a shared decision was made to pursue palliative care only.

Case Clinical pearls

Histiocytic sarcoma is rare malignancy that, in children, often presents after a short interval window (months to 2-years) following initial diagnosis with pre-B or T ALL.[2-4]. Reported cases have occurred predominantly in male patients.[2,3] It may present similarly to a relapse without evidence of the primary ALL, but presentation may vary as in the case of our patient whose initial clinical features largely mimicked osteomyelitis.[2,3] Many of these lesions appear to be clonally related to the primary leukemia.[2,3] There is no established, effective chemotherapy regimen for this rare histiocytic malignancy, but recent reports suggest that MAPK pathway mutations may be a common, targetable feature of these lesions.[3,5]

Keywords: Secondary malignancy, ALL, osteomyelitis, Histiocytic sarcoma

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Prolonged Fever in a Middle School Child

Rachel George MD, Department of Pediatrics

Date of Resident Mid-Day Report Presentation: May 17, 2021

Case Description

A middle school aged male with no significant past medical history presented to the emergency department with fever for 8 days. Parents report that on day one he had a fever and nonspecific abdominal pain. Two days later the fever peaked at 102°F and he developed non-bilious non-bloody vomiting and diarrhea. The following day when he had a fever he went to an emergency department where he tested negative for SARS-CoV-2, influenza, and Streptococcus. He reported that he continued to have daily fevers and on day 7 he developed a cough, change of appetite, and loss of sense of taste. The following day he reported to our hospital. He denied any weight loss, rashes, or musculoskeletal pain.

When asked further about his infectious exposures he reported living in the northern part of Texas and denied travel or camping in the past six months. He had pet dogs and played with a neighborhood kitten. He denied any known insect or tick bites. He did not have any known sick contacts or exposures, but reported a family member who resided in his home traveled out of town regularly.

On exam the patient was febrile to 38.8°C (102°F), tachycardic (heart rate 120s) and tachypneic (respiratory rate 40). There were no murmurs on exam, lungs were clear to auscultation bilaterally without work of breathing, and his abdomen was soft, nontender, and without hepatosplenomegaly He did not have lymphadenopathy and his oropharynx was clear without exudates. He was noted to have a well healing eczematous rash on his right lower extremity and right upper back, along with a lacy discoloration on his bilateral arms, which family reported was normal for him. His tachycardia and tachypnea improved with defervescence.

Differential and Diagnostics

Fever of unknown origin has varied definitions, with the original definition per Petersdorf and Beeson's landmark study of adults in 1961 including 3 weeks duration, temperature of 38.3°C, and uncertain diagnosis after 1 week of workup.[5] Alternate variations lower the fever threshold limit to 38°C and duration to 14 days.[5] Given this, our patient presented with what would best be defined as a prolonged fever without a localizing source. Often these fevers are viral in nature for younger children, but for older children (> 6 yo), autoimmune or autoinflammatory process can be more common.[5]

Since the evaluation for a fever without localizing source can be extensive, taking a systematic approach is important. It can be helpful to differentiate diagnoses into categories of infectious and noninfectious.[1] For this patient the primary differential for infectious causes included Bartonella (for his cat exposure), Ebstein Barr Virus (EBV), Cytomegalovirus (CMV), and typhus. Noninfectious differential included leukemia/ lymphoma, inflammatory bowel disease, systemic lupus erythematosus, and multisystem inflammatory syndrome in children.

As with the differential, the workup can be vast and taking a systematic approach is important. For our patient we began by checking a comprehensive metabolic panel, complete blood count, inflammatory markers, monospot, respiratory viral panel, EBV antibodies, and Bartonella antibody. Additionally, to further evaluate for Multisystem Inflammatory Syndrome in Children (MISC), a SARS-CoV-2 antibody was obtained, ferritin, fibrinogen, LDH, and a D-dimer were checked. These were notable for mildly elevated AST (97) and ALT (114), mildly elevated CRP 3, but normal ESR. His MISC labs were notable for mildly elevated ferritin, fibrinogen, and LDH along with a D-dimer of 5.86. On review of his labs and his history our team had a higher suspicion for infectious cause than a noninfectious etiology given he did not meet true fever of unknown origin criteria (fever of only 8 days), he did not have any history or exam findings concerning for an autoimmune condition (such as rash, ulcers, or joint swelling) or an oncologic process (no weight loss, night sweats), and his lab workup did not show any leukopenia, leukocytosis, anemia, or abnormal cells. Additionally, his CRP was elevated, but not his ESR, indicating an acute reaction. It should be noted that despite these findings, the suspicion for malignancy or autoimmune condition should be high for fevers

approaching 4 weeks duration as some studies have shown rates as high as 40% in patient with this duration of fever without identifiable source.[5]

Given that the patient appeared well and had a positive monospot test, the team decided to hold on treating for MISC until his SARS-COV-2 antibodies returned, which were negative the following day. He continued to have a fever for two more days (maximum temperature 39.5°C) when his EBV and Bartonella titers returned negative. At this point the team consulted infectious disease. Further studies were sent to evaluate for CMV, Toxoplasmosis, Brucella, Rocky Mountain Spotted Fever, typhus, and gastrointestinal infection. Since the patient continued to have daily fevers and some of his studies would take days to return, he was given an empiric dose of doxycycline. His fevers resolved the following day and he was discharged on an empiric ten day course of doxycycline. His typhus antibodies returned positive.

Diagnostics and Diagnosis

Murine typhus, also known as endemic typhus or flea borne typhus, is spread from the passing of Rickettsia typhi (most commonly) from fleas. The bacteria live in the midgut of fleas and is shed through their feces. The fleas transmit the bacteria when their feces come in contact with broken skin from flea bites, scratches, or any other kind of injury. Animals such as cats, rats, and opossums serve as reservoirs for the bacteria.[3]

Murine typhus initially was identified in the early 20th century and peaked mid-century before declining with the usage of DDT. However the incidence has increased as the life cycle shifted from a flea-rat cycle to a flea-cat or flea-opossum cycle. It is commonly found in southern Texas, southwestern Gulf Coast, southern California, and Hawaii with peaks in June, July, and January.

Clinical presentation can vary among patients with the most common symptoms being fever, poor appetite, malaise, headache, rash, emesis, abdominal pain, myalgia, and cough. The common triad is fever, headache and rash, which is maculopapular and spreads from the trunk outwards and spares the palms and soles, distinguishing it from Rocky Mountain Spotted Fever. Symptoms also vary by age. For children less than 10 years old symptoms include rash, headache, malaise/ fatigue, myalgia, chills, sore throat, photophobia, and neck pain. Children 10 and older more commonly have the triad of fever, headache, and rash.

As with its symptoms, diagnostic clues vary including elevated inflammatory markers (CRP and ESR), hypoalbuminemia, hypokalemia, hyponatremia, elevated creatine of >1.3, and elevated AST and ALT. Cell count indices include leukopenia or leukocytosis, thrombocytopenia, and elevated neutrophils (greater than 56%). Urine studies may show hematuria and sterile pyuria.[6,9]

An indirect fluorescent antibody assay for Rickettsia typhi antigen can be performed to assess antibody titers. However this can be falsely low early in the illness (levels tend to peak around 4 weeks) and many serologic tests do not distinguish Rickettsia typhi from other Rickettsia species like Rickettisia rickettsia. For these reasons, it is important to repeat assays 2 to 4 weeks later and rule out other species. Additionally IgG titers are considered more accurate than IgM; IgM titers should not be used alone to assess.[4,10]

Conclusion

Some clues from our patient's initial workup included elevated CRP, elevated ALT and AST, and hypoalbuminemia. It is possible his symptoms would have resolved spontaneously as he was nearing two weeks of symptoms towards the end of his hospitalization. However, he reported feeling drastically better after one day with antibiotics.

In general children do not suffer from complications of murine typhus. However complications can include pneumonia, respiratory failure, meningitis, and shock.[4] To reduce the duration of symptoms and risk of complications, treatment includes doxycycline (most common), chloramphenicol, or ciprofloxacin.[4,10]

In conclusion, murine typhus is increasing in incidence and should be on the differential of children with prolonged fever, especially those living in Texas. Its clinical findings are varied as are its diagnostic clues, but it can be confirmed with antibody titers for Rickettsia typhi.

Case Clinical pearls

When contemplating a fever of unknown origin or prolonged fever without localized source, approach your differential with broad categories. Start with basic labs and broaden as needed. Consider murine typhus to be high on the differential for children in Texas who have prolonged fever with nonspecific symptoms.

Keywords: Fever of unknown origin, Prolonged fever, Murine typhus

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Infection or exposure?: A complex presentation of vaping induced lung injury in an adolescent female

Lydia Sandy MD, Department of Pediatrics

Date of Resident Mid-Day Report Presentation: October 2, 2020

Case Description

A 17 year old female with a past medical history significant for obesity, anxiety, constipation, and 2 recent hospital admissions for acute respiratory distress without clear etiology presented to Children's Medical Center Dallas Emergency Department (ED) with acute on chronic shortness of breath, severe chest pain, cough, increased work of breathing, and wheezing. Her shortness of breath started 9 months ago and progressively worsened over time. Her dyspnea was associated with increased work of breathing, wheezing, and cough that was occasionally productive of clear, "beady" and "mushy" sputum. She described the chest pain as "stabbing" or "pressure" in the middle of her chest that felt worse with deep breaths. None of these symptoms were relieved with bronchodilators. She also reported bilateral leg pain that felt like she had recently "exercised a lot." Associated symptoms included intermittent mild subjective fevers, back pain, fatigue, headaches, and swollen feet.

These symptoms were similar to those of her prior hospitalizations 1 and 3 months ago where she was diagnosed with atypical pneumonia with bronchospasm and restrictive eosinophilic lung disease of unknown etiology, respectively. Her previous workup was significant for progressively worsening ground glass opacities with patchy sparing on computed tomography (CT) chest and leukocytosis with eosinophilia. Her pulmonary function tests (PFTs) revealed a restrictive pattern with normal diffusing capacity for carbon monoxide (DLCO). Bronchoscopy with bronchoalveolar lavage (BAL) showed normal anatomy, minimal secretions, edematous mucosa, negative acid-fast bacilli culture, and 14-19% eosinophils. Coccidioides immunoglobuin M (IgM) was equivocal. Extensive cardiac, inflammatory, and infectious testing was negative. She was discharged home with steroids, which briefly improved symptoms.

The patient was born in Mexico and lived there until age 8 when she immigrated to Texas. She lived in an "old" apartment. She had a pet dog. She smoked marijuana 1-2 times per week for the last 4 years and vaped at least once a week for the last year. Her past medical history included obesity, anxiety, constipation, and a questionable history of childhood asthma. She had no previous surgeries or known allergies. Her grandmother died from "asthma" in her 20s and she had 2 cousins with asthma.

Upon presentation to the ED, the patient was in respiratory distress with tachypnea, bilateral biphasic wheezing, and oxygen saturations down to 90%. She was started on oxygen via nasal cannula at 2 liters per minute. She received 3 hours of continuous albuterol before starting the bronchodilator protocol. Initial workup was significant for a chest CT showing worsening scattered ground glass opacities, nodularity, and atelectasis throughout all lung fields with right hilar and mediastinal adenopathy. Complete blood count showed persistent leukocytosis with eosinophilia. She was admitted to the Pulmonary team and started on methylprednisolone 40 mg IV BID.

Differential and Diagnostics

The differential diagnosis for acute on chronic dyspnea is broad and includes pulmonary, cardiovascular, neuromuscular, musculoskeletal, hematologic, rheumatologic, and infectious pathologies. Prior to her third hospital admission, the patient already received an extensive workup that ruled out cardiac, hematologic, neuromuscular, and musculoskeletal etiologies. Key findings from her history and previous workup included scattered ground glass opacities, nodularity, and atelectasis on chest CT, a restrictive pattern on her pulmonary function tests, elevated eosinophils on BAL, persistent leukocytosis with eosinophilia, equivocal coccidioides IgM, and a history of possible chemical and infectious exposures. Given these pertinent findings, the differential diagnosis included acute eosinophilic pneumonia, allergic bronchopulmonary aspergillosis, cadmium toxicity causing chemical pneumonitis, chronic eosinophilic pneumonia, coccidioidomycosis, eosinophilic granulomatosis with polyangiitis, histoplasmosis, hypereosinophilic syndrome, hypersensitivity pneumonitis, Löffler syndrome, strongyloidiasis, vaping or drug induced lung injury, and

visceral larva migrans. Please see appendix for more information on features of these diagnoses.

Given the severity of her persistent symptoms without a clear source, Infectious Disease, Allergy and Immunology, and Toxicology teams were consulted to help determine the appropriate workup. Confirmatory coccidioides immunodiffusion testing was negative. Other infectious workup, including fungal and parasitic antibodies and ova and parasite analysis of stool and sputum remained negative, thus ruling out the most likely infectious etiologies described above. Lymphocyte subpopulations and immunoglobulins were unremarkable. The patient did not have other clinical findings or systems involved that would indicate eosinophilic granulomatosis with polyangiitis or hypereosinophilic syndrome, making these diagnoses unlikely. Cadmium blood and urine testing was negative.

The patient responded well to methylprednisolone infusions. She was weaned from oxygen and her dyspnea and chest pain improved. She continued to have leukocytosis while on steroids but eosinophilia completely resolved. Through a process of exclusion and by monitoring her good clinical response to steroids, the patient was diagnosed with a non-specific eosinophilic lung disease that could be caused by vaping or chronic eosinophilic pneumonia. In retrospect, this patient's presentation was consistent with E-cigarette or Vaping Product Use-Associated Lung Injury (EVALI). However, this case occurred early in the EVALI outbreak when its associated presentation and symptoms were not well defined.

Diagnostics and Diagnosis

EVALI is a severe lung illness related to the use of e-cigarette and vaping products. It was first described after an outbreak beginning in 2019 and, as of February 18, 2020, had been associated with over 2,800 cases and 68 deaths.[1] EVALI predominantly affects males (66% of reported cases). As of January 14, 2020, 82% of patients with EVALI report vaping THC contacting products. The median age at diagnosis is 24 years and 15% of cases have occurred in patients under 18 years old.[1]

EVALI is characterized by alveolar damage that leads to a significant inflammatory response.[2] Descriptions of pathologic findings vary but include acute fibrinous pneumonitis, organizing pneumonia (usually bronchiolocentric), acute eosinophilic pneumonia, diffuse alveolar damage, and lipoid pneumonia.[3,4,5,6] Given this spectrum of findings, EVALI may have multiple causes and mechanisms of pathogenesis. However, it is strongly linked to the inhalation of vaping products that include vitamin E acetate.[1,7,8]

Its diagnosis is complicated by its broad, non-specific symptoms whose severity may vary widely from patient to patient.[9] EVALI may present with respiratory symptoms (cough, shortness of breath, or chest pain), gastrointestinal symptoms (nasuea, vomiting, stomach pain, or diarrhea), or vague constitutional symptoms (fever, chills, or weight loss).[10,11] Patients may develop symptoms hours to weeks after use.

Due to its varied presentation and ability to mimic other conditions such as infections, it remains a diagnosis of exclusion. The CDC defines a confirmed case as the use of an e-cigarette (either through vaping or dabbing) in 90 days prior to symptom onset with the presence of pulmonary infiltrates on chest xray or ground-glass opacities on chest CT, absence of pulmonary infection on initial work-up, and no evidence of alternative plausible diagnoses.[12]

No specific treatment regimen has been proven most effective. However, corticosteroids and supportive care have provided significant clinical improvement. Treatment with corticosteroids is also associated with improvements in lung function.[9] Many institutions, including Children's Health, have developed diagnostic and treatment algorithms to help standardize care for all patients.[9] At this time, little is known about the long-term prognosis for patients with EVALI, making it an important area for future research.

Although little was known about EVALI at the time of this patient's presentation, she met the CDC definition for a confirmed case, thus providing a likely etiology for her eosinophilic pneumonia.[12,4] It took 3 months and multiple hospitalizations to reach the appropriate diagnosis and provide effective treatment. Despite the delay, she clinically improved with supportive care and systemic glucocorticoid therapy. Unfortunately, the patient did not have health insurance and was lost to follow up.

Conclusion

While the prevalence of EVALI has significantly declined over the past 1.5 years, it remains an important diagnosis to consider in a patient with a history of vaping who presents with respiratory, gastrointestinal, or constitutional symptoms. Additionally, this case highlights the importance of obtaining a thorough social history that includes information about vaping and dabbing.

Case Clinical pearls

EVALI is a severe lung illness related to the use of e-cigarette and vaping products that may present with respiratory, gastrointestinal, or constitutional symptoms. Obtaining a thorough social history, including information about vaping and dabbing, is essential to developing an accurate differential diagnosis.

Keywords: EVALI, vaping, lung injury, dyspnea, chest pain

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Appendix

Disease	Clinical Course	Diagnostic Findings	Imaging	Distinguishing Features
Acute eosinophilic pneumonia	• Acute	• BAL: Eosinophils • PFTs: Restrictive pattern; reduced DLCO • CBC: Neutrophilia, leukocytosis - Not usually associated with peripheral eosinophilia on presentation but develops approximately 7-30 days of onset • Elevated IgE	• Patchy infiltrates with Kerly B lines (early) • Diffuse parenchymal ground-glass opacities, interlobular septal thickening, consolidations, prominence along bronchovascular bundles	• Rapid clinical improvement with corticosteroids • Does not relapse after discontinuation of corticosteroids
Allergic bronchopulmonary aspergillosis (ABPA)	• Acute • Subacute • Chronic	• BAL: Eosinophils • PFTs: Obstructive pattern • Sputum: May contain black or brown mucus plugs containing fungal hyphae • CBC: Eosinophilia • Elevated IgE • *Aspergillus* specific IgE • Skin testing: reactive to aspergillus antigens	• Transient, irregular pulmonary infiltrates with predilection for upper lobes • Central bronchiectasis	• Occurs in response to allergic sensitization to antigens from *Aspergillus* species fungi • Consider ABPA in patients diagnosed with asthma that do not respond to standard therapies • Potential complication of cystic fibrosis
Cadmium toxicity causing chemical pneumonitis	• Acute	• Elevated urine cadmium level • Elevated blood cadmium level	• Patchy, ill-defined, homogenous shadowing [13] • Pulmonary edema	• Vapors released when cadmium is heated[13] • Cadmium may be present in some regulated e-cigarettes and vaping cartridges not approved by the Food and Drug Administration
Chronic eosinophilic pneumonia	• Subacute • Chronic	• BAL: Eosinophils • PFTs: Normal, obstructive, or restrictive pattern; reduced DLCO • CBC: Eosinophilia, leukocytosis • Elevated IgE	• Bilateral peripheral or pleural-based, nonsegmental, consolidative opacities described as the "photographic negative pulmonary edema"	• Rapid clinical improvement with corticosteroids • >50% relapse requiring prolonged corticosteroid treatment • Associated with asthma and allergies • Extrapulmonary manifestations: rhinitis, sinusitis
Coccidioidomycosis	• Acute • Subacute	• BAL: Eosinophils[14] • Sputum: Spherules visible after calcofluor staining • CBC: Eosinophilia or normal • Fungal culture: *Coccidioides* • Positive ELISA for *Coccidioides* IgM and IgG antibodies	• Unilateral dense infiltrate that may appear as a pulmonary nodule or cavity with ipsilateral hilar or mediastinal lymphadenopathy	• Endemic to southwestern United States and northern Mexico • Failure to improve with antibiotic therapy • Extrapulmonary manfiestations: erythema nodosum, erythema multiforme
Eosinophilic granulomatosis with polyangiitis (Chrug-Strauss syndrome)	• Acute • Subacute • Chronic	• BAL: Eosinophils • PFTs: Obstructive pattern • CBC: Eosinophilia, normochromic normocytic anemia • Elevated IgE • Hypergammaglobulinemia • Antineutrophil cytoplasmic antibodies positive • Antinuclear antibody positive • Rheumatoid factor positive • Normal or elevated complement levels	• Migratory bilateral, nonsegmental, patchy infiltrates • Reticulonodular and noduar disease without cavitation • Scattered patchy parenchymal opacities with ground-glass, nodular, consolidated, or tree-in bud appearance	• Eosinophilic vasculitis involving multiple end organs in the setting of asthma • Extrapulmonary manifestations: rhinitis, sinusitis, polyposis, migratory polyarthralgias, palpable purpura, skin nodules
Histoplasmosis	• Acute • Subacute • Chronic	• Fungal culture: *Histoplasma capsulatum* • Positive *Histoplasma* antigen testing from BAL samples	• Lobar or patchy pulmonary infiltrates • Mediastinal adenopathy • Calcified pulmonary nodules may be visible after resolution of infection	• Endemic mycosis found in North and Central America, particularly the Ohio and Miissisippi River valleys
Hypereosinophilic syndrome	• Subacute • Chronic	• BAL: Eosinophils • PFTs: Restrictive pattern • CBC: Eosinophilia • Tissue biospsy: Eosinophilia • Elevated IgE • Antineutrophil cytoplasmic antibodies negative	• Interstitial infiltrates, ground-glass opacities, small nodules	• Persisent eosinophilia with end organ damage or dysfunction • Extrapulmonary manifestations: infiltration of cardiac, GI, renal, hepatic, and musculoskeletal systems • >50% of patients do not respond to corticosteroids

Disease	Clinical Course	Diagnostic Findings	Imaging	Distinguishing Features
Hypersensitivity pneumonitis	• Acute • Subacute • Chronic	• BAL: Lymphocytosis • PFTs: Restrictive or obstructive pattern; reduced DLCO • CBC: Lymphocytosis with neutrophilia • Normal IgE	• Micronodular opacities, ground-glass opacities, centrilobular nodules (acute and subacute) • Reticular changes, traction bronchiectasis, subpleural honeycombing with sparing of lung bases (chronic)	• Inhalational exposure to inhaled antigens leads to an inflammatory response of the alveoli and small airways • Strong occupational and environmental history is essential for diagnosis
Löffler syndrome	• Acute	• BAL: Eosinophils, *Ascaris* or hookworm larvae • PFTs: Restrictive pattern; reduced DLCO • Sputum: Eospinophils, Charcot-Leyden crystals, *Ascaris* or hookworm larvae • CBC: Eosinophilia (peaks when respiratory symptoms resolve) • Elevated IgE • Gastric aspirate: *Ascaris* or hookworm larvae • O&P: Negative until approximately 8 weeks after onset of respiratory syndrome	• Migratory, bilateral, interstitial, and peripheral alveolar inflitrates	• Usually occurs in areas with poor sanitation • Fecal-oral infection • Hypersensitivity reaction caused by the movement of larvae from the small intestine through the circulation to the alveoli. Helminths mature within alveoli before ascending into large airways where they are swallowed back into GI tract. • Usually self-limited
Strongyloidiasis	• Acute • Chronic	• BAL: Eosinophils, *Strongyloides stercoralis* larvae • CBC: Normal or eosinophilia between flares • Elevated IgE • O&P: *Strongyloides stercoralis* larvae • Positive ELISA for *Strongyloides* IgG antibody	• Patchy pulmonary infiltrates	• Endemic to tropical and subtropical regions • Transcutaneous infection • Löffler-like syndrome as larvae migrate through the lungs • Chronic strongyloidiasis is caused by autoinfection when larvae become infectious within GI tract, penetrate the colonic wall or perianal skin, and reinfect the host repeatedly • Consider this in patient with recurrent asthma-like symptoms that worsen with administration of corticosteroids • Extrapulmoanry manifestations: abdominal pain, nausea and vomiting, larva currens, pruritis
Vaping or drug induced lung injury*	• Acute • Subacute	• BAL: Eosinophils, elevated neutrophils, lipid laden macrophages • PFTs: Restrictive pattern • CBC: Eosinophils • Remaining workup negative	• Bilateral infiltrates with occasional subpleural sparing • Diffuse ground-glass opacities with air bronchograms	• Must have used an e-cigarette (either through vaping or dabbing) in 90 days prior to symptom onset • Alveolar damage leads to a significant inflammatory response • Strongly linked to the inhalation of vaping products that include vitamin E acetate • Extrapulmoanry manifestations: Nasuea, vomiting, stomach pain, diarrhea
Visceral larva migrans	• Acute • Chronic	• BAL: Eosinophils • CBC: Eosinophilia, leukocytosis • O&P: Negative • Elevated IgE • Hypergammaglobulinemia • Positive ELISA for *Toxocara* IgG antibody	• Bilateral peribronchial or parenchymal infiltration • Diffuse, subpleural nodules with halo or ground glass opacities with poorly defined margins	• Infection by ingesting *Toxocara* infective eggs found in soil and animal feces (especially from puppies) • Often affects young children • Larvae penetrate intestinal mucosa and disseminate hematogenously to lungs, liver, and central nervous system, thus eliciting an eosinophilic granulmoatous response • Extrapulmonary manifestations: hepatomegaly, rashes, unilateral visual impairment

*Now called E-cigarette or Vaping Product Use-Associated Lung Injury (EVALI). BAL, Broncheoalveolar lavage; CBC, complete blood count; DLCO, diffusing capacity for carbon monoxide; ELISA, enzyme-linked immunoassay; GI (gastrointestinal); IgE, immunoglobulin E; IgG, immunoglobulin G; IgM, immunoglobulin M; IgG, immunoglobulin G; O&P, ova and parasite stool study; PFTs, pulmonary function tests.

In addition to above citations, Appendix compiled with information from Fishman et al., Fishman's pulmonary diseases and disorders 2015, Fifth Edition, 2015[15] and Loscalzo et al., Harrison's principles of Internal Medicine 2022.[16]

UTSW JOURNAL OF PEDIATRICS

Case Report: Complications of Thyroid Storm in a 16 year old Female

Karin Claussen MD, Department of Pediatrics

Date of Resident Mid-Day Report Presentation: May 5, 2020

Case Description

A 16-year-old female with a history of Graves' disease presented to the emergency department with one day of altered mental status and weakness. She had difficulty remembering recent actions, confusion, and agitation. The weakness was generalized and progressed to inability to ambulate. Other notable findings included subjective fever for one day, progressive fatigue, weight gain of 3 kg in three months, palpitations, and generalized abdominal pain. There were no reported concerns of ingestion or trauma per grandfather. She was diagnosed with Graves' disease three months prior, and she described "feeling like I did the first time." She was prescribed methimazole 25 mg BID and atenolol 25 mg BID yet reported inconsistent use. Her last dose of methimazole was the day prior to presentation. Before her diagnosis of Graves' disease, she was healthy with no previous surgeries. Her mother and half-sister also shared diagnoses of Graves' disease. She received all age-appropriate vaccinations. Social history was pertinent for living with her grandparents as her primary guardians. However, the patient was with her uncle the week prior and returned to grandfather the day before presenting to medical care.

On initial physical exam she was ill appearing and lethargic with a temperature of 40.1°C, blood pressure of 130/38 mm Hg, heart rate of 170 beats/minute, respiratory rate of 55 breaths/minute, and oxygen saturation of 97% on room air. She demonstrated orientation to self but agitation and incoherent speech with a GCS of 15. She had warm extremities and brisk capillary refill. Ears, nose, and throat examination showed bilateral tonsillar exudate, moist mucous membranes, and an enlarged thyroid (9x6 cm) with a bruit and no nodules. The cardiac exam was significant for tachycardia, no murmurs, and bounding pulses. The respiratory exam had tachypnea with symmetric chest rise and clear breath sounds bilaterally. The abdomen was diffusely tender with generalized guarding but remained soft without hepatosplenomegaly.

Laboratory assessment included white blood cell count of 0.6/µL with an absolute neutrophil count (ANC) of 0/µL (no prior baseline established), a hemoglobin level of 12.1 g/dL, and a platelet count of 187 x 10^3/µL. Her chemistries were notable for sodium 127 mEq/L, potassium 3.8 mEq/L, and glucose 132 mEq/dL. Urine pregnancy test was negative. Endocrinology labs included thyroid stimulating hormone <0.008 µU/mL, free T4 8.95 ng/dL, and T3 428 ng/dL. A rapid strep A screen was positive. Venous blood gas had a pH 7.39, pCO_2 38 mmHg, pO_2 23 mmHg, HCO_3 22 mEq/L, base excess -2 mmol/L, and lactate of 2.61 mmol/L. Cardiac studies were notable for BNP 766.5 pg/mL (normal <100 pg/mL), troponin I 0.627 ng/mL (normal <0.1 pg/mL), and sinus tachycardia on electrocardiogram. Urine drug screen was negative. Imaging studies obtained were significant for an unremarkable CT head and mild cardiomegaly noted on CT abdomen/pelvis. She was given piperacillin-tazobactam, a total of 3 liters normal saline boluses, intravenous (IV) propranolol, IV solumedrol, and IV norepinephrine infusion prior to transfer to the pediatric critical care unit.

Differential and Diagnostics

On admission, she met criteria for severe sepsis and was managed with IV vancomycin and IV piperacillin-tazobactam given her neutropenic state. Meningitis was considered as a diagnosis; however, spinal fluid analysis was not pursued given her tenuous hemodynamics. Instead, her piperacillin-tazobactam was later changed to meropenem for improved central nervous system penetration. Her unremarkable CT head and negative toxicology work up reassured against trauma, mass, hemorrhage, or ingestion as etiologies for her acute neurologic decompensation. Her Burch-Wartofsky Score was 110, and >45 is highly suggestive to thyroid storm (Table 1).[1] Thus, her altered mental status was suspected as secondary to thyroid storm, although she continued to receive antibiotics for sepsis and meningitis.

Her treatments for thyroid storm included esmolol infusion, hydrocortisone, cholestyramine, and enteral potassium iodide. Propylthiouracil and methimazole were contraindicated in the setting of agranulocytosis. She remained tachycardic with these interventions, which was attributed to thyroid storm, although septic shock was

considered. While beta-blockade can lead to a precipitous drop in cardiac output in septic shock due to poor contractility from myocyte inflammation, there was high clinical suspicion for thyroid storm with supportive findings on the physical exam and laboratory values.[2]

Shortly upon arrival to the pediatric critical care unit, she experienced complete atrioventricular dissociation from beta blockade, which progressed to pulseless electrical activity. This occurred about 3 hours after IV propranolol and 30 minutes after initiation of the esmolol infusion. She received six minutes of cardiopulmonary resuscitation prior to achieving return of spontaneous circulation. A follow up echocardiogram demonstrated severely diminished left ventricular function and moderately diminished right ventricular function with a shortening fraction of 16%. This complication prevented further usage of beta-blockade for symptomatic treatment of thyroid storm.

Her agranulocytosis and severely diminished cardiac output left few therapeutic options to treat her thyroid storm. While she was continued on hydrocortisone, cholestyramine, and enteral potassium iodide, these measures were insufficient in addressing the severity of her symptoms. Additionally, thyroidectomy remained contraindicated until she achieved a euthyroid state. However, therapeutic plasmapheresis (TPE) was indicated to treat thyroid storm if there is no improvement in 24-48 hours of standard therapy, severe or worsening symptoms, or significant contraindications to other therapies.[3]

She met criteria for TPE for thyroid storm with significant contraindications to other therapies and received two rounds of plasmapheresis with dramatic improvement in her hemodynamic status. After her first round of TPE, T3 and FT4 improved to 281 ng/dL and 3.68 ng/dL, respectively and T3 and FT4 174 ng/dL and 2.78 ng/dL, respectively, after the second round. She was rapidly weaned from vasoactive support, had normalization of cardiac function on echocardiogram, and was weaned off cholestyramine and hydrocortisone. She resumed atenolol after normalization of her cardiac function which also treated newly developed hypertension. She received three doses of filgrastim with subsequent normalization of her ANC. While TPE can be used as a salvage therapy for multi-organ dysfunction in septic shock, her subsequent rapid improvement in hemodynamics after TPE was attributed to thyroid hormone removal.[4] Despite this, she completed a seven-day course of broad-spectrum antibiotics for culture-negative sepsis. Nine days after presentation, she was able to successfully undergo a thyroidectomy, after which atenolol was discontinued. She was initiated on Synthroid and calcitriol prior to discharge to a rehabilitation inpatient facility.

Diagnostics and Diagnosis

Thyroid storm is thyrotoxicosis plus severe life-threatening symptoms, such as altered mental status, hyperpyrexia, and cardiovascular dysfunction.[1] In the United States, the incidence of thyroid storm is 0.57-0.76/10,000 in patients ≥ 18 years old with an unknown pediatric incidence.[5] While rare, the mortality is >10% and commonly (45%) presents within the first year of hyperthyroidism diagnosis.[6] It is typically associated with a precipitating trigger such as irregular use or discontinuation of antithyroid drugs (41%) and infection (29%), both of which were demonstrated in this case.[6] Streptococcal infection was suspected as a common infectious trigger in prior case series, theoretically due to streptococcal infection causing over-induction of thyroid receptor antibodies (TRAb).[7]

In addition to the rarity of thyroid storm, this case is noteworthy due to limited therapeutic options available after contraindications arose, necessitating the rare use of TPE for pediatric thyroid storm. Thyroid storm typically has several therapeutic options available due to the systemic effects of thyroid hormone. These options include blocking thyroid hormone synthesis (thioamides), preventing thyroid hormone release from the thyroid (potassium iodide), inhibiting conversion of T4 to T3 (glucocorticoids, propranolol, propylthiouracil), impeding intestinal reabsorption (cholestyramine), treating symptoms caused by beta-adrenergic stimulation (beta-blockers), and in the case of Graves' Disease, tampering the autoimmune stimulation to the thyroid (glucocorticoids) (Figure 1).[3, 8]

Thioamides such as methimazole and propylthiouracil are first line medications for thyroid storm. However, these medications can cause agranulocytosis (ANC<500), which occurs at a 0.1-0.3% incidence. Filgrastim can shorten the neutrophil recovery time from an average of six days to ten.[9] In this patient, the ANC recovered at ten

days with filgrastim treatment.

Secondly, beta blockers are used in thyroid storm to alleviate symptoms caused by thyroid-induced increased beta-adrenergic tone, such as palpitations, tachycardia, tremulousness, anxiety, and heat intolerance. Propranolol, a beta-1 and beta-2 blocker, has historically been used as the first line beta blocker for treatment of thyroid storm because it also inhibits the conversion of T4 to T3 over the course of seven to ten days. However, the half-life of propranolol is two hours, which limits flexibility to rapidly titrate doses. Evidence from Japan suggests a shorter acting beta-1 selective blockade has decreased mortality, augments cardiac output with continued beta-2 adrenergic effects, and allows for more rapid titration. Esmolol and Landiol are commonly used in this setting with half-lives of about four minutes. Control of tachycardia often leads to improvement of cardiac output, yet judicious use is required because beta blockade can lead to a precipitous decline in cardiac output if there is confounding decompensated heart failure.[10]

Lastly, TPE is helpful in thyroid storm as demonstrated in case series. It removes and exchanges serum proteins that bind 99% of thyroid hormone and is theorized to also remove catecholamines and thyroid stimulating immunoglobulin. Replacement fluid can be fresh frozen plasma (FFP) or albumin. FFP is preferred because it also contains thyroid binding globulin, augmenting the thyroid hormone removal process. It is recommended to continue TPE daily until clinical improvement is observed and FT3/FT4 levels have declined.[3]

Conclusion / Outcomes

This patient has done well since hospital discharge. She spent two weeks in a rehabilitation hospital regaining strength with physical, occupational, and speech therapists. She continued home exercises and has regained her prior functionality. Additionally, she was managed on Synthroid after her thyroidectomy and has remained euthyroid on this regimen. Medication adherence has improved since this illness, and she had regular visits with endocrinology prior to turning 18 years old.

Although rare, thyroid storm is a "cataclysmic metabolic crisis with multi-system dysfunction and high associated mortality rate."[1] This multimodal disease requires careful pharmacologic considerations and potentially TPE if initial interventions are unsuccessful. For this index patient, additional perspectives on other pertinent aspects to her treatment including goals of care and multidisciplinary collaboration can be helpful to explore, especially given the rarity of this disease.[11]

Case Clinical pearls

Thyroid storm, while rare in the pediatric population, has a high mortality rate. A large majority of these cases (45%) occur within the first year of hyperthyroidism diagnosis, so reiteration of medication adherence can potentially be lifesaving.[6] Treatment requires multiple modalities to target different nodes of thyroid synthesis and circulation as well as symptomatic effects of enhanced beta-adrenergic tone. Thioamides can cause agranulocytosis, and fever in this setting should be worrisome for sepsis in a neutropenic state. It is also important to determine cardiac contractility prior to starting longer-acting beta blockade, and if unsure, a shorter acting beta-1 selective blockade is less likely to cause patient harm. Therapeutic plasmapheresis can successfully treat thyroid storm in cases with no improvement after 24-48 hours of traditional therapy, severe or worsening symptoms, or significant contraindications to other therapies.[3]

Keywords: Thyrotoxicosis, Grave's Disease, Plasmapheresis, Heart Failure, Medication-induced agranulocytosis

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Additional notes: A prior case report about this patient has been written and published (reference [11])

Table 1. Burch-Wartofsky Diagnostic Criteria for Thyroid Storm1

Thermoregulatory Dysfunction - Temperature		**Cardiovascular Dysfunction - Tachycardia**	
Category	Points	Category	Points
99 °F-99.9 °F	5	90-109 bpm	5
100 °F-100.9 °F	10	110-119 bpm	10
101 °F-101.9 °F	15	120-129 bpm	15
102 °F-102.9 °F	20	130-139 bpm	20
103 °F-103.9 °F	25	≥140 bpm	25
≥104.0 °F	30		
Central Nervous System Effects		Cardiovascular Dysfunction – Heart Failure	
Category	Points	Category	Points
Absent	0	Absent	0
Mild (Agitation)	10	Mild (Pedal Edema)	5
Moderate (Delirium, Psychosis, Extreme Lethargy)	20	Moderate (Bibasilar Rales)	10
Severe (Seizure, Coma)	30	Severe (Pulmonary Edema)	15
		Atrial Fibrillation	10
Gastrointestinal-Hepatic Dysfunction		Precipitant History	
Category	Points	Category	Points
Absent	0	Negative	0
Moderate (Diarrhea, Nausea/Vomiting, Abdominal Pain)	10	Positive	10
Severe (Unexplained Jaundice)	20		

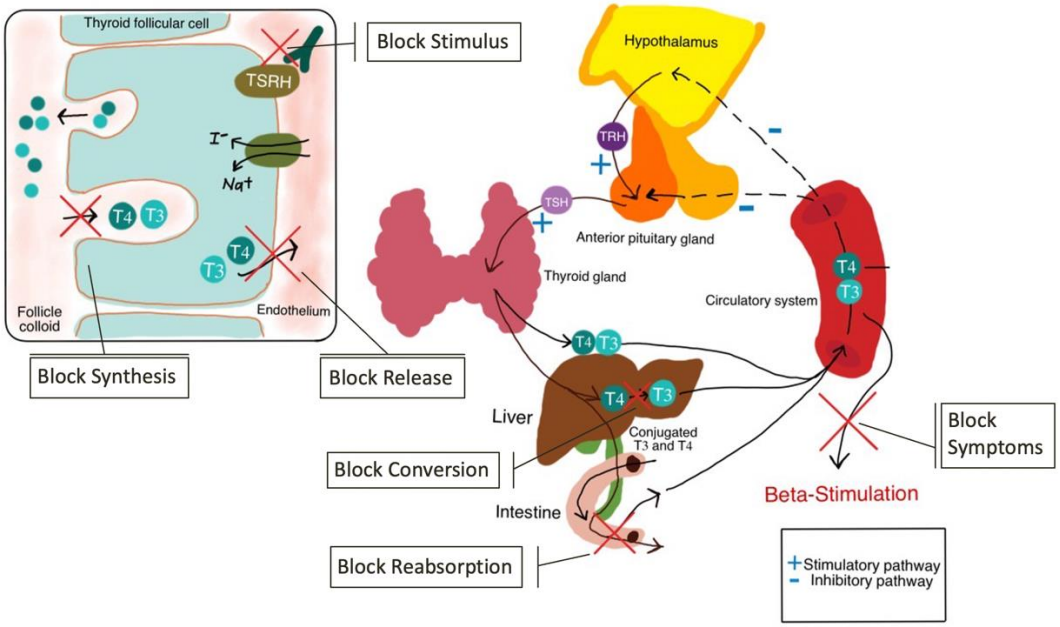


Figure 1. Adapted image[8] denoting therapeutic mechanisms available to treat thyroid storm

10TH ANNUAL SCHOLARLY SYMPOSIA POSTERS

Platform Presentation: Elena Chen MD - Impact of Simulation Curriculum on Pediatric Resident Comfort with High Acuity Clinical Situations and Crisis Management Skills

Primary mentor name	Claussen, Karin
Primary mentor's department / division	Pediatrics
Authors	Elena Chen, Dept of Pediatrics; Maria Petrozzi, Dept of Pediatrics; Karin Claussen, Dept of Pediatrics
Scholarship category	Education
Study Purpose	Improve resident comfort in stabilization of critically ill children by implementing a longitudinal curriculum that emphasize procedural skill stations, rapid cycle practice SIM and traditional SIM
Key findings:	Longitudinal SIM curriculum can be an effective educational model to improve pediatric resident comfort in high acuity clinical scenarios. Repetition appears to be important to maintain trainee comfort in high acuity clinical scenarios for both procedural skills and crisis management skills.

Impact of Simulation Curriculum on Pediatric Resident Comfort with High Acuity Clinical Situations and Crisis Management Skills

Elena Chen, MD[1] Mariagrazia Petrozzi, MD[1] Karin Claussen, MD[2]
[1]Children's Health, Dallas, TX [2]University of Texas Southwestern Medical Center, Dallas, TX

Background

- Simulation based training is standard in many high-risk fields like aviation, the armed forces and nuclear power plants[1]
- Shown to maximize safety and minimize risk[1]
- Common training tool in surgical and emergency medicine residencies
- Underutilized in pediatric medicine
- Pediatric residents are often uncomfortable with resuscitation skills due to relatively lower prevalence of critically ill children[2]
- This sentiment is anecdotally reflected at CMC

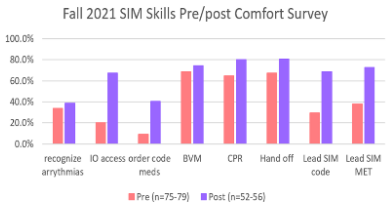
Objective

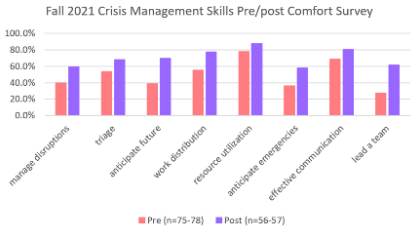
- Improve resident comfort in stabilization of critically ill children by implementing a longitudinal curriculum that emphasize procedural skill stations, rapid cycle practice SIM and traditional SIM

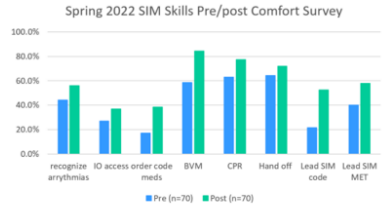
Methods

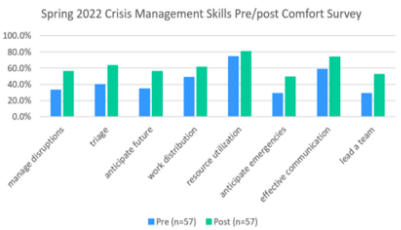
- Residents participated in high acuity clinical SIM cases (e.g. trauma, code events)
- SIM cases administered in small didactic groups once a semester
- Pre/post participation surveys completed to evaluate comfort with SIM and crisis management skills on a Likert scale
- Survey answers tracked for trainees of all levels over 2021-2022 academic year

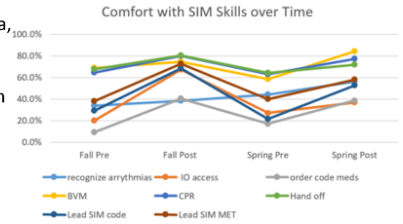
Results











Resident Comments

"Very helpful SIMs, I enjoyed both the opportunity for rapid repeat and for more formal SIMs."

"I love simulation days! Actively applying knowledge is how I learn best. You all create a great learning environment, free of judgement or shame."

Discussion

- Longitudinal SIM curriculum can be an effective educational model to improve pediatric resident comfort in high acuity clinical scenarios
- Repetition appears to be important to maintain trainee comfort in high acuity clinical scenarios for both procedural skills and crisis management skills

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- Thank you to UTSW faculty who ran the rapid cycle SIM—Drs. Pamela Okada, Ngoc Van Horn, Geoffrey Lowe, Erin Tresselt and Jamie Weller

Platform Presentation: Justin Williams MD - Clostridiodes difficile colonization in patients admitted to a gastroenterology inpatient service

Primary mentor name	Gurram, Bhaskar
Primary mentor's department / division	Gastroenterology
Authors	Justin Williams, Department of Pediatrics*; Alex Wright, Department of Pediatrics*; Bhaskar Gurram, Division of Gastroenterology
Scholarship category	Clinical
Study Purpose	The C. diff cell cytotoxicity assay (CCTA) has become an ultrasensitive test in adult medicine to rule in or out active infections while reducing hospitalization and antibiotic exposure. Due to the paucity of data evaluating the assay in pediatric medicine, we sought to perform a retrospective review in evaluating the utility of CCTA in optimizing these outcomes as well as in other more susceptible populations such as in IBD.
Key findings:	When comparing outcomes for stool panel testing (n= 31) with and without subsequent CCTA, there were no significant difference between length of hospitalization (15.4 and 9.9 days respectively; p = 0.63) and antibiotic therapy length (14.3 and 24.4 days; p = 0.19). Among patients with an obtained CCTA (n= 24), a positive (41.7%) or negative result had no significant difference between hospitalization length and antibiotic therapy. In a sub analysis between IBD and non-IBD patients, more patients in the IBD group had a negative CCTA than those without an IBD diagnosis (p=0.045). There was no significant difference in length of hospitalization or duration of antibiotic therapy between the IBD and non-IBD groups. Additionally, CCTA was positive among 60% of patients with ulcerative colitis who underwent colectomy

Does adding C. difficile cell cytotoxicity assay to PCR have impact on duration of antibiotic therapy and hospitalization?

Williams, J., Wright, A., Gurram, B.
Children's Medical Center/UT Southwestern Medical Center, Dallas, TX

children'shealth
Children's Medical Center
UTSouthwestern

Background

- Clostridioides difficile infection (CDI) places a significant burden on the US healthcare system.
- Infectious Diseases Society of America recommends a two-stage testing to confirm CDI.
- We at Children's Medical Center use a highly sensitive polymerase chain reaction (PCR)-based assays for detection of the C. difficile gene encoding toxin B.
- A positive PCR assay result does not necessarily indicate toxin production, a pre-requisite for CDI. Moreover, there is a high incidence of colonization of C. difficile in children
- C. difficile cell cytotoxicity assay (CCTA) is a sensitive and specific test for detection of C. difficile toxin in the stool, thus differentiating colonization from those with CDI.
- There is a paucity of data evaluating the CCTA's role in altering clinical outcomes (e.g. length of hospitalization, antibiotic exposure) in the pediatric population.

Aims and Design

- We performed a retrospective review of patients admitted to an inpatient gastroenterology service from Jan 1st 2020 to Dec 31st 2020 who had a diagnosis of CDI.
- We collected demographic information, comorbidities, C. difficile PCR testing and CCTA, lab workup, duration and type and duration of antibiotic therapy.
- Further analysis regarding CCTA positivity was performed to compare results of the previously clinical outcomes between patients with and without IBD.

Results

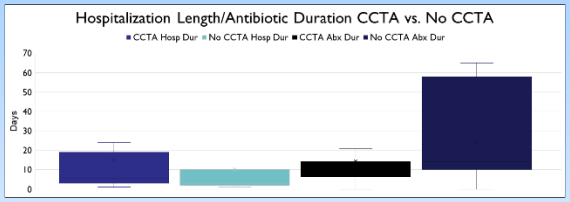


Figure 1: Hospitalization length and antibiotic duration comparison for CCTA vs. No CCTA

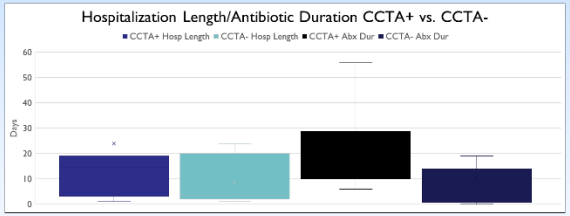


Figure 2: Hospitalization length and antibiotic duration comparison for CCTA+ vs. CCTA-

	CCTA+	CCTA-	Total
IBD Group	3	10	13
Non-IBD Group	7	4	11
Total	10	14	24

Table 1: CCTA positivity in IBD vs. non-IBD patients

Results (continued)

- When comparing outcomes for stool C. difficile PCR testing (n= 31) with and without subsequent CCTA (Figure 1), there were no significant difference between length of hospitalization (15.4 and 9.9 days respectively; p = 0.63) and antibiotic therapy length (14.3 and 24.4 days; p = 0.19).
- Among patients who had CCTA testing (n= 24), a positive (41.7%) or negative result had no significant difference between hospitalization length or duration of antibiotic therapy (Figure 2).
- In a sub analysis between IBD and non-IBD patients (Table 1), more patients in the IBD group had a negative CCTA than those without an IBD diagnosis (p=0.045).
- There was no significant difference in length of hospitalization or duration of antibiotic therapy between the IBD and non-IBD groups.
- Additionally, CCTA was positive among 60% of patients with ulcerative colitis who underwent colectomy

Conclusions

- Although CCTA helps in identifying children with C. difficile colonization, it does not result in change in the duration of hospitalization or antibiotic therapy.
- Our results indicate high degree of colonization (41.7%) among pediatric patients admitted with diarrhea to the GI unit. Colonization is higher (77%) among patients with IBD.
- Follow up CCTA for IBD patients could help in directing their management.
- An expanded analysis of additional populations outside of the gastroenterology service could help to improve the power of future studies.

Best Academic Presentation: Elliott Huang MD MPH - Clinical Characteristics of Pediatric Patients with Rhabdomyolysis: a 10 Year Retrospective Review

Primary mentor name	**Agharokh, Ladan**
Primary mentor's department / division	Pediatrics/Hospitalist medicine
Authors	Elliott Huang, Dept of Pediatrics; Ladan Agharokh, Department of Pediatrics, Division of Pediatric Hospital Medicine
Scholarship category	Clinical
Study Purpose	Examine patients hospitalized with rhabdomyolysis and evaluate the relationship between levels of serum creatine kinase and length of stay. Determine the relationship between level of serum creatine kinase and development of acute kidney injury and renal failure.
Key findings:	Patients with higher levels of serum creatine kinase have a longer hospital length of stay. The degree of elevation of serum creatine kinase does not correlate with the risk of development of kidney injury. The incidence of acute renal failure due to rhabdomyolysis is very low.

Clinical Characteristics of Pediatric Patients with Rhabdomyolysis: a 10 Year Retrospective Review

UTSouthwestern Medical Center

Elliott Y Huang, MD, MPH[1] Ladan Agharokh, MD[2]

[1]Pediatrics, Children's Medical Center, Dallas, TX; [2]Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

children's health

Background

- Rhabdomyolysis is a disease that, while uncommon, is seen regularly in the inpatient setting.
- Acute kidney injury leading to acute renal failure requiring renal replacement therapy (RRT) is a feared complication.
- Serum creatine kinase is often used as a marker of the severity of rhabdomyolysis, though no association has been shown between CK level and risk of development of renal failure.

Objectives

- Examine patients hospitalized with rhabdomyolysis and evaluate the relationship between levels of serum creatine kinase and length of stay.
- Determine the relationship between level of serum creatine kinase and development of acute kidney injury and renal failure.

Methods

Define sample population

- 153 unique patients were admitted to inpatient services between January 1, 2011 and December 31, 2020 with the primary diagnosis of rhabdomyolysis.
- 26 patients were excluded for the following reasons: underlying metabolic disease (10), underlying muscle disorder (6), chronic kidney disease (6), complex medical history (3), height error (2).

Determining acute kidney injury

- Using an assumed creatinine clearance of 120, baseline creatinine was calculated using patient height and the Revised Schwartz Equation.
- Acute kidney injury was defined using the pRIFLE criteria (decrease in creatinine clearance by 50%).

Statistical Analysis

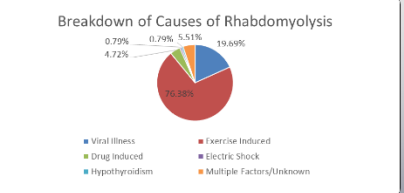
- Performed a Pearson correlation for length of stay vs logarithm of peak serum creatine kinase.
- Performed a logistic regression for AKI vs logarithm peak CK, corrected for sex and age.

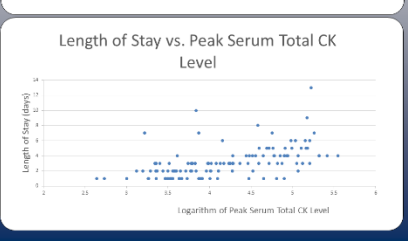
Patient Characteristics

Variable	Study Population (N=127)	AKI (N=68)	No AKI (N=59)
Age, yrs			
Mean (SD)	13.81 (3.61)	15.69 (1.86)	11.64 (3.9)
Median (range)	15 (3-18)	16 (6-17)	12 (3-18)
Sex, n (%)			
Male	102 (80)	57 (84)	45 (76)
Female	25 (20)	11 (16)	14 (24)
NSAID Use, n (%)			
Yes	23 (18)	10 (15)	13 (22)
No	104 (82)	58 (85)	46 (78)
Alkalinization of Urine, n (%)			
Yes	33 (26)	19 (28)	14 (24)
No	94 (74)	49 (72)	45 (76)
Number of Fluid Boluses[1] (SD)	1.74 (1.16)	2.05 (1.19)	1.39 (1.02)
Maximum Rate of IV Fluids[2] (SD)	1.75 (0.58)	1.75 (0.74)	1.74 (0.34)

1*(bolus defined by 20 mL/kg, IL maximum)
2*(multiplier of maintenance rate)

Results





- 9 patients admitted who initially did not present with acute kidney injury developed acute kidney injury during admission; none required renal replacement therapy
- 11 patients required PICU level care; all were admitted initially to the PICU
- 1 patient required renal replacement therapy (0.79% of patients) and presented to CMC with renal failure
- Based on the Pearson correlation coefficient, there was large positive correlation between peak serum creatine kinase and length of stay (r=0.54, P-value=0.00025).
- We did not observe a statistically significant association between peak serum creatine kinase and acute kidney injury after adjusting for age and sex (p-value = 0.39).

Conclusion

- Patients with higher levels of serum creatine kinase have a longer hospital length of stay.
- The degree of elevation of serum creatine kinase does not correlate with the risk of development of kidney injury.
- The incidence of acute renal failure due to rhabdomyolysis is very low.

Next Steps

- Recruit a larger sample population; consider reaching out to other institutions to increase the sample size.
- Create a tool to identify the risk of developing acute kidney injury in rhabdomyolysis that is applicable to the pediatric population.
- Establish a standardized treatment protocol for rhabdomyolysis that includes fluid management guidelines and criteria for discharge.

Best Academic Presentation: Zachary Stone MD - An Introduction to Healthcare Program for Local High School Students

Primary mentor name	Villani, Mary
Primary mentor's department / division	Pediatrics/Hospital Medicine
Authors	Zachary Stone, Department of Pediatrics; Mary Villani, Department of Pediatrics, Division of Hospital Medicine
Scholarship category	Education
Study Purpose	To create an easily-accessible, online program for high school students, which discusses the basics of healthcare and medicine in a didactic and case-based format
Key findings:	We have created a prototype for an online program to provide local high school students with an experience that allows students to engage with healthcare professionals. The program teaches students the fundamentals of physiology and basic disease processes through an engaging, hybrid model of didactics and cases. This program gives high school students an enriching experience to help guide their decision-making process regarding their interest in a healthcare related profession.

An Introduction to Healthcare Program for Local High School Students

UT Southwestern Medical Center

Zachary Stone, MD[1] Mary Villani, MD[1]

[1]Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

children's health

Background

Many high school students aspire to become physicians, nurses, or other healthcare workers as a future profession, but most have not had any exposure to the field. High school students regularly choose their focus of study at college based on these perceived interests. When these students apply for healthcare-related graduate programs, many have not had an opportunity to explore the healthcare field to validate their interests. High schools should be able to provide opportunities for their students to probe their interests in healthcare professions.

Objective

To create an easily-accessible, online program for high school students, which discusses the basics of healthcare and medicine in a didactic and case-based format

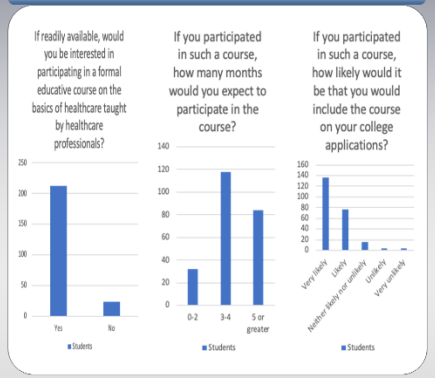
Methods

Needs Assessment
- Current need for a program
- Anticipated time commitment
- Inclusion on college applications

Modules
- Online recorded videos with whiteboard
- Didactic and Case-based
- Organized by physiologic system and disease process

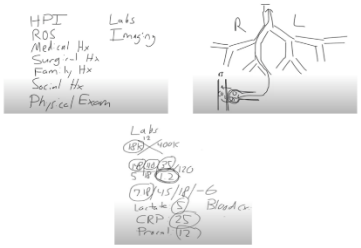
Post-course Evaluation
- Appropriate level of difficulty
- Fulfilled desired outcome
- Future interest

Needs Assessment

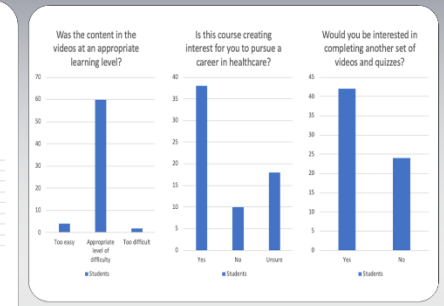


Modules

- 1st video: H&P Format
- 2nd video: Pulmonology and Pneumonia
- 3rd video: Pneumonia Case
- Quizzes after modules



Post-Course Evaluation



Discussion

We have created a prototype for an online program to provide local high school students with an experience that allows students to engage with healthcare professionals. The program teaches students the fundamentals of physiology and basic disease processes through an engaging, hybrid model of didactics and cases. This program gives high school students an enriching experience to help guide their decision-making process regarding their interest in a healthcare related profession.

Next Steps

Due to the online nature of the course, it should be relatively easy to increase the number of local high school students in the program. Other areas of growth include increasing the number of videos, creating an in-person/online hybrid format, and including other healthcare professionals in the program as educators.

Averi Wilson MD - Development, Implementation, and Evaluation of a Resident Telemedicine Curriculum

Primary mentor name	Walsh, Jennifer
Primary mentor's department / division	Internal Medicine/Pediatrics
Authors	Averi Wilson MD, Departments of Internal Medicine and Pediatrics; Mozhu Li MD, Department of Internal Medicine; Nicholas Lee MD, Departments of Internal Medicine and Pediatrics; Jennifer B. Walsh MD, Departments of Internal Medicine and Pediatrics; and Rachel Bonnema MD, Department of Internal Medicine
Scholarship category	Clinical
Study Purpose	We sought to develop, implement, and evaluate a virtual telemedicine curriculum for over 180 Internal Medicine residents.
Key findings:	Our single session virtual telemedicine curriculum was effective for improving resident confidence and knowledge surrounding telehealth-based care.

Development, Implementation, and Evaluation of a Resident Telemedicine Curriculum

Averi Wilson MD, Mozhu Li MD, Nicholas Lee MD, Jennifer B Walsh MD, & Rachel Bonnema MD

UT Southwestern Medical Center

Introduction

The COVID-19 pandemic prompted rapid development of telehealth-based care across the United States, and telemedicine has since become nearly ubiquitous in healthcare. To date, there has been little research on the development and implementation of telemedicine curricula for residents.

We sought to develop, implement, and evaluate a virtual telemedicine curriculum for over 180 Internal Medicine residents.

Methods

1. A virtual telemedicine curriculum was developed based on the 2021 ACP practice guidelines for telehealth.
2. The curriculum was delivered in the form of a pre-reading assignment and a single two-hour interactive didactic session.
3. Residents completed a survey evaluating confidence in conducting telehealth visits, preferences for telehealth, and a knowledge-based multiple-choice test before and after the curriculum.
4. Likert scale ratings and multiple-choice exam scores were compared before and after the curriculum.

Results

- 188 residents (100% of the program) participated in the curriculum and 74 (39%) residents completed both the pre and post surveys before and immediately after their single session
- Most residents reported they completed greater than 20 telehealth visits by phone in the year prior (62%), but only 0-5 video visits (72%)
- Surveys demonstrated an improvement in confidence rating for performing a physical exam via telehealth (1.9 (1.7-2.1) vs 3.3 (3.1-3.5), *P < 0.0001*)
- There was also a significant change in overall confidence for performing a telehealth encounter (3.8 [95% CI3.6-4.0] vs 4.0 [95% CI3.9 vs 4.2], P=0.0007), obtaining a history of present illness (4.2 [95% CI4.0-4.3] vs 4.3 [95% CI4.2-4.5], P=0.03), and developing an assessment and plan (3.7 [95% CI2.7-3.0] vs 4.0 [95% CI3.8-4.1], P=0.0004)
- Multiple-choice exam scores improved, with an average initial score of 53% and improvement to 68% *(P < 0.0001)*

Discussion

- We present a unique curriculum designed for a large group of residents who had limited experience with video visits during the pandemic and therefore an inability to "learn-by-doing"
- The change in overall resident confidence ratings was marginal and may not hold practical significance. More notable is the significant improvement in confidence performing a virtual physical exam and in resident knowledge as measured by multiple choice exam scores
- This study was limited by small sample size and low response rate
- In the future we hope to continue this curriculum and expand the experience by incorporating traditional direct observation and precepting as infrastructure develops

Our **single session** virtual **telemedicine curriculum** was **effective** for improving resident **confidence and knowledge** surrounding telehealth-based care.

Figures and Tables

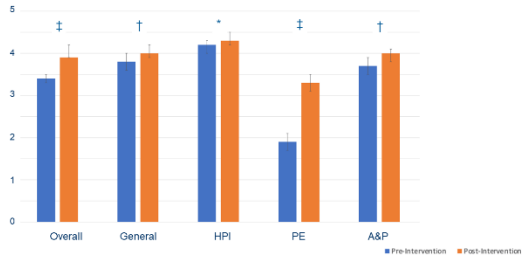


Figure 1. Pre- and post-intervention survey results by matched residents within the confidence measures. * indicates 0.01 < P < 0.05. † indicates 0.0001 < P < 0.01. ‡ indicates P < 0.0001.

HPI = history of present illness PE = physical examination A&P = assessment and plan

Table 1: Paired Survey Results. Pre- and post-intervention paired analyses for residents who completed both surveys. The paired t-test was utilized for these analyses. Perception measures included (1) preference for telehealth over in-person visits (with 1 indicating strong preference for in-person visits and 5 indicating strong preference for telehealth), (2) likelihood to perform research in telehealth, and (3) likelihood to use telemedicine in future practice. N = 74.

	Pre-Intervention Mean (95% CI)	Post-Intervention Mean (95% CI)	P
Confidence Measures	3.4 (3.3-3.5)	3.9 (3.8-4.0)	< 0.0001
General	3.8 (3.6-4.0)	4.0 (3.9-4.2)	0.0007
HPI	4.2 (4.0-4.3)	4.3 (4.2-4.5)	0.03
PE	1.9 (1.7-2.1)	3.3 (3.1-3.5)	< 0.0001
A&P	3.7 (3.5-3.9)	4.0 (3.8-4.1)	0.0004
Perception Measures	2.8 (2.7-3.0)	3.0 (2.8-3.1)	0.08
1	2.6 (2.4-2.9)	2.7 (2.5-3.0)	0.38
2	2.0 (1.8-2.3)	2.2 (2.0-2.5)	0.05
3	3.9 (3.6-4.1)	3.9 (3.6-4.1)	0.73
Multiple Choice Questions	53% (49-56%)	68% (64-72%)	< 0.0001

Acknowledgements

Thank you to Dr. Bonnema and Dr. Walsh for mentoring us in the development and evaluation of this curriculum. Thank you to the Internal Medicine Chief residents for the opportunity to develop and present the curriculum.

UT Southwestern Medical Center

Bradley Graves MD - Tracheostomy Outcomes in a Cohort of Children in a Primary Care Medical Home For Children in Foster Care

Primary mentor name	Loria, Hilda
Primary mentor's department / division	Pediatrics / Division of Developmental-Behavioral Pediatrics
Authors	Bradley Graves, Dept of Pediatrics, Hilda Loria: Department of Pediatrics, Division of Developmental-Behavioral Pediatrics
Scholarship category	Clinical
Study Purpose	To describe characteristics and outcomes of a cohort of children with a tracheostomy who are cared for in a primary care medical home for children in foster care.
Key findings:	We found that the average yearly hospitalization rate for children in foster care with tracheostomy was about 2.25 times per year. The average yearly office visits was 14.5. Surprisingly, our data showed that about 40% of these children were adopted.

UT Southwestern Medical Center

Tracheostomy Outcomes in a Cohort of Children in a Primary Care Medical Home For Children in Foster Care

Bradley Graves[1,2] and Hilda Loria[1,2]

[1]Pediatrics, Children's Medical Center, Dallas, TX; [2]Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

children's health

Background

- Children enter foster care often due to neglect, parental drug abuse, and physical abuse. However, less well studied are children who enter foster care due to medical complexity. The Department of Family and Protective Services defines medical neglect as "failure to seek, obtain, or administer medical treatment that could result in substantial harm." This is when a child enters a foster medical home.
- With the increase in medical advancements of the NICU and PICU, there is a projected increase in the number of these medically complex patients in the years to come. However, there will most likely be a deficit of foster caregivers to fulfill the role of the foster medical home, as caring for children with medical complexity may be overwhelming and challenging for caregivers.
- This study will explore various aspects of the yearly care required for patients in foster care who have a tracheostomy in order to provide data to better elucidate the care required of these patients for potential future foster medical homes.

Objectives

- To describe characteristics and outcomes of a cohort of children with a tracheostomy who are cared for in a primary care medical home for children in foster care.

Methods

- Study Design:
  - Retrospective chart review of an EMR of children in a primary care foster clinic at a large academic medical center in the US.
- Data collection:
  - Data were collected from the Electronic Medical Record (EPIC) and included patients 0 to 20 who had a tracheostomy status listed in an ICD-10 code or in their problem list. Additionally, each patient had completed at least one clinic visit while in the foster care system between January 1, 2017 and December 31, 2020.
- Patients were excluded if no information or insufficient yearly data were found for an encounter.

Results

- Overall, 15 patients had a tracheostomy status with at least one clinic visit at a primary care foster clinic between January 1, 2017 and December 31, 2020.
  - 4 male and 11 female
  - Average age was 7.4 years
- 14 patients were tracheostomy dependent prior to entering foster care, and 1 patient acquired a tracheostomy following placement in foster care.
- Average hospitalization per year: 2.25 (with a median of 2.25)
- Many children had multiple subspecialists involved in their care and the average number of office visits per year (including sick visits) was 14.5 with a median of 15.3.
- 40% were adopted between 2017 and 2020

Table 1: Patterns Among Children with Tracheostomy

		Tracheostomy Present (n = 15)
Number of Hospitalizations Per Year		
	mean	2.25
	median	2.25
Number of Office Visits Per Year		
	mean	14.5
	median	15.3
Number Decannulated		26.7% (n= 4)
Number Adopted		40% (n=6)
Number Reunified		13.3% (n=2)
Number of Tracheostomies Acquired		6.7% (n=1)
Mortality Rate		13.3% (n=2)

Discussion

- Children with a tracheostomy who are in foster care are medically complex and require numerous office visits and hospitalizations. The high number of office visits and hospitalizations may contribute to some foster caregivers feeling underprepared and overwhelmed.
- Despite this, many patients with a tracheostomy have been adopted from foster, and it is important to elucidate which factors contribute to successful rates of adoption and/or parent unification.
- Given that the majority of patients with a tracheostomy who enter foster care already have a tracheostomy in place, this data provides a preliminary framework to present foster caregivers who are undertaking the care of a child with a tracheostomy.

Future Steps

- Compare characteristics and outcomes of children with tracheostomy who are not in foster care.
- Identify factors related to placement stability and successful adoptions and/or reunifications, such as financial support for caregivers of children with complex medical needs, transportation support for frequent hospitalizations and office visits, and respite services.
- A quality improvement project focused on caregiver education for individuals or families interested in becoming a medical foster home may be beneficial to improve health outcomes for children with tracheostomies who enter foster care.

Jonathan Fletcher MD PhD - Secondary Histiocytic Sarcoma in Pediatric Leukemia

Authors	Jonathan S. Fletcher, Department of Pediatrics
Scholarship category	Clinical
Study Purpose	What clinical or demographic features should increase concern for secondary histiocytic sarcoma in the differential diagnosis of poorly explained osseous/multisystem illness in ALL patients? What potentially targets exist in the mutational landscape of these sarcomas?
Key findings:	Secondary histiocytic sarcoma has a strong male predominance in pediatric ALL, has a short latency period, and appears to often be clonally related to the primary lesion. CDKN2A and RAS/MAPK pathway mutations appear to be common and targeted inhibition of RAS/MAPK signaling may be of therapeutic utility.

Secondary Histiocytic Sarcoma in Pediatric Leukemia

Jonathan S. Fletcher MD, PhD
Pediatrics, UT Southwestern Medical Center; Children's Health, Dallas, TX

UT Southwestern Medical Center

children's health

Introduction

We encountered a young male pre-B acute lymphoblastic leukemia (ALL) patient in maintenance therapy, who presented with a painful hip lesion radiologically mimicking osteomyelitis who was subsequently found to have a disseminated secondary histiocytic malignancy consistent with histiocytic sarcoma (HS). Several rare histiocytic lesions of varying prognoses have been described following ALL. HS is associated with the poorest prognosis among these lesions. The rarity of secondary HS has precluded extensive characterization of these lesions and controlled therapeutics trials. Herein, we review published reports of secondary HS in the literature and the features thereof that might inform the diagnosis and management of this rare malignancy.

Table 1. Reported Cases of Pediatric Secondary Histiocytic Sarcoma

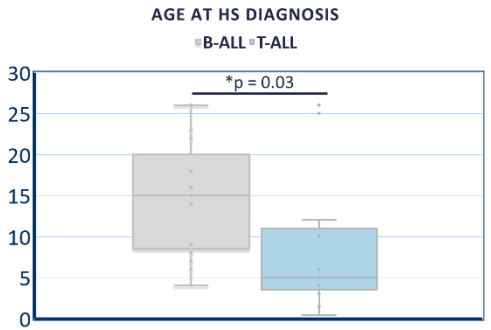
Age (years)	Sex	Primary	Interval to HS Diagnosis	Clonality	Shared Feature	CDKN2A/B Deletion	RAS/MAPK Mutation	Survival	Author	Year
6	M	T-ALL	30	ND	ND	Yes	Yes	No	Valera	2020
11	NR	Biphenotypic	ND	ND	ND	Yes	Yes	No	Bleeke	2019
0.4	M	T-ALL	13	Yes	MYC	Yes	Yes	ATOR	Ventakaraman	2020
5	F	Burkitt	22	Yes	t(8:14)	ND	ND	ATOR	d'Amore	2021
4	M	B-ALL	2	Yes	IGGR/TCR, CDKN2A	Yes	ND	No	Kumar	2010
6	M	T-ALL	15	Yes	TCR	Yes	ND	No	Alten	2015
10	M	T-ALL	12	Yes	TCR	ND	ND	No	Alten	2015
18	M	B-ALL	3	ND	ND	ND	ND	No	Pastor-Jane	2011
5	M	T-ALL	6	Yes	CDKN2A	Yes	ND	No	Castro	2010
15	M	B-ALL	3	ND	ND	ND	ND	No	Castro	2010
7	M	B-ALL	6	Yes	t(8:14)	ND	ND	ATOR	Castro	2010
3	M	T-ALL	16	ND	ND	ND	ND	No	Castro	2010
16	M	B-ALL	84	Yes	IGGR/TCR	ND	ND	ATOR	Brown	2019
16	M	B-ALL	0	ND	ND	ND	ND	No	Pani	2018
23	M	B-ALL	4	Yes	IGGR	ND	ND	ATOR	McClure	2010
6	M	B-ALL	21	ND	ND	ND	ND	No	Soslow	1996
8	M	B-ALL	12	ND	ND	ND	ND	No	Soslow	1996
4	M	T-ALL	12	ND	ND	ND	ND	No	Dalle	2003
14	M	B-ALL	21	ND	ND	ND	ND	No	Feldman	2004
22	F	B-ALL	16	ND	ND	ND	Yes	No	Thakral	2016
4	F	T-ALL	24	Yes	IGGR/TCR	No	No	No	Egan	2021
12	M	T-ALL	30	Yes	IGGR/TCR	Yes	Yes	No	Egan	2021
26	M	B-ALL	180	Yes	IGGR/TCR	No	Yes	No	Egan	2021
26	M	T-ALL	0	Yes	IGGR/TCR	Yes	No	No	Egan	2021
26	M	B-ALL	21	Yes	IGGR/TCR	Yes	No	No	Egan	2021
4	M	T-ALL	ND	ND	ND	Yes	Yes	No	Massoth	2021
25	M	T-ALL	ND	ND	ND	Yes	Yes	No	Massoth	2021
1.5	M	T-ALL	ND	Yes	MYC	Yes	Yes	No	Massoth	2021
14	M	B-ALL	ND	Yes	NRAS	No	Yes	No	Massoth	2021
9	M	B-ALL	5	Yes	CDKN2A	Yes	ND	No	Fletcher	2021

NR – Not reported, ND – Not Determined, IGGR – Immunoglobulin Receptor, TCR - T cell Receptor, ATOR – At time of report

Table 2. Summary Data

Age	11.6 ± 8.2 years
Sex	86% Male, 10% Female, 1 Not Known
Primary Malignancy	48% B-ALL, 45% T-ALL, 3% Burkitt's Lymphoma, 3% Biphenotypic B/Myeloid
Latency (Primary to Secondary)	Average: 23 months, Median: 14 months
Clonal Relationship to Primary	55% Confirmed (100% of tested samples)
CDKN2A/B Loss of Heterozygosity	41% Confirmed (80% of tested samples)
MAPK Pathway Mutation	34% Confirmed (80% of tested samples)
Survival at Time of Case Report	21% Alive at Time of Report

Figure 1. Age Distribution by Leukemia Type



Literature Review and Summary Statistics

A literature search for pediatric cases of histiocytic sarcoma secondary to pediatric ALL was performed in PubMed using the search criteria: pediatric histiocytic sarcoma, pediatric secondary histiocytic malignancy, pediatric ALL histiocytic malignancy identifying 29 additional cases meeting criteria of age < 30 years, primary pediatric leukemia diagnosis, secondary diagnosis of histiocytic sarcoma (Table 1). Notable features of reported cases include male predominance, short latency period between primary and secondary diagnosis, shared genetic features suggestive of clonal associated between primary and secondary malignancies where examined, and frequent mutations in CDKN2A and RAS/MAPK Pathway associated genes where examined. In most cases, multisystem disease was present at time of HS diagnosis. Cases in patients 20-30 years of age (n = 6, age 22-26), demonstrated similar characteristics to those in younger patients.

Summary

Histiocytic sarcoma is reported with similar frequency secondary to T-ALL and B-ALL in pediatric patients with a strong male predominance across leukemia subtypes. Presenting symptoms often occur within 1 to 2 years of primary diagnosis and multisystem involvement is typical. For unclear reasons, the majority of reported cases in T-ALL occur in patients <= 6 years of age with more even distribution across the age range in B-ALL. Homozygous loss of CDKN2A and pro-oncogenic RAS/MAPK pathway mutations appear to be a common feature in HS where characterized, although the extent to which these lesions reflect acquired secondary mutations versus shared features with the primary malignancy is poorly characterized. Notably, BRAFV600E mutations, frequent in Langerhans Cell Histiocytosis, appear less common than N/K/H RAS in HS, but the frequency of RAS/MAPK pathway mutations suggest that targeted inhibition could have clinic utility in these poorly treatable lesions. HS should be considered in the differential diagnosis of osseous or multisystem illness of unclear etiology not consistent with relapse in young male ALL patients.

Lydia Sandy MD - Leveraging the TriNetX database to explore the association between obesity and dyspnea in pediatric patients

Primary mentor name	Babb, Tony
Primary mentor's department / division	Internal Medicine / Pulmonary and Critical Care Medicine
Authors	Lydia Sandy, MD, Department of Pediatrics, University of Texas Southwestern Medical Center; Jorge Granados, PhD, Department of Internal Medicine, University of Texas Southwestern Medical Center; Ayesha Zia, MD, Department of Pediatrics, Division of Hematology and Oncology, University of Texas Southwestern Medical Center; James Pawelczyk, PhD, Department of Kinesology, Penn State University; Tony Babb, PhD, Department of Internal Medicine, Division of Pulmonary and Critical Care Medicine, University of Texas Southwestern Medical Center
Scholarship category	Clinical
Study Purpose	Obesity is a known risk factor for dyspnea in adults. The aim of this study is to determine if overweight and obese prepubescent patients without significant respiratory and cardiac diseases will be more likely to have dyspnea than their normal weight peers.
Key findings:	-Being overweight or obese significantly increases the risk for dyspnea in prepubescent children without comorbidities that could cause dyspnea. -Within the UTSW database, overweight and obese females were more likely to have a diagnosis of dyspnea than males. However, within the global database, the risk ratio for females and males was much closer. -The prevalence of children with a BMI documented as >85th percentile or with the ICD-10-CM code for "overweight and obesity" is much lower than the NIH reported prevalence of 41.5%.1 This difference could be due to inaccurate and incomplete coding in the electronic medical record. -For database research to be more effective, physicians should list all appropriate ICD-10-CM codes for their patients. -Frequently updated databases based on electronic medical records are a valuable tool to examine the associations between diseases. Utilization of these databases may be particularly helpful to determine the feasibility and importance of future studies.

Leveraging the TriNetX database to explore the association between obesity and dyspnea in pediatric patients

Lydia Sandy, MD,[1,2] Jorge Granados, PhD,[2,3] Ayesha Zia, MD,[1,2] James Pawelczyk, PhD,[4] Tony Babb, PhD[2,3]

[1]Children's Medical Center, Dallas, TX ; [2]University of Texas Southwestern Medical Center, Dallas, TX, [3]The Institute for Exercise and Environmental Medicine, Dallas, TX; [4]Penn State University

Background

- The obesity epidemic remains a significant and growing problem among children in north Texas and globally. The National Institutes of Health (NIH) reports the prevalence of overweight and obesity in children in the United States to be 41.5%. [1]
- Dyspnea is an uncomfortable symptom that may cause patients to prematurely end their exercise or prevent them from exercising at all, thus encouraging a more sedentary lifestyle.[2]
- In adults, obesity is a known risk factor for dyspnea.[3] Previous research has shown that increased body mass index (BMI) in early childhood is associated with an increased risk of dyspnea as children age.[4] However, this study did not exclude patients with comorbidities that could cause dyspnea, such as asthma.
- TriNetX is a federated research network which includes 59 healthcare organizations around the world, including the University of Texas Southwestern (UTSW). This database provides access to de-identified patient data in real time by retrieving information from the electronic health records of participating healthcare organizations.

Hypothesis

Overweight and obese prepubescent patients without significant respiratory and cardiac diseases will be more likely to have dyspnea than their normal weight peers.

Objectives

- Utilize a large database, TriNetX, to investigate the relationships between overweight and obesity among prepubescent pediatric patients both locally at UTSW and globally.
- Determine the prevalence of overweight and obese patients in the UTSW and global TriNetX databases.

Methods

Analysis of a federated multicenter research network, TriNetX, was performed using data from both the UTSW and global databases. Patients 8 to 12 years of age with ICD-10-CM E66 for "overweight and obesity" or "BMI > 85th percentile" were compared to a normal weight cohort to examine their association with ICD-10-CM R06.0 for "dyspnea." Patients diagnosed with comorbidities that could cause dyspnea were excluded. The prevalence of patients with ICD-10-CM E66 ("overweight and obesity") or "BMI > 85th percentile" is reported. Risk ratios and chi squared tests (two-sided) were performed using 2x2 contingency tables.

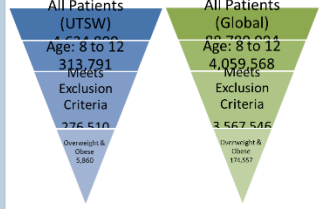


Figure 1: Patient selection from the UTSW and Global TriNetX databases was based on age and exclusion and inclusion criteria.

Exclusion Criteria:

- Asthma (ICD-10-CM J45)
- Bronchopulmonary dysplasia originating in the perinatal period (ICD-10-CM P27.1)
- Complications and ill-defined descriptions of heart disease (ICD-10-CM I51)
- Cystic fibrosis (ICD-10-CM E84)
- Heart failure (ICD-10-CM I50)
- Muscular dystrophy (ICD-10-CM G71.0)
- Other chronic obstructive pulmonary disease (ICD-10-CM J44)
- Other disorders of lung (ICD-10-CM J98.4)
- Other interstitial pulmonary diseases (ICD-10-CM J84)
- Other specified congenital malformations of respiratory system (ICD-10-CM Q34.8)
- Pulmonary embolism (ICD-10-CM I26)
- Sleep apnea (ICD-10-CM G47.3)
- Vaping-related disorder (ICD-10-CM U07.0)

Results

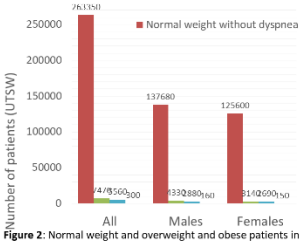


Figure 2: Normal weight and overweight and obese patients in the UTSW TriNetX database were categorized based on a diagnosis of dyspnea and gender.

	Total	Male	Female
UTSW			
Risk Ratio	1.86	1.73	2.17
Confidence Interval	1.66 - 2.08	1.48 - 2.01	1.85 - 2.54
P-value	<0.001	<0.001	<0.001
Global			
Risk Ratio	2.14	2.13	2.15
Confidence Interval	2.10 - 2.19	2.07 - 2.18	2.09 - 2.21
P-value	<0.001	<0.001	<0.001

Figure 3: Risk ratios for the association between overweight and obesity and dyspnea were calculated for patients in both UTSW and Global TriNetX databases.

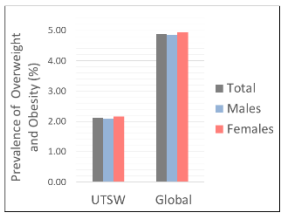


Figure 4: The prevalence of overweight and obesity was calculated for all patients and for each gender in both UTSW and Global TriNetX databases.

Conclusions

- Being overweight or obese significantly increases the risk for dyspnea in prepubescent children without comorbidities that could cause dyspnea.
- Within the UTSW database, overweight and obese females were more likely to have a diagnosis of dyspnea than males. However, within the global database, the risk ratio for females and males was much closer.
- The prevalence of children with a BMI documented as >85th percentile or with the ICD-10-CM code for "overweight and obesity" is much lower than the NIH reported prevalence of 41.5%.[1] This difference could be due to inaccurate and incomplete coding in the electronic medical record.
- For database research to be more effective, physicians should list all appropriate ICD-10-CM codes for their patients.
- Frequently updated databases based on electronic medical records are a valuable tool to examine the associations between diseases. Utilization of these databases may be particularly helpful to determine the feasibility and importance of future studies.

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Acknowledgements

Support was provided by the University of Texas Southwestern Medical Center – Stimulating Access to Research in Residency R38 training grant, R38HL150214, awarded by the National Heart, Lung, and Blood Institute (PI: Susan Hedayati).

Alyna Garza MD - Utility of Infographics for presenting AAP recommendations to pediatric resident

Primary mentor name	Berry, Deaina
Primary mentor's department / division	Pediatrics
Authors	Alyna Y. Garza, MD, Deaina Berry MD, FAAP
Scholarship category	Education
Study Purpose	The aim of this study is to assess the acceptability and utility of infographics as a format for presenting current AAP recommendation to pediatric residents
Key findings:	This study highlights the utility of infographics for summarizing medical literature and AAP recommendations Pediatric residents preferred infographics over other modalities (video / audio (podcast), text-only abstracts / journal articles) Infographics are perceived to be less mentally taxing to review and have the potential to impact clinical practice

Utility of Infographics for presenting AAP recommendations to pediatric resident

Alyna Y. Garza, MD[1]
Deaina Berry MD, FAAP[1,2]

[1]UT Southwestern Medical Center and Children's Medical Center, Dallas TX
[2]Parkland Health Redbird Health Center, Dallas TX

Introduction

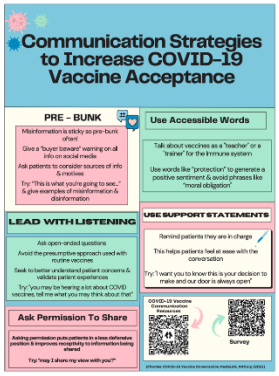
- To provide evidence-based care, medical providers must stay up to date with medical literate and relevant recommendations
- Traditional methods pose numerous barriers to reviewing the medical literature
- Infographics are visualizations of data and ideas that can be efficiently and effectively consumed and understood
- Previous studies have suggested infographics could play a key role in summarizing medical literature and are associated with higher reader preference
- There is opportunity to increase pediatric resident exposure to medical literature and AAP recommendations through the utilization of infographics

Aim

- The aim of this study is to assess the acceptability and utility of infographics as a format for presenting current AAP recommendation to pediatric residents

Methods

- This study focuses on UTSW Pediatric residents across all training levels
- Given the prevalence of COVID-19 Vaccine hesitancy, a topic of increasing COVID-19 vaccine uptake was chosen
- An infographic with AAP recommendations on Effective COVID-19 Vaccine Conversations was distributed
- Familiarity with the recommendations, potential impact on practice, and cognitive load required to review the infographic were evaluated with pre- and post- surveys



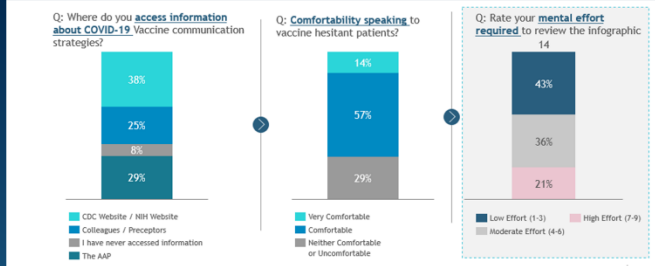
Infographics are preferred over other modalities.

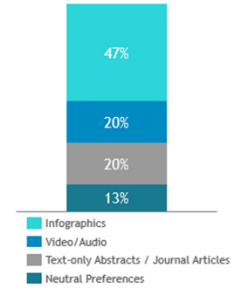
Infographics require a **low mental effort**.

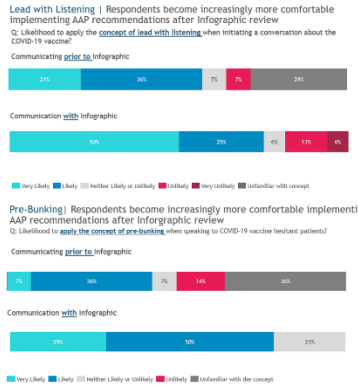
Infographics can have a **meaningful impact** on clinical practice

children's health Children's Medical Center | UTSouthwestern Medical Center

Results







Discussion

- This study highlights the utility of infographics for summarizing medical literature and AAP recommendations
- Pediatric residents preferred infographics over other modalities (video / audio (podcast), text-only abstracts / journal articles)
- Infographics are perceived to be less mentally taxing to review and have the potential to impact clinical practice

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Amisha Patel MD - Team KiPOW (Kid Power) Texas

Primary mentor name	Kelly, Nancy
Primary mentor's department / division	General Pediatrics
Authors	Amisha Patel, Department of Pediatrics; Chelsea Burroughs, Department of Pediatrics; Ryan Kwong, Department of Pediatrics; Mariam Nasir, Department of Pediatrics; Nancy Kelly, Department of Pediatrics
Scholarship category	Education
Study Purpose	To implement a virtual nutrition curriculum for 2nd grade students at high risk for food insecurity and obesity and to assess the effectiveness of the curriculum in increasing students' knowledge about nutritional literacy.
Key findings:	Students demonstrated increased nutritional literacy after receiving a virtual curriculum regarding nutrition and this was statistically significant.

Team KiPOW (Kid Power) Texas

Amisha Patel, MD, Chelsea Burroughs, MD, Ryan Kwong MD, Mariam Nasir, MD, Nancy Kelly, MD, MPH

Pediatrics, Children's Medical Center, Dallas, TX; Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

Background

- Obesity and food insecurity commonly co-occur and food insecurity disproportionately impacts low-income households and racial/ethnic minority groups. [1,2]
- Approximately 40% of children, grades 3-12, in Dallas County public and charter schools are overweight or obese. [3]
- 87% of students at John J. Pershing Elementary School qualify as low socioeconomic status (annual income at or below the poverty line) and the school's minority enrollment is 98%. [3]
- The COVID-19 pandemic has worsened food insecurity in the United States with a disproportionate affect to low-income families.[1]
- Team Kid POWER (known at KiPOW) was started in Washington, D.C., is a school-based health collaborative which used health mentors to teach and model healthy eating and exercise. [4]
- In 2018, with the help of an AAP CATCH grant and KiPOW D.C., the KiPOW Texas chapter was established as a partnership between UTSW residents and John J. Pershing Elementary school. Every school year since then, we have created a resident led program which aims to promote nutritional literacy, fitness, and other healthy lifestyle changes.
- Due to COVID-19, the curriculum has been modified for virtual presentation. For the 2021-2022 school year, all students were present at school in-person and curriculum was presented virtually.

Objectives

- To implement a virtual nutrition curriculum for 2nd grade students at high risk for food insecurity and obesity
- To assess the effectiveness of the curriculum in increasing students' knowledge about nutritional literacy

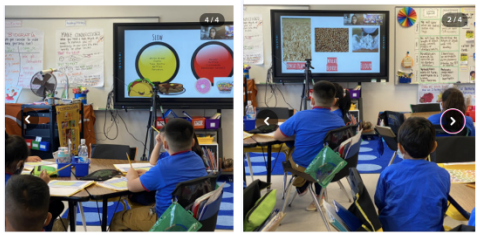
Description of Study

Intervention

- Approval was obtained from UTSW IRB and Dallas Independent School district to do this study.
- All students were invited to receive the education but only those students who were consented were included in the study.
- We used previously created PowerPoint presentations containing the a nutrition curriculum and provided hard copies of hands-on activity worksheets and tests to 2 second-grade classes. Presentations were delivered virtually via Zoom.
- A group of 4-6 pediatric residents presented 5 health topics between Nov 2021 and March 2022: (1) My Plate & Energy, (2) Fruits and Veggies, (3) Whole Grains & Carbohydrates, (4) Proteins & Healthy Fats, and (5) Dairy & Vitamins. Due to difficulty with teaching nutrition labels virtually, this topic was temporarily removed from the curriculum this year.
- We developed a 15-question knowledge test that corresponded with health topics covered in each session. The test included a combination of T/F questions, multiple-choice, and matching.
- The test was written in English, but teachers provided oral translation into Spanish during test sessions.
- The test questions were administered at two points during the study: (1) **pre-test** prior to any intervention in November 2021, (2) **post-test** at the end of the study in March 2022.

Data Collection and Analysis

- Consent was obtained from parents of 34/38 students (89%). A total of 27 students completed both pre-test and post-test and these tests were used for data analysis.
- Mean number of correct answers were calculated and paired t-test was used to determine significance of intervention with level of significance set at 0.05.



Students wearing KiPOW T-shirts (provided by program) learning about grains.

Results

Table 1: Mean total number correct (out of 15)

	Pre-Test	Post-Test
Mean total number correct (SD)	6.48 (2.05)	9.26 (2.09)

Examples of Test Questions.

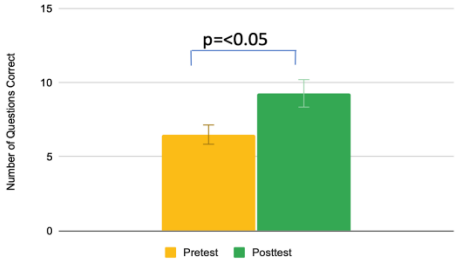
1. Each healthy plate of food has 5 important groups - can you name them?

3. Match each of these words:

GO	Takis
SLOW	Apple
WHOA	Tacos

1. What of the following is an example of a "GO" grain?
   a. Whole grain tortilla
   b. Doughnut
   c. Cinnamon toast crunch

Figure 2: Mean Total Correct Answers Before and After Curriculum (N=27)



Conclusions

- Students demonstrated increased nutritional literacy after receiving a virtual curriculum regarding nutrition and this was statistically significant.

Challenges & Future Directions

- Virtual format limited our ability to interact with the students and carry out previously created hands-on activities. Being able to join students at school for lesson, lunch and recess would likely improve the effectiveness of our curriculum.
- Many students preferred Spanish for reading/writing. In the future, creating quizzes in both English and Spanish may improve understanding of questions.
- In the future, we could add an additional subject such as social-emotional learning or dental health into the curriculum.

Acknowledgements

- John J Pershing Elementary and DISD with special recognition to our two teachers Mrs. Escobar-Garza and Mr. Quezada
- AAP for the gracious CATCH grant which allowed funding of our project
- Texas Pediatric Society which acted as our fiscal agent
- Team KiPow (Kid Power) national
- UTSW residents who voluntarily participated
- The second grade students at John J Pershing Elementary for their enthusiastic participation

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Cristina Saez MD - Culturally Sensitive Care for Latino Immigrant Populations: An Introductory Curriculum for Pediatric Residents

Primary mentor name	**Loria, Hilda**
Primary mentor's department / division	Pediatrics/ Developmental-Behavioral Pediatrics
Authors	Cristina Saez, Department of Pediatrics; Hilda Loria, Department of Pediatrics, Division of Developmental-Behavioral Pediatrics
Scholarship category	Education
Study Purpose	To increase pediatric residents' perceived knowledge and skills in providing culturally sensitive care to Latino immigrant patients and families in a clinical setting.
Key findings:	- On a scale of 1-10, residents rated importance of cultural sensitivity education in residency on average of 8.75. - On a scale of 1-10, residents rated knowledge of Latino health beliefs at an average of 5.16. - Time and lack of opportunity are learning barriers that can be addressed by intentional targeted education. -A one-time didactic session can have positive impact on pediatric residents' perceived knowledge and skills in cultural sensitivity for a Latino immigrant population.

Culturally Sensitive Care for Latino Immigrant Populations: An Introductory Curriculum for Pediatric Residents

Cristina Saez, MD and Hilda Loria, MD

University of Texas Southwestern Medical Center and Children's Health, Dallas, TX

BACKGROUND

Children's Medical Center Dallas serves a large metropolitan area whose population consists of 18% Latinos, 1/3 of which are immigrants[1,2]. Serving this population well involves several unique cultural challenges such as a possible language barrier, immigration status, and interests in alternative medicine. In 2004 the ACGME began to require medical trainees to undergo some form of cultural sensitivity training in medical school and/or residency to address the growing needs of a diverse American population. Currently, there is limited data on standard curriculum for residents.

OBJECTIVE

To increase pediatric residents' perceived knowledge and skills in providing culturally sensitive care to Latino immigrant patients and families in a clinical

METHODS

- Anonymous needs assessment survey administered to all 116 residents within UTSW Pediatrics Residency program
- Survey results used to develop 4-hr long educational curriculum session for 29 residents ranging from PGY-1 to PGY-4.
- Presenters included: PGY-2 pediatrics resident, junior faculty member in Department of Pediatrics, and 2 certified medical interpreters from Language Access Services Center at Children's Health Dallas
- Topics presented included: overview of cultural sensitivity, working with interpreters, Latino folk illnesses and common health beliefs, and unique needs of an immigrant population
- Residents' perceived knowledge and skills were assessed via anonymous pre- and post-session surveys.
- Data from these surveys was analyzed using descriptive statistics and a paired t-test statistical analysis

RESULTS

Figure 1. Selected Results from Needs Assessment Survey

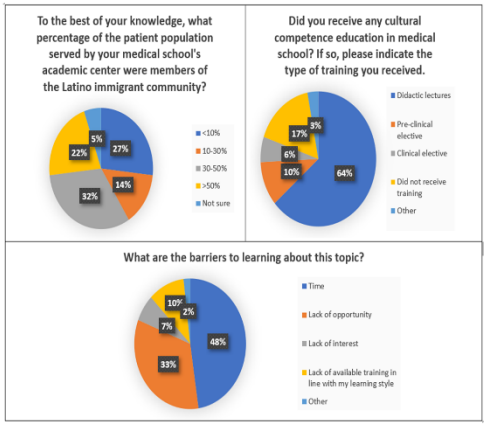
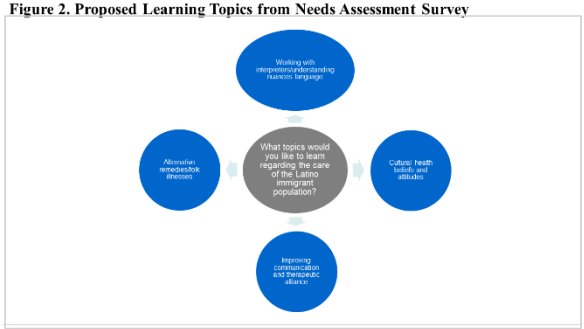


Table 1. Comparison of Pre- and Post-Session Survey Results

Item	Pre-Test Average	Post-Test Average	P-value
Identify ways in which a lack of cultural competency could impact patient care.	3.8	4.5	< 0.001
Name cultural values that may influence how Latino patients interact with medical providers.	3.2	4.4	< 0.001
Name at least 2 different herbal or spiritual remedies that are commonly used in different Latino populations.	2.1	4.8	< 0.001
Describe how to optimally utilize an interpreter in a patient encounter.	4	4.8	< 0.001
Describe how to optimally utilize an interpreter in a patient encounter.	4	4.8	< 0.001
Describe how a family's belief in the Catholic faith can be integrated into the patient encounter.	2.9	4.4	< 0.001
Describe how a family's belief in the Catholic faith can be integrated into the patient encounter.	2.8	4.4	< 0.001
Identify unique challenges with possible solutions when caring for an immigrant population.	3.2	4.4	< 0.001

Figure 2. Proposed Learning Topics from Needs Assessment Survey



Needs Assessment Survey

- 49% of residents (n=57) responded to needs assessment survey.
- On a scale of 1-10, residents rated importance of cultural sensitivity education in residency on average of 8.75.
- On a scale of 1-10, residents rated knowledge of Latino health beliefs at an average of 5.16.

Session Objectives

At the end of the educational session, residents will gain knowledge and skills to provide culturally competent care to Latino immigrant patients and families in the clinical setting.

Residents will be able to:

1. Describe common Latino folk illnesses, cultural health beliefs, and attitudes towards medical care.
2. Integrate cultural health beliefs and alternative remedies into the treatment plan of Latino immigrant patients.
3. Discuss strategies to improve communication with Latino immigrant patients and strengthen the therapeutic alliance.
4. List steps to optimize working with an interpreter during a patient encounter.

CONCLUSIONS

- There is a need for more dedicated education on cultural sensitivity education in residency, especially at programs that serve a diverse population.
- Time and lack of opportunity are learning barriers that can be addressed by intentional targeted education.
- A one-time didactic session can have positive impact on pediatric residents' perceived knowledge and skills in cultural sensitivity for a Latino immigrant population.

FUTURE DIRECTIONS

- Continuation and expansion of this curriculum could reach a broader audience.
- Success of curriculum could be measured via objective metrics or patient-focused outcomes.
- A similar process could be carried out with other minority populations.

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ACKNOWLEDGEMENTS

The authors would like to acknowledge the administrative leadership of the UT Southwestern Pediatrics Residency Program for their participation in the implementation of this project.

Ealing Mondragon MD - Comparing Efficacy of Self-Guided vs. Synchronous First-Time Seizure Education for Residents

Primary mentor name	Armstrong, Dallas
Primary mentor's department / division	Child Neurology
Authors	Ealing Mondragon, MD, Dept of Pediatrics; Aaron Pope, MD, Dept of Neurology; Dallas Armstrong, MD, Dept of Neurology
Scholarship category	Education
Study Purpose	Compared to a self-guided online module, is a synchronous interactive education format more effective at increasing knowledge regarding first-time seizures and comfort in discussing the diagnosis with families among residents?
Key findings:	1. Improvement in knowledge and comfort ratings in both delivery formats; 2. Overall, statistically significant increase in comfort improvement in online learners compared to noon conference attendees (Mann-Whitney U p = 0.042) Improvement in knowledge did not show statistically significant difference (Mann-Whitney U p = 0.527). 3. Findings and statistical significance limited by low response rate and difficulty in administering the two interventions simultaneously.

Comparing Efficacy of Self-Guided vs. Synchronous First-Time Seizure Education for Residents

Ealing Mondragon, MD[1] Aaron Pope, MD[2] Dallas Armstrong, MD[2]

[1]Pediatrics, Children's Medical Center, Dallas, TX; [2]Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

Introduction

- Initial presentations of seizure-like activity in children are accompanied by high caregiver anxiety and need for anticipatory guidance.
- Per needs assessment conducted AY 2020-2021, residents would benefit from formal education to increase practical clinical and communication skills for such situations.
- Interactive learning in group settings has been shown to be more effective than self-guided online learning for education anecdotally and in research.[1]
- Effective adult learning requires giving and application of feedback. Additionally, learning exercises should provide opportunity for reflection and discussion, rather than merely serve to fulfill a requirement.[2]

Goals/Objectives

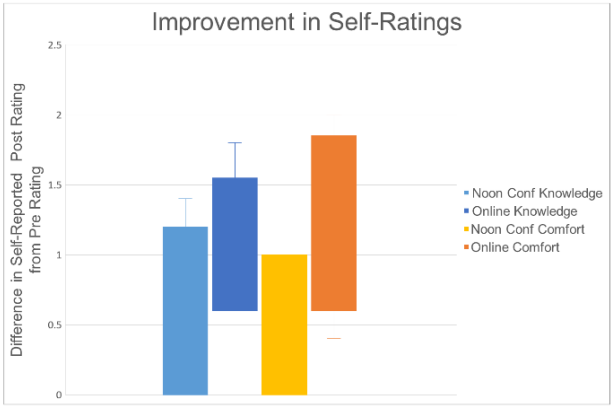
- Improve resident confidence in discussing first-time seizure education topics
- Discuss general communication strategies that can be applicable in other clinical presentations besides seizures in facing uncertain diagnosis and/or prognosis, particularly in ED/acute care settings
- Improve resident knowledge regarding first-time seizure education topics
- Prepare residents to respond professionally and accurately to common concerns and questions from families
- Compare efficacy of interactive didactic session versus self-guided online module

Methods

- Distributed online module (based on needs assessment completed AY 2020-2021) to new intern class Jul 2021
- Four months later, presented interactive didactic session available to pediatrics residents at all PGY levels
- Residents in each intervention cohort took pre-and post-intervention self-assessments of knowledge of first-time seizures as well as comfort in discussion of the diagnosis.
- Responses were distinguished by respondent cell phone number rather than resident name
- Outcomes were self-reported changes in knowledge and confidence.

Results

- Online Course completed by four interns
- Improvement in knowledge self-ratings (Wilcoxon p = 0.066)
  - Improvement in comfort self-ratings (Wilcoxon p = 0.066)
- Seven separate respondents from all class years in noon conference
  - Improvement in knowledge self-ratings (Wilcoxon p = 0.043)
  - Improvement in comfort self-ratings (Wilcoxon p = 0.039)
- No statistically significant difference in pre-intervention self-ratings between groups
  - Pre-Assessment Knowledge (Mann-Whitney U p = 0.315)
  - Pre-Assessment Comfort (Mann-Whitney U p = 0.073)
- Overall, statistically significant increase in comfort improvement in online learners compared to noon conference attendees (Mann-Whitney U p = 0.042)
- Improvement in knowledge did not show statistically significant difference (Mann-Whitney U p = 0.527)



Conclusions

- Both methods of learning produced significant improvements in trainee knowledge regarding first-time seizures and comfort in discussing these events with families.
- For knowledge-based learning, online learning may be an attractive and equivalent delivery method that allows flexibility and self-paced learning as well as optimal stewardship of synchronous/in-person learning time.
- Comfort in discussing first-time seizures may improve spontaneously during residency training due to clinical experience

Limitations

- Low response rate
- Difficulty in simultaneous implementation of two separate learning methods
- Uncertainty in planning in-person sessions due to ongoing COVID-19 pandemic fluctuations
- Delivery of live interactive session both in-person and virtually
- Time constraints of noon conference

Future Direction

- Integration of breakout sessions within larger interactive didactic groups
- Integration of online learning where appropriate to supplement synchronous learning
- Ways to increase learner participation and engagement, reduce "survey fatigue"

References

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Annette Ville, MD, Kelly Parsons, MD, Katie Dolak, MD - Medical Student to Pediatrician: A Focus on Telemedicine and Primary Care

Primary mentor name	**Agharokh, Ladan**
Primary mentor's department / division	Pediatrics / Hospitalist Medicine (medical education)
Authors	Annette Ville, Dept of Pediatrics; Kelly Parsons, Dept of Pediatrics; Katie Dolak, Dept of Pediatrics; Bella O'Malley, Dept of Pediatrics; Courtney Johnson, UT Southwestern Medical Center; Ladan Agharok: Dept of Pediatrics, Division of Hospitalist Medicine
Scholarship category	Education
Study Purpose	The aim of this project was to create and implement a medical student course teaching telemedicine and primary care skills through asynchronous learning, simulation, and real-time feedback.
Key findings:	Students who participated in our course gained confidence in confidentiality, use of technology, approaching adolescent medicine encounters, educating patients, and counseling patients within telemedicine and primary care encounters

Medical Student to Pediatrician: A Focus on Telemedicine and Primary Care

Annette Ville, MD, Kelly Parsons, MD, Katie Dolak, MD, Bella O'Malley, MD, Courtney Johnson, Ladan Agharokh, MD

Pediatrics, Children's Medical Center, Dallas, TX; Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

Background

The COVID-19 pandemic has been a time of adaptation in many fields. The medical field has been faced with the challenge of continuing to provide care for all patients while aiding in halting the spread of COVID-19. One way that we have done this is by utilizing telemedicine. Given this abrupt increase in the use of virtual medical platforms, medical students around the nation have needed to quickly become proficient in this area. Our team set out to better prepare the UT Southwestern medical students to use telemedicine in the primary care setting.

We have developed a curriculum implemented in UT Southwestern's Residency Essentials for future pediatricians. Students learned to conduct a pediatric primary care visit through a telemedicine platform and worked on skills to appropriately complete a HEADSS exam virtually. We used asynchronous learning via online forums, as well as group simulations with real time feedback. We then used student surveys to improve the course and gauge perceived improvement in competencies.

Objectives

1. Implement a curriculum addressing competencies in telemedicine and primary care for the transition to residency course for future pediatricians
2. Gain the essential skills needed to practice telemedicine
3. Be able to confidently complete a pediatric primary care visit through a virtual platform
4. Enhance ability to perform HEADSS exam virtually

Curriculum Overview

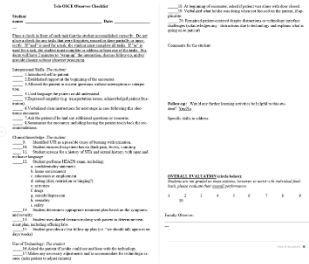
Facilitator and student directed forum learning the week leading up to simulation → Group simulation with facilitator and mentor → Facilitator and standardized patient-led but student-run feedback session immediately following simulation

Curriculum Details

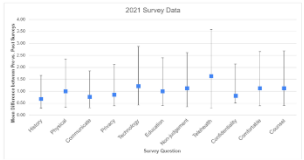
- 2021 and 2022 Residency Essentials delivered in a virtual format - optimal for learning and practicing telemedicine clinical skills
- Asynchronous learning through online forum where resources related to telemedicine and primary care were shared by both facilitators and students
- Group simulation of a primary care visit using a virtual platform
- Facilitator and standardized patient on the virtual visit – each trained in how to optimize learning for students in the setting
- Visit completed in a popcorn style simulation, allowing them to build off each other and learn from each other
- Facilitator-run, but student-led, feedback session – students discussed what went well, what they learned, and what they could improve on
- 2022 session added a follow-up scenario: disclosing sensitive test results to patients

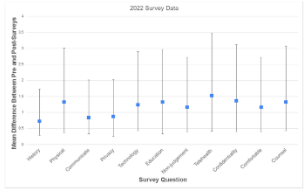
Future Directions

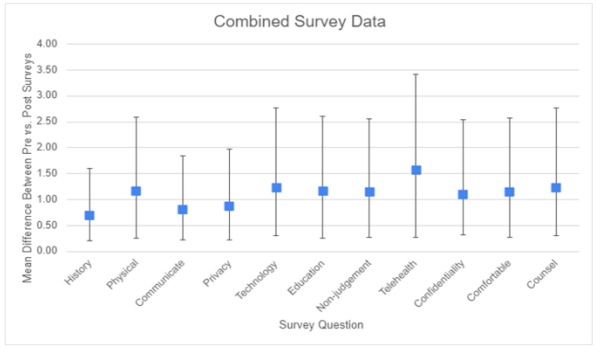
- Implement checklist to evaluate students
- Use modified Delphi approach to validate checklist
- Add multiple simulations to allow feedback in between simulation attempts



Results







Summary

In a day and age when telemedicine is becoming necessary and widespread, medical students require training in this field. We used UT Southwestern's Pediatric Residency Essentials course to implement a telemedicine in primary care curriculum. We prepared students to work in an environment where telemedicine competency is now a necessary skill.

Students gained confidence in several aspects of clinical skills including effective communication, prioritizing privacy, and providing confidential, non-judgmental counseling while practicing in a telemedicine context.

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Shivani Misra MD MPH - Development of a Trauma-Informed Parent Education Session

Primary mentor name	**Loria, Hilda**
Primary mentor's department / division	Pediatrics/ Rees Jones Center for Foster Care Excellence
Authors	Shivani Misra, MD, MPH Dept of Pediatrics, Rees Jones Center for Foster Care Excellence; Hilda Loria, MD, Dept of Pediatrics, Rees Jones Center for Foster Care Excellence; Erinne Connor, MSW, Rees Jones Center for Foster Care Excellence
Scholarship category	Education
Study Purpose	The aim is to develop a training session for parents of our foster care clinic to address an expressed need of strategies to combat picky eating.
Key findings:	The presentation was successfully created and presented on May 11, 2022. The platform provided a space for questions and multiple salient themes were amassed from the questions asked afterwards and the post-attendance survey. These themes can be utilized to further enhance the training session.

Development of a Trauma-Informed Parent Education Session

UT Southwestern Medical Center

Shivani Misra, MD,MPH; Hilda Loria, MD; Erinne Conner, MSW

Rees Jones Foster Care Clinic

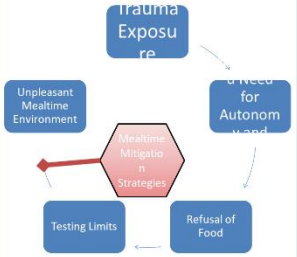
children's health

Introduction

Etiology: Studies show that anywhere from 1:10 to 1:3 children are classified as picky eaters.

Why it Happens: Controlling food has been shown one of the first signs of bodily autonomy a child possesses. With examples as early a s 7-9 months of age, it is considered developmentally appropriate for children this young to express autonomy by pushing their bottles away (even if they're hungry).

Figure 1: Breaking the Cycle



Why this population: When overlaying this developmental milestone atop a population that is the victim of trauma, control becomes a focal point in their development. Thus, in the foster care system, one can image the rates of picky eating complaints is even higher than the general population.

Where this took place: Rees Jones Center for Foster Care Excellence (RJC), multi-disciplinary program that has services from child and adolescent psychiatry, psychology, child protective services, and pediatrics so that children in foster care may have one place to come for their care.

Figure 2: The Presentation

Why this training: Foster parents are required to attend a certain number of trainings per year to maintain certifications. RJC has created multiple sessions to educate parents to meet this need. Previous surveys have indicated that parents are specifically asking for strategies they can implement, hence the creation of this presentation.

The Product: The session was hosted on May 11, 2022. Registration was open to all, and it was advertised on the clinic website as well as shared on social media. There were 30 viewers in attendance. The presentation was 30 minutes long with 30 minutes for questions and answers. Afterwards, participants were asked to complete a follow up survey.

Learning Objectives

- Define picky eating
- Understand why it happens more often in this population specifically
- Medical complications it can lead to
- Health concerns it can be masking
- Strategies to combat this problem
  - Functional analysis
  - Positive reinforcement
  - Repeated exposure
  - "Try a bite" strategy
  - Providing information
  - Combining foods
  - Mealtime atmosphere/ social cues

Figure 3: Sample Strategy

As listed previously, 7 strategies were offered to families to assist with mealtimes. This slide represents one strategy involving mitigation of the mealtime atmosphere with calm environments and a suggestion on how to make meals more fun. It also encourages peer examples as a healthy model for the picky eater.

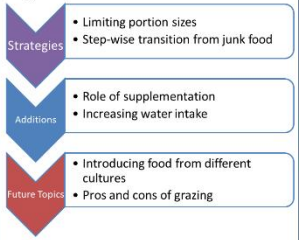
Figure 4: General Themes Post Presentation

One benefit of the modality used for this presentation was the easy transition to discussion after the presentation. Multiple participants had specific questions based off their personal experiences. There were common themes identified amongst these questions, represented in Figure 3.

Conclusions

Overall, the creation of this presentation was a successful attempt at providing families with a requested resource. Fussy eating is a common problem that plagues toddlers and their families everywhere. It can be especially problematic in children who have faced traumas.

Figure 5: Future Directions



Acknowledgements

Big thank you to Dr. Hilda Loria and Dr. Kimberly Stone for showing me what it means to be a good general pediatrician, and Erinne Conner, MSW for all her support.

Resources

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Rebecca Duron MD MSPH - Implementation of Screening for Adverse Childhood Experiences in Med-Peds Clinic

Primary mentor name	Broker, Paul
Primary mentor's department / division	Internal Medicine and Pediatrics
Authors	Rebecca Duron, Anjali Vora, Alexis Boulter, Paul Broker; Division of Combined Internal Medicine and Pediatrics
Scholarship category	Quality / Process Improvement
Study Purpose	Adverse Childhood Experiences (ACEs) can lead to increased risk for health and developmental problems. We sought to incorporate ACEs screening into routine pediatric visits at a resident continuity clinic.
Key findings:	Approximately 50% of 9-month well child checks included a completed ACEs screener from March 2021 to March 2022. Utilizing current screening framework for new topics is an easy and effective method but requires monitoring to ensure persistence. Most patients screened in our clinic did not report significant ACEs. Maintaining an up to date and useful collection of community resources is challenging. The health system informatics team can create supportive tools within Epic.

Implementation of Screening for **Adverse Childhood Experiences** in Med-Peds Clinic

Rebecca Duron, MD, MSPH, Anjali Vora, MD, MPH, Alexis Boulter, MD, Paul Broker, MD

William T. & Gay F. Solomon General Internal Medicine Clinic
Division of Combined Internal Medicine and Pediatrics
UT Southwestern Medical Center

Background and Aims

- Two-thirds of adults report at least one Adverse Childhood Experience (ACE) such as abuse, neglect and/or household dysfunction.
- The more ACEs, the higher the chance for an illness or health risk behavior; associations include heart and lung disease, sleep issues, obesity, early death, depression, substance abuse, mental health issues, headaches and autoimmune disease.
- Intergenerational effects of ACEs are also seen: higher odds of hyperactivity and diagnosis of emotional disturbance in children with parental ACEs.
- We could potentially intervene on this cycle by screening early for ACEs and providing information and resources as indicated.
- This poster describes the first PDSA (Plan-Do-Study-Act) cycle of a Quality Improvement project to incorporate ACEs screening into routine pediatric visits at a resident continuity clinic.

Methods and Strategy

- The Center for Youth Wellness ACEs Questionnaire was attached to the paperwork packets already in use for the 9-month well child checks (WCC) by medical assistants.
- In anticipation of positive screening, resource lists were collected and brochures created for the following domains: food insecurity, mental health, housing insecurity, domestic violence.

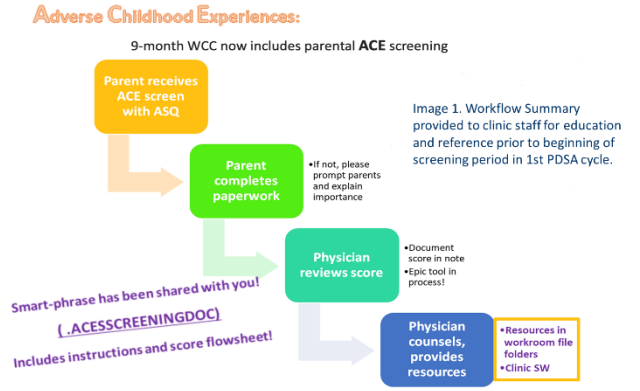


Image 1. Workflow Summary provided to clinic staff for education and reference prior to beginning of screening period in 1st PDSA cycle.

Measurement of Improvement

- For this first PDSA cycle, completion of ACEs screen at the 9-month well child check was measured to gauge improvement in clinic screening for toxic stress.

Children's exposure to stressful or traumatic events can lead to increased risk of health and developmental problems.

Screening for Adverse Childhood Experiences can be incorporated into routine pediatric clinic visits.

This could enable us to identify at risk children, and then to help decrease the dose of toxic stress and build resiliency.

UT Southwestern Medical Center

Data and Observations

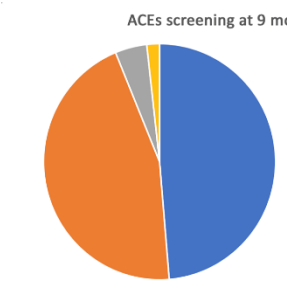


Chart 1. ACEs screening completion at all completed 9-month WCCs from 3/2021-3/2022.

Percentage of ACEs Screening at 9-month WCC	Overall	Resident Visits
No screening	49	47
Completed	45	47
Screen not completed by parent	4	2
Screen not given to parent	2	4

- Attending only visits were less likely to result in ACEs screening completion than precepted visits.
- Of completed ACEs screeners, the scores ranged from 0 to 2 (Median 0).

Lessons Learned

- Utilizing current screening framework for new topics is an easy and effective method but requires monitoring to ensure persistence.
- Anecdotally, parents and clinic staff appreciate the effort to screen for ACEs.
- Most patients screened in our clinic did not report significant ACEs.
- Maintaining an up to date and useful collection of community resources is challenging.
- The health system informatics team can create supportive tools within Epic.

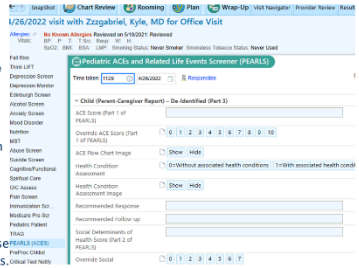


Image 2. Screenshot of Epic tool built for ease of documentation and future assessments.

Next Steps

- Evaluate ease of ACEs screen administration and consider transition to pre-visit electronic delivery.
- Evaluate patient and clinic staff perception of ACEs screening.
- Incorporate ACEs screening into an additional routine clinic visit (9 years).
- Re-train clinic staff on ACEs screening using new Epic tool.
- Update, verify, and add to current community resource lists and brochures.
- Facilitate community resource linkage with checklist for patients to request specific types of help.

Contact Rebecca.Duron@UTSouthwestern.edu for more info or questions.

This project would not have been possible without the equal efforts of co-authors, wonderful clinic staff, willing co-residents, partners in Information Resources, and encouraging attending mentors. Thank you.

Chelsea Burroughs MD - Determining Parental Core Values Regarding Complex Decision Making in the Neonatal Intensive Care Unit

Primary mentor name	Munoz-Blanco, Sara
Primary mentor's department / division	Department of Pediatrics/Neonatal-Perinatal Medicine and Palliative Care
Authors	Chelsea Burroughs: Department of Pediatrics; Michael Price: Department of Neonatology; Shubhangi Mehra: UT Southwestern Medical School; Stockton Beveridge: Department of Palliative Care; Sara Munoz-Blanco: Department of Neonatology and Department of Palliative Care
Scholarship category	Quality / Process Improvement; Clinical
Study Purpose	Given the intricacy in making decisions for infants with medical complexity, as well as the long-term consequences, our project aims to identify the primary values that parents hold most important in making these decisions for their infants within neonatal intensive care units.
Key findings:	We found that 62% of families interviewed reported having to make difficult decisions while in the NICU: surgical procedures, EEGs, tracheostomies, and DNR status changes. Overall, the most important value to parental decision making was their child's happiness and the least important was having a shorter hospital stay. When asked to rank, parents rated child's happiness, future physical abilities, and length of life as the most important factors when making decisions. Lastly, a majority (91%) of parents stated they would like to talk to a mixture of spouse and family prior to making difficult decisions.

Determining Parental Core Values Regarding Complex Decision Making in the NICU

Chelsea Burroughs, MD[1], Michael Price, MD[3], Shubhangi Mehra[5], Stockton Beveridge, MD[1,2,4], Sara Munoz-Blanco, MD[1,3]
Department of Pediatrics[1], Department of Anesthesiology & Pain Management[2], Neonatal-Perinatal Medicine[3], Palliative Care[4], and UT Southwestern Medical School[5], UT Southwestern Medical Center, Dallas, TX

Abstract

Parents of NICU infants with complex or critical illness frequently make difficult decisions for their infants. Given the intricacy in making decisions for infants with medical complexity, as well as the long-term consequences, our project aims to 1) identify the primary values that parents hold most important when making these decisions; 2) determine if parents perceive their values are upheld during discussions about treatment plans. We created the Family Values Assessment Survey, to identify overlapping values and life factors parents used when making decisions for their infants which could help providers better assist families when making medical decisions.

Objective

To determine the core values or beliefs that parents use when making complex medical decisions for their infants within the Neonatal Intensive Care Unit (NICU).

Background

Parents of complex or critically ill infants within the NICU are often faced with difficult decisions about care that have lifelong repercussions. It has been observed that there is frequently a lack of communication, or shared decision making, when making these decisions. In a study done by Scheunemann et. al, intensive care patients' values and preferences were discussed in only 68% of meetings and important end of life considerations such as goal functioning only 35% of the time (1). The Center to Advance Palliative Care (CAPC) has suggested automatic palliative team consults in the NICU for patients with severe BPD, grade IV IVH, PVL, moderate to severe HIE, and severe birth asphyxia; suggestions also include very low birthweight infants (2).

Cohort

Parents whose infant is receiving care in either Children's Medical Center Dallas or Parkland Health NICUs, or at Children's Medical Center Thrive Clinic, is admitted to the NICU for at least 3 weeks, and meets at least one of the following CAPC criteria (listed below):

1. Extreme prematurity (<28 weeks) with concomitant severe BPD, Grade IV IVH, or PVL
2. Severe birth asphyxia
3. Moderate to severe hypoxic ischemic encephalopathy
4. Very low birth weight (<1500g)
5. Congenital abnormalities

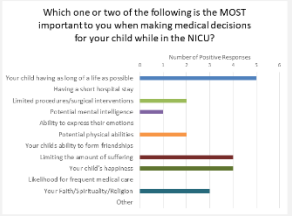
Methods

- Survey questions created by authors, then reviewed and selected based on consensus
- Participant surveys in English or Spanish using RedCap
- Descriptive statistics used for Likert scale, ranking, multiple choice questions
- Ongoing qualitative content analysis used for open-ended questions

Results

Demographic Category	Frequency	Percentage	Demographic Category	Frequency	Percentage	Demographic Category	Frequency	Percentage	Demographic Category	Frequency	Percentage
Parental Age (years)			Race			Gestational Age at Birth (weeks)			Relationship		
18-21	1	10%	White	3	33%	< 27 weeks 6 days	5	50%	Mother	9	90%
21-26	2	20%	Black	3	33%	28-32	1	10%	Father	1	10%
27-40	5	50%	Asian	1	12%	32-36	2	20%	Annual Income of Household		
>40	2	20%	Other	2	22%	>37	2	20%	$20,000 or less	1	12.5%
Primary Language			ethnicity			Infant Age at Time of Survey (days)			$20,000-35,000	2	25%
English	8	80%	Not Hispanic/Latino	6	75%	<22	0	0%	$35,000-50,000	2	25%
Spanish	1	10%	Hispanic/Latino	2	25%	22-28	1	10%	$50,000-100,000	0	0%
Other	1	10%				29-59	0	0%	$100,000-150,000	1	12.5%
						>60	9	90%	Greater than $150,000	1	12.5%
									Unknown	1	12.5%

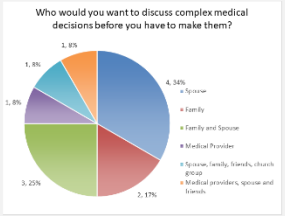
Table 1: Results of self reported parent demographics across both Parkland Hospital and Children's Medical Center NICUs.

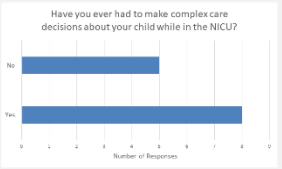


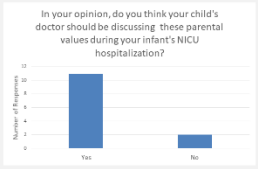
Rank how important each element when making medical decisions:	1	2	3	4	5	
Length of life	8%	0%	8%	0%	**84%**	
Hospital stay	**25%**	8%	50%	0%	17%	
Limiting interventions	0%	17%	17%	41%	25%	
Mental intelligence	0%	8%	0%	25%	67%	
Emotional intelligence	0%	0%	8%	25%	67%	
Physical abilities	0%	0%	0%	17%	**83%**	
Future friendships	8%	8%	25%	34%	25%	
Limit suffering	0%	0%	15%	8%	77%	
Happiness	0%	0%	0%	0%	**100%**	
Complex care	0%	0%	15%	23%	63%	
Faith/Religion	**15%**	0%	15%	23%	47%	

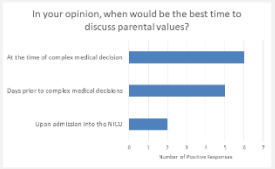
Legend: 1 – Least Important, 5 – Most Important

Table 2: Results of Likert scale asking participants to rank importance of each category when making medical decisions









Discussion

- 62% of families interviewed reported having to make difficult decisions such as: surgical procedures, EEGs, tracheostomies, and code status (e.g. DNR)
- Overall, the most important value in parental decision-making was their child's happiness and the least important was having a shorter hospital stay
- When asked to rank, parents rated child's happiness, future physical abilities, and length of life as the most important factors when making decisions
- A majority (91%) of parents stated they would like to talk to a mixture of spouse and family prior to making difficult decisions
- Approximately 54% of families surveyed had palliative care involved at some point during their child's NICU stay

Conclusions

- Survey results suggest some parental values were frequently more important to parents (such as quality of life, length of life, and possible future disabilities), which could help providers counsel parents when making complex decisions
- Just over half of families had palliative care subspecialty involvement and a large majority preferred to involve their spouse and/or family in medical decision making. Earlier palliative care involvement could help parents identify their personal values, guide parents through discussions with spouses and family members, and aide in decision making

Future Directions:

- Continue survey data collection
- Conduct semi-structured interviews with parents until thematic saturation reached
- Create a system to identify patients that would benefit from earlier palliative care consults

Acknowledgements

- Mentors: Sara Munoz-Blanco and Stockton Beveridge
- Anusha Naeem, UT Southwestern Medical School
- Department of Neonatal-Perinatal Medicine, Parkland Hospital
- Department of Neonatal Perinatal Medicine, Children's Medical Center

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Hannah Justice MD - Barriers to mental health care utilization in a large pediatric residency program

Primary mentor name	**Claussen, Karin. Soffer, Sarah.**
Primary mentor's department / division	Department of Pediatrics
Authors	Hannah Justice, Department of Pediatrics; Karin Claussen*, Department of Pediatrics; Sarah Soffer*, Department of Pediatrics
Scholarship category	Quality / Process Improvement
Study Purpose	The aim is to quantify the burden of mental health concerns in pediatric residents via standardized clinical questionnaires and subjective report and to identify barriers to accessing professional mental health services in the UT Southwestern Pediatric Program.
Key findings:	A. Using standard screening tools, we found that 11% of pediatric residents screened positive for symptoms of depression and 28% screened positive for symptoms of anxiety in the two weeks prior to the survey. B. Seventy one percent of residents reported having had a concern they were clinically depressed and 63% reported having had a concern they were clinically anxious at some point during residency. C. While 43% of residents reported that they have accessed mental health care during residency, 24% of residents reported a desire to access mental health care but have not been seen. D. The three most commonly identified barriers to accessing mental health care were inflexible schedule or lack of time (96%), preference to manage on my own (61%), and guilt about burdening colleagues (54%).

Barriers to mental health care utilization in a large pediatric residency program

Hannah Justice, MD[1] Karin Claussen, MD[1,2] Sarah Soffer, MD[1,2]
[1]Children's Health, Dallas TX. [2]University of Texas Southwestern Medical Center, Dallas TX

Background

- There is a high prevalence of depression and burnout amongst medical trainees[1,2].
- Standard of care management for depression includes pharmacotherapy and/or behavioral therapy.
- There are many barriers to accessing mental health care during medical training[3].
- As many as three quarters of residents affected by mental health concerns are not accessing mental health care[2,3].
- Mental health of trainees is a rising concern in medical education.

Objectives

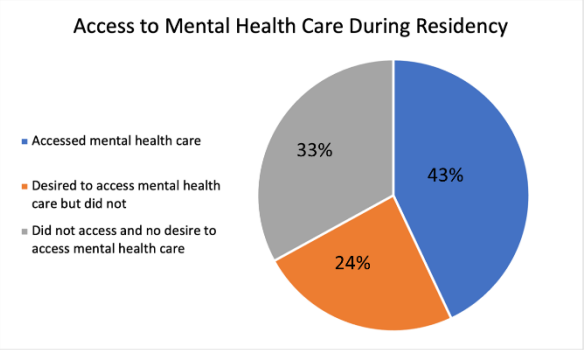
- Quantify the burden of mental health concerns in pediatric residents via standardized clinical questionnaires and subjective report.
- Describe barriers to accessing professional mental health services in the UTSW Pediatric Residency.

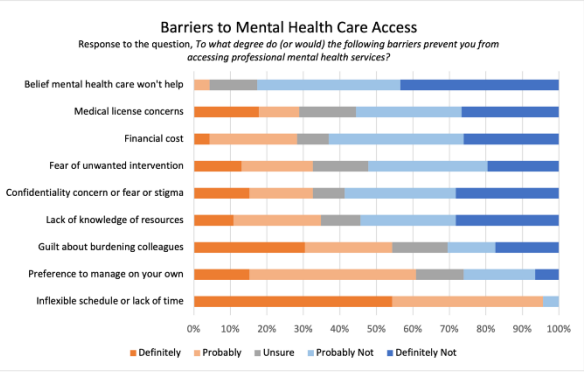
Design and Methods

- We designed a single site, cross-sectional survey to collect data including self-reported mental health care utilization and diagnoses; standardized screening tools for depression, anxiety, and burnout; and Likert scales of barriers to mental health care access.
- The survey was distributed to pediatric residents in November 2021 via RedCAP. Response was voluntary and anonymous.

Results

Survey Response Rate: 40% (46 of 115)





Mental Health Screenings:

- PHQ-2 (Depression): 11% positive
- GAD-2/Mini (Anxiety): 28% positive
- MBI-2 (Burnout): 70% positive
- During residency, have you had concerns you were clinically anxious at any point? 71% responded yes
- During residency, have you had concerns you were clinically depressed at any point? 63% responded yes

Conclusions & Future Directions

- The discrepancy between objective and subjective reports of anxiety and depression is most likely attributable to a difference in timeframe (i.e. "last 2 weeks" for objective screen versus "during residency" for subjective screen).
- The top barriers to accessing care were inflexible schedule or lack of time, a preference to self manage, and guilt about burdening colleagues.
- Future interventions targeted at barriers to accessing care are needed with the goal that any resident desiring access to mental health care can readily receive it.

Citations

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Matthew Hibbs MD - Are You All "Write": A pediatrics-centric narrative medicine curriculum to reduce resident physician burnout

Primary mentor name	Beveridge, Mark
Primary mentor's department / division	Palliative Care
Authors	Matthew Hibbs, Mark Stockton Beveridge
Scholarship category	Quality / Process Improvement
Study Purpose	To promote residents' well-being by implementing a curriculum that utilizes art and narrative literature to explore the complexity of medical practice in a safe, nonjudgmental environment
Key findings:	Qualitative results indicate the pediatrics-focused narrative curriculum is relevant to residents' work Majority of residents found the reflections to be satisfactory and meaningful WBI pre- and post-assessments were administered, but insufficient numbers limit determination of statistical significance

Are You All "Write": A pediatrics-centric narrative medicine curriculum to reduce resident physician burnout

Matthew Hibbs, MD[1], Mark Stockton Beveridge, Jr., MD[2]
Children's Health, Dallas, TX

UT Southwestern Medical Center

children's health

BACKGROUND

- Physician burnout has been linked to poor outcomes for both physicians and their patients[1]
- Depressed pediatric residents are more likely to make medication errors compared to their mentally well colleagues[1]
- Studies have shown a rise in physician burnout among residents, increasing their risk for poor mental health and depression[2]
- Reflective writing workshops have been shown to have potential to foster personal awareness and positive associations with work increasing resiliency[5]
- Narrative medicine is an application of art within medicine as a catalyst to promote reflection on the complexity of medicine and foster empathy[4]

OBJECTIVE

- To promote residents' well-being by implementing a curriculum that utilizes art and narrative literature to explore the complexity of medical practice in a safe, nonjudgmental environment

METHODS

- Collected an anonymous needs assessment survey from 60 UTSW Pediatric Residents
- Developed a modified pediatrics-focused narrative medicine curriculum based on Dr. Abigail Winkel's from NYU School of Medicine[4]
- Facilitated monthly, small group (four to seven residents) virtual reflections (via MS Teams), guided by Children's Health RISE team

NEEDS ASSESSMENT

- Select data from initial needs assessment:

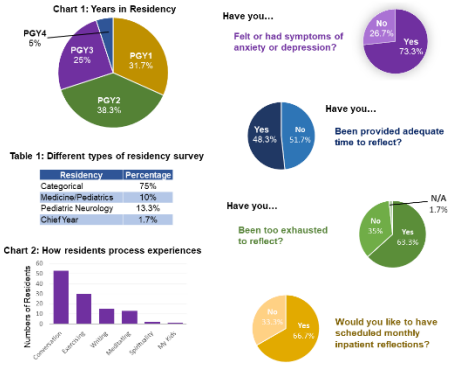


Table 1: Different types of residency survey

Residency	Percentage
Categorical	75%
Medicine/Pediatrics	10%
Pediatric Neurology	13.3%
Chief Year	1.7%

SAMPLE

- **Session theme:** "Work-Life Balance"
- **Introduction:** What does work-life balance mean to you?
- **Read narrative literary selection(s):**

Computer stares back-
beyond the window birds sing
hands leave the keyboard
- Jojoba Mansell[6]

- **Write narrative prompt(s):** Write a haiku about a moment you felt "balance"
- **Share and discuss**

WRITINGS

- Excerpt from "Our Calling" session:

"…Being in medicine, I've learned the weird
integration between
Life and loss.
Grief and happiness.

You really can't have one without the other
So to answer the question, my days are for
A tear and a smile."

- Excerpt from "Making Mistakes" session:

"Maybe I should get that tattooed somewhere. But I don't know where on myself there is still room for it among all the 'All or nothing!' 's or 'You must be perfect' 's scrawled all over me, in [hopefully] invisible ink… In a time of my life when mistakes are both dreaded and encouraged, I cannot even accept them as my own. I fear that I am cruising through this process, wrapped in the comfort of a soft, warm, physician-in-training permit…"

- Haikus from "Work-Life Balance" session:

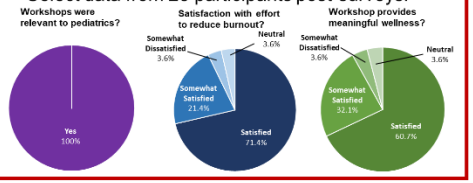
"Sunlight on my face
I breath in life-giving fresh air
Breath out inner stress."

"My eyes leave the page
For a moment I forget
The weight of the words."

"Crushing weight of to dos
Rare time with husband is calling me
Couch beckoning me."

RESULTS

- Select data from 28 participants post-surveys:



CONCLUSIONS

- Qualitative results indicate the pediatrics-focused narrative curriculum is relevant to residents' work
- Majority of residents found the reflections to be satisfactory and meaningful
- WBI pre- and post-assessments were administered, but insufficient numbers limit determination of statistical significance

LIMITATIONS

- Sessions limited to virtual format due to COVID
- Low resident participation due to availability and time constraints
- Self-selection bias with resident participation

NEXT STEPS

- Share post-session summary document
- Improve timing of future narrative sessions to better facilitate resident participation

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Michael Hook MD - Pediatric Multiple Magnet Ingestion: A Single Center Experience

Primary mentor name	Sathe, Meghana
Primary mentor's department / division	Gastroenterology
Authors	Michael Hook: Dept of Pediatrics; Faisal Qureshi: Dept of Pediatrics, Div. of Surgery; David Troendle: Dept of Pediatrics, Div. of Gastroenterology; Meghana Sathe: Dept of Pediatrics, Div. of Gastroenterology
Scholarship category	Quality / Process Improvement
Study Purpose	Major Objectives: (1) Identify risk factors that predict success with monitoring versus need for endoscopic or surgical intervention in MMI. (2) Outline differences between various teams that admit MMI cases. (3) Define trends that can aid clinicians in preventing MMI or complications from MMI.
Key findings:	(1) Longer time to presentation, symptoms at presentation, higher number of ingested magnets, and parents not knowing magnets were ingested were risk factors for surgical intervention (2) Management/Outcomes between teams were largely similar. General Pediatrics tended to have higher frequency of radiographs and laxative use, possibly reflecting higher medical complexity. General surgery tended to have a lower time to intervention. (3) It is suspected that proximity to magnets is the primary risk factor for MMI, which may have been exacerbated with ‘stay-at-home’ orders during the COVID-19 pandemic

Pediatric Multiple Magnet Ingestion: A Single Center Experience

Michael Hook, M.D., Faisal Qureshi M.D., David Troendle M.D., Meghana Sathe M.D

children's health

UTSouthwestern Medical Center

Background:

- Multiple magnet ingestion (MMI) is a high-risk foreign body ingestion sub-type, defined by ingestion of ≥2 magnets or a magnet with a magnetic object
- MMI is a challenging clinical scenario due to potential serious complications and wide range of management options ranging from monitoring to surgical intervention
- There is a dearth of information on risk factors, management guidance, and outcomes in MMI
- This study, to our knowledge, is the largest review of MMI cases present in the current literature

Study Design:

- Retrospective chart review of MMI cases at Children's Health Medical Center of Dallas (CMC) from 2009-2021
- Included Patients: (1) <18yr of age, (2) Confirmed MMI by radiography or direct visualization
- Demographic and clinical data were extracted and compiled in accordance with study protocol outlined in IRB #UP00064

Major Objectives:

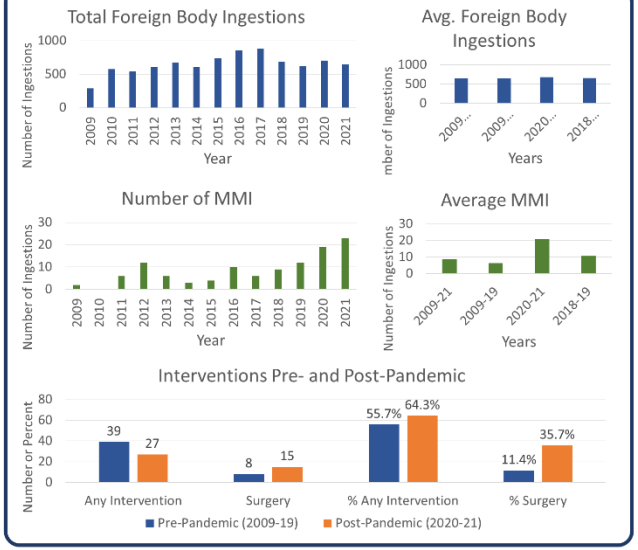
1. Identify risk factors that predict success with monitoring versus need for endoscopic or surgical intervention in MMI
2. Outline differences between various teams that admit MMI cases
3. Define trends that can aid clinicians in preventing MMI or complications from MMI

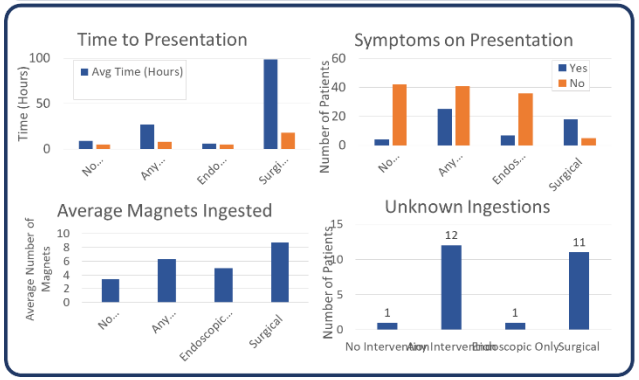
Chart Filtering:

	Emergency Medicine	General Pediatrics	Gastroenterology	General Surgery	Otolaryngology
Number of Patients	26	13	50	21	2
Laxative Use	8 (31%)	12 (92%)	30 (60%)	5 (24%)	0 (0%)
Serial Radiograph Monitoring	N/A	12 (92%)	34 (68%)	8 (38%)	0 (0%)
Avg. Number of Radiographs	N/A	4.67	3.97	2.63	0
Avg. Length of Stay (Hr)	N/A	56.2	35.8	69.4	4
Resolved at Home	26 (100%)	2 (15%)	15 (30%)	4 (19%)	0 (0%)
Spontaneous Passage	26 (100%)	4 (31%)	21 (42%)	5 (24%)	0 (0%)
Endoscopy	N/A	8 (62%)	39 (78%)	2 (9%)	2 (100%)
Surgery	N/A	3 (23%)	4 (8%)	16 (76%)	0 (0%)
Avg. Time to Intervention (Hr)	N/A	29.27	32.76	6.45	3.5
Complication Post-Op	N/A	0 (0%)	1 (2%)	2 (9%)	0 (0%)
Re-Presentation	2 (13%)	1 (8%)	3 (6%)	3 (14%)	0 (0%)

Conclusions:

- Longer time to presentation, symptoms at presentation, higher number of ingested magnets, and parents not knowing magnets were ingested were risk factors for surgical intervention
- Management/Outcomes between teams were largely similar. General Pediatrics tended to have higher frequency of radiographs and laxative use, possibly reflecting higher medical complexity. General surgery tended to have a lower time to intervention.
- It is suspected that proximity to magnets is the primary risk factor for MMI, which may have been exacerbated with 'stay-at-home' orders during the COVID-19 pandemic





Sonia Allouch MD - Improving HPV vaccination rates in CHMG and AYA clinic

Primary mentor name	Francis, Jenny
Primary mentor's department / division	Pediatrics /Adolescent Medicine
Authors	Sonia Allouch*1,2,MD, Jenny K. R. Francis1,2, MD, MPH, Sitara M. Weerakoon3,4, PhD MPH, Stephanie E. Trenkner1,2, MD, Julia C. Durante1,2, MD, Nancy Kelly1,2,MD, Matthew S. Mathew3,4, MS, Serena L. Lucas2, RN, BSN, MBA, Jasmin A. Tiro5, PhD Affiliations: 1 Department of Pediatrics, University of Texas Southwestern Medical Center, Dallas, Texas; 2 Children's Health System of Texas, Dallas, Texas; 3 University of Texas Health Science Center School of Public Health, Dallas, Texas; 4 Center for Pediatric Population Health, Dallas, TX; 5Department of Population and Data Sciences, University of Texas Southwestern Medical Center, Dallas, Texas
Scholarship category	Quality / Process Improvement
Study Purpose	Use the process map developed in 2020 to implement interventions that target gaps identified in order to improve HPV vaccination at CHMG primary care.
Key findings:	EPIC EMR system upgrade in CHMG and AYA clinic including: New notification system for providers to alert for missing / due HPV vaccination. EPIC electronic letter sent to patients >9yo eligible for HPV vaccination. EPIC MyChart notification "HPV vaccine is overdue" prior to clinic visit. ImmTrac –EPIC bidirectional data exchange Education and raising awareness of HPV vaccination among clinic staff, residents, and physicians. HPV vaccination posters (English and Spanish) for clinic examination rooms.

Improving HPV vaccination rates in CHMG and AYA clinic

Sonia Allouch, MD, Jenny K. R. Francis, MD, MPH, Sitara M. Weerakoon, PhD MPH, Stephanie E. Trenkner, MD, Julia C. Durante, MD, Nancy Kelly,MD, Matthew S. Mathew, MS, Serena L. Lucas, RN, BSN, MBA, Jasmin A. Tiro, PhD

BACKGROUND

- Human papillomavirus (HPV) is the most common STD in the USA.
- HPV vaccine was first introduced in 2006 with proven efficacy to prevent 90% of certain cancers.
- In Texas, the completion rates of HPV vaccine is less than 50%.
- The American Cancer Society (ACS) and Centers for Disease Control (CDC) recommend vaccination should start at the minimum age of 9 years.

OBJECTIVE

Continuing the work started by Dr. Stephanie Trenkner, a former resident, graduated in 2020, this project aims to use the process map developed in 2020 to implement interventions that target gaps identified in the process map (update records, improve education, optimize EHR, address communication) in order to improve HPV vaccination at Children's Health Medical Group, Primary Care.

METHODS

RECORDS → EPIC EHR system upgrade in CHMG with ImmTrac2.0 –EPIC bidirectional data exchange to pull in vaccine record to HER

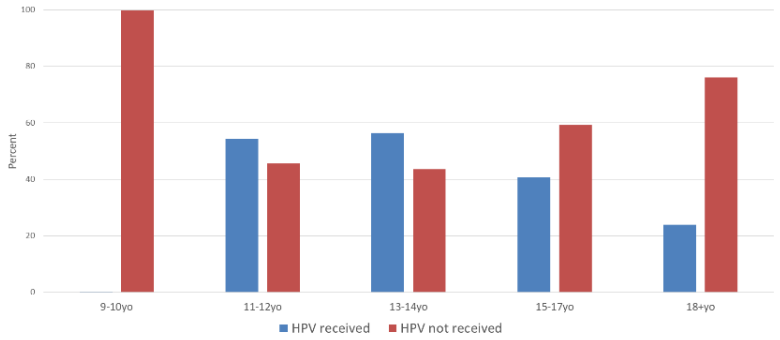
EDUCATION →Raise awareness of HPV vaccination among clinic staff, residents and physicians through HPV 101 with CME, and resident didactics in continuity clinic about vaccine hesitancy

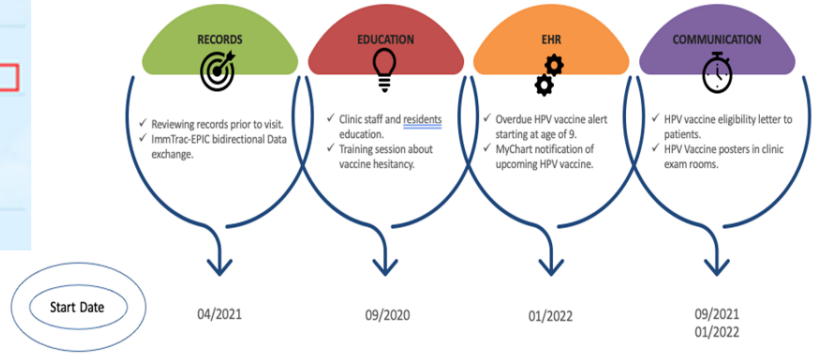
EHR → New notification system for providers "Care Gaps" to trigger for 9yos when HPV vaccine is missing

COMMUNICATION → HPV vaccination posters (English and Spanish) & EPIC electronic HPV vaccination eligibility letter to patients >9yo.

RESULTS

HPV Vaccine Opportunity Received among Encounters where a Patient Needed One or More Doses, 1/1/2019 - 12/31/2021





CONCLUSIONS

- This project used the Plan-Do-Study-Act (PDSA) model with an aim of improving HPV vaccination rates by 2.5% annually in clinic by targeting the 9-10yo age group since 2020.
- Next steps:
  - Identify an intern to continue this project forward.
  - Develop a run chart with HPV vaccination by age group per month since 2020 and mark when each intervention occurred.
  - Develop a key driver diagram based on the process map to categorize each intervention.
  - Run a difference-in-difference analysis to determine which interventions have the strongest effects.
  - Scale the project up to other sites (Rees-Jones, AYA, ENT, and possibly inpatient services).

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Swetha Kotamraju MD - Improving Dietician Follow up of Enterally Fed Patients in an Outpatient Subspecialty Clinic

Primary mentor name	Barlow, Sarah; Sathe, Meghana
Primary mentor's department / division	Pediatrics/Gastroenterology
Authors	*Kotamraju, Swetha, MD, Dept of Pediatrics; Ngai, *Derek, MD, Dept of Pediatrics, Division of Gastroenterology; Do, Phinga, MD, Dept of Pediatrics, Division of Gastroenterology; Halloway, Lauren MCN RD LD CNSC, Dept of Pediatrics, Division of Gastroenterology; Luffy, Robin APRN PNP-PC, Dept of Pediatrics, Division of Gastroenterology; Rockwell, Jill, RD LD CNSD, Dept of Pediatrics, Division of Gastroenterology; Barlow, Sarah, MD, Dept of Pediatrics, Division of Gastroenterology; Sathe, Meghana, MD, Dept of Pediatrics, Division of Gastroenterology
Scholarship category	Quality / Process Improvement
Study Purpose	A GI-Nutrition Taskforce recommended that enterally-fed patients be evaluated by dieticians at least every 6 months, in accordance with national guidelines. We will increase the median % compliance, or % of 6-month dietician referrals needed that are successfully placed by GI providers from 55% to 70% by Dec 31, 2021 for enterally fed patients cared for at the CMC GI Clinic.
Key findings:	-Both the schedule and smartphrase intervention increased the median % compliance to 67% and 77% respectively, surpassing our aim of 70%. -Both interventions focused on reminding providers of the guidelines by optimizing use of the clinic schedule or note templates in the electronic medical record. -The smartphrase intervention was more successful because it was optimally timed in workflow to facilitate immediate action and made the process of referral more convenient. -Standardizing care among providers in a large, multidisciplinary clinic is best achieved with solutions that model existing routines in provider workflow as well as allow providers to act on change immediately and conveniently. -The smartphrase intervention is the first step in creating an EMR-based clinical decision making tool to improve nutritional status of enterally fed patients by impacting timely referral and serving as a reminder of other regular health maintenance assessments, such as obtaining annual nutrition labs and bone health assessments.

Improving Dietitian Follow-up of Enterally Fed Patients in an Outpatient Subspeciality Clinic

UT Southwestern Medical Center

Kotamraju, Swetha, MD[1,2]; Ngai, Derek, MD[2]; Do, Phinga, MD[2]; Halloway, Lauren MCN RD LD CNSC[1]; Luffy, Robin APRN PNP-PC[1]; Rockwell, Jill, RD LD CNSD[1]; Winser-Bean, Christine APRN FNP[1]; Barlow, Sarah, MD[2]; Sathe, Meghana, MD[2]

[1]Pediatrics,Children's Medical Center, Dallas, TX [2]Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

childrenshealth

Background and Problem

Importance of Monitoring Enteral Nutrition

- The American Society for Parenteral and Enteral Nutrition Safe Practices for Enteral Nutrition Therapy (ASPEN) recommends a multidisciplinary team monitor enteral nutrition (EN), including regular nutritional assessments by dietitians
- Frequent nutritional monitoring prevents adverse effects and allows for achieving as well as maintaining appropriate nutritional status for patients requiring prolonged enteral nutrition

Children's Medical Center (CMC) Enteral Nutrition Taskforce

- CMC cares for over 4000 enterally-fed patients each year
- CMC Gastroenterology (GI) providers noted enterally-fed patients often experienced inconsistencies in care, leading to delay in care
- GI-Nutrition Taskforce created recommendations based on 2017 ASPEN guidelines to improve care of enterally-fed patients
- Taskforce recommended that dietitian evaluation should be conducted at least every 6 months
- Taskforce created this project to study and encourage regular dietitian evaluations of enterally fed patients

Project Aims

Improving the Rate of Dietitian Follow-Up

Global Aim

We aim to improve the nutritional care of patients dependent on EN at CMC.

Specific Aim

We will increase the median % compliance from 55% to 70% by Dec 31, 2021 for enterally fed patients cared for at the CMC GI Clinic.

% Compliance is defined as the % of 6-month dietitian referrals needed that are successfully placed by the GI provider in GI clinic, in accordance with taskforce guidelines

Project Design

Quality improvement (QI) tools used to investigate practices and create interventions

DMAIC ***(Define-measure-analyze-improve-control)***

Primary project framework

Define	• Created team • Reviewed national and local guidelines • Designed project structure and identified QI tools to utilize • Identified stakeholders or those affected by intervention • Created project charter with aims, resources, and team members

Measure	• Produced process map of patient follow-up with GI providers and dietitians from initiation to discontinuation of EN (Figure 1)
	• Constructed fishbone diagram of factors contributing to suboptimal dietitian follow-up (Figure 2)
	• Performed retrospective analysis of dietitian follow-up of enterally-fed patients from 2017-2020 (n=28) at CMC
	  ▪ Average 6-month dietitian follow-up rate was only 65% and primarily in GI Clinic
	  ▪ Only 38% of GI clinic visits included dietitian visit
	• Suggested that a major factor was lack of awareness among providers of best practice recommendations
	• Began developing project aims, above
	• Created key drivers diagram to determine more specific contributing factors and propose solutions(Figure 3)

Analyze	• Collected and analyzed baseline data over 4 weeks ▪ Baseline median % compliance was 55%
Improve	• Created interventions aimed at improving provider awareness of dietitian referral guidelines, reminding providers of referrals, and simplifying the process of determining if referral is needed (Figures 4 and 5) • Used multiple PDSA cycles to optimize rollout of each intervention (Example in Figure 6) • Measured % compliance each week during implementation of each intervention (Figure 7)
Control	• Future studies to be completed

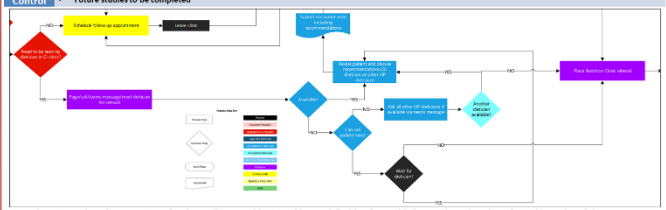


Figure 1: Section of Process Map of Patient Follow-up with GI Providers and dietitian from initiation to Discontinuation of EN. this section of the process map depicts the process in GI clinic of GI providers placing referrals for either dietitian evaluation in GI or nutrition clinic. The process is complex, involving several people and two different clinics. It should be noted that dietitian evaluation of patients entirely depends on GI provider referral.

Project Design (Cont.)

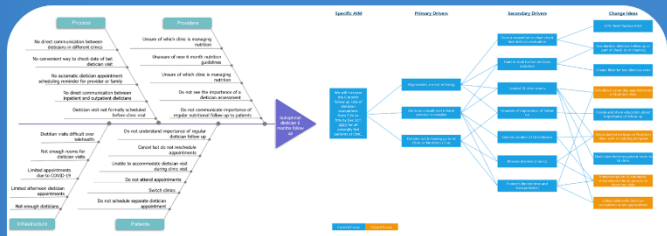


Figure 2: Fishbone Diagram of Factors Contributing to Suboptimal Dietitian Follow -up of Enterally-Fed Patients. The four categories of factors identified were process, providers, infrastructure, and patients. Major factors identified that could be most easily addressed were a complex process and GI provider lack of awareness.

Figure 3: Key Drivers Diagram. This diagram was created to examine what specific factors lead to larger issues such as poor referral rate, a complex process, and poor dietitian follow-up rate, as well as to propose various solutions that addressed these specific factors. These proposed solutions were further developed into the interventions used during the improve phase.

Interventions

Schedule Intervention (Figure 4)

Two columns were added to the schedule of each GI provider's dashboard. The first column identifies patient with a feeding tube with a green circle in the first column. The second column lists the date of the last dietitian note in the chart.

Smartphrase Intervention (Figure 5)

In addition to schedule intervention, a smartphrase about nutrition to the standardized note template used by GI providers for clinic appointments was implemented. The smartphrase prompts the provider to indicate if the patient has a feeding tube. If so, the smartphrase automatically populates in the tube information and the date of the last dietitian evaluation. The smartphrase also prompts the provider to document the current feeding regimen.

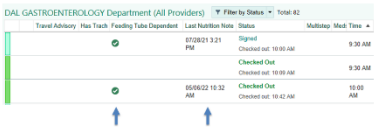


Figure 4 Schedule Intervention: Arrows pointing to two columns added

Figure 5: Smartphrase Intervention: Providers can pick in the yellow dropdown menu of the smartphrase to either automatically populate the last documented feeding tube and dietitian note information or indicate that patient does not have a tube.

PDSA ***(Plan-Do-Study-Act)***

Secondary project framework to develop interventions during Improve phase

Plan	• Worked with CMC electronic medical record team to add two columns to GI provider clinic schedule • Column 1: green dot present if feeding tube present • Column 2: Date of last dietitian note in chart
Do	• Implemented for providers who had clinic on one selected weekday • Met with each provider to add columns to their clinic schedule • Measured compliance of dietitian referrals

Study	• Found sample sizes to be small and highly variable between providers
	• Provider feedback:
	  ○ patients often misidentified as having a feeding tube
	  ○ lack of reminder to refer again during actual appointment

Act	• Expanded intervention to providers on two weekdays • Begin working on intervention that continued to automatically identify patients with feeding tubes and list the date of the last dietitian note as well as remind providers during the appointment to think about referral

Figure 6: Example PDSA Cycle For Schedule Intervention

Results

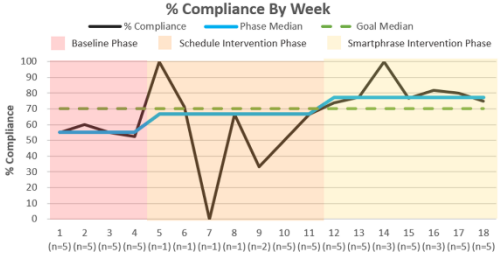


Figure 7: Run Chart of % Compliance By Week. % compliance was measured for each week of the baseline, schedule intervention, and smartphrase intervention phases, for a total of 18 weeks, ending in November 2021. N= days measured in each week. The median for each phase is represented by the blue line and was 55%, 67%, and 77%, respectively. The goal median was 70%. Therefore, the aim of increasing median % compliance from 55% to 70% by December 2021 was achieved and surpassed during the implementation of the smartphrase intervention.

Conclusions

- Both interventions increase the rate of referral by providers to dietitians, in compliance with GI-Nutrition EN guidelines and were successful interventions for this setting
- Both interventions focused on reminding providers of the guidelines by optimizing use of the electronic medical record
- Suggests that prior poor compliance rate was largely due to:
  - Provider's lack of awareness of guidelines
  - Inconvenience (complex process to find last dietitian evaluation)
- Suggests that prior poor compliance rate was not due to limitation of resources, as previously thought
- Schedule intervention raised referral rate but was less successful
  - Providers required to remember referral prior to seeing patient
  - Inaccuracies in identifying patients likely made providers use it less
- Smartphrase intervention more successful because of optimal timing in workflow
  - Providers often fill out note template during appointment
  - Smartphrase in template allowed providers to act on reminder and verify smartphrase information with patient directly
- Standardizing care among providers in a large, multidisciplinary clinic is best achieved with solutions that:
  - Model existing routines in provider workflow
  - Allow providers to act on change immediately and conveniently
- Improving referral rate to dietitians is the first step in improving care of enterally-fed patients by multidisciplinary clinical nutrition teams and ultimately, improving outcomes for these patients

Control Phase and Future Studies

- Schedule intervention continues to be in use
- Plan to measure % compliance 6-8 months after implementation to determine sustainability
- Consider further optimizing the accuracy of information populated in smartphrase
- Consider using smartphrase intervention as first step in creating comprehensive Clinical Decision-Making Tool to aid in nutritional monitoring
- Consider expanding interventions to other clinics at CMC managing EN
- GI-Nutrition Taskforce starting project to standardize lab monitoring of EN by providers in accordance with ASPEN guidelines

Acknowledgements

I would like to acknowledge Victoria Wright BS CPHQ LASS GB for her guidance in designing this project. I would also like to thank the providers at the CMC Gastroenterology Clinic for participating in this study and using the interventions created.

Donovan Berens MD - Improving Screening for Non-Alcoholic Fatty Liver Disease in a Primary Care Setting

Primary mentor name	Sendelbach, Dorothy
Primary mentor's department / division	Department of Pediatrics
Authors	Donovan Berens, Department of Pediatrics
Scholarship category	Quality / Process Improvement
Study Purpose	The aim is to improve resident non-alcoholic fatty liver disease (NAFLD) screening rates of patients who warrant evaluation based on NASPGHAN/AAP recommendations.
Key findings:	There was no statistically significant difference in NAFLD screening rates between the pre-intervention group and post-intervention groups at 3-months or 6-months. Although this project did not achieve its primary aim there appears to be a trend towards improvement in NAFLD screening rates with the intervention. Patient encounters that met inclusion criteria qualified for NAFLD screening 29% of the time. Of the patients screened 35% had an ALT greater than twice the upper limit of normal. The next step would be to create a BPA/Epic prompt to suggest NAFLD screening in qualified patients.

Improving Screening for Non-Alcoholic Fatty Liver Disease in a Primary Care Setting

UTSouthwestern Medical Center

Donovan Berens, MD[1-2]

[1]Pediatrics, Children's Medical Center, Dallas, TX; [2]Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX

children's health

Background

- Non-alcoholic fatty liver disease (NAFLD) is the leading cause of pediatric liver disease and a major cause of adult end-stage liver disease (ESLD), liver transplantation, and cirrhosis.[1] NASPGHAN and the AAP recommend screening in children beginning at age 9-11 with a body mass index (BMI) greater than the 95th percentile or patients at 10 years with a BMI greater than the 85th percentile with risk factors such as central adiposity, insulin resistance, dyslipidemia, family history of NALFD/NASH, and OSA.[1-2] The screening test of choice is alanine aminotransferase (ALT).[1-2] Abnormal results concerning for NAFLD are greater than two times the upper limit of normal (ULN). The ULN for males is >26 and females >22.[1-2] Screening for NAFLD is encouraged because it may identify liver injury due to modifiable factors prior to irreversible ESLD.[1]

Aim Statement

- The rate of NAFLD screening will be increased by 20% above baseline levels in patients at the Dallas Medical Group (formerly CHPG) resident clinic who warrant screening based on NASPGHAN/AAP recommendations by 3 months after the resident cohort has received the intervention (resident education/badge tool).

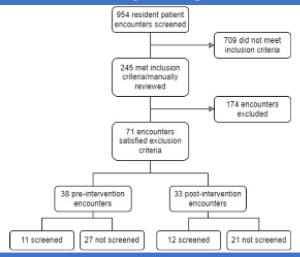
Methods

- Residents were provided with a badge summarizing NASPGHAN/AAP NAFLD screening recommendations (including GRADE rating) and had in-person instruction on the use of the badge tool.
- Pre/post-intervention screening rates were determined by electronic health record (EHR) review using Epic SlicerDicer.
- The dataset included 954 resident patient encounters over the study period.
- A total of 245 encounters satisfied inclusion criteria in Epic SlicerDicer.
- These 245 patient encounters were manually reviewed for exclusion criteria in the EHR.
- Of these encounters, 174 encounters were excluded.
- The remaining 71 encounters were evaluated to determine pre/post-intervention screening rates.
- A Chi square test was used to determine statistical significance and $p<0.05$ was defined as significant.

Inclusion Criteria
- *Encounter Type "Dallas Medical Group" OR "CHPG Medical District" AND*
- *Visit Type designated "Well Child Check" OR "Follow Up" OR "Teen Well Child Check" AND*
- *Patients see by resident providers who participated (6) AND*
- *Patients 9-18 years of age*

Exclusion Criteria
- *Patient not seen by resident*
- *Patient previously screened negative by ALT (normal range) within the past 3 years*
- *Patient previously referred to Hepatology/Liver Clinic*
- *Patient did not meet NASPGHAN/AAP NAFLD screening criteria*

Study Design



Intervention

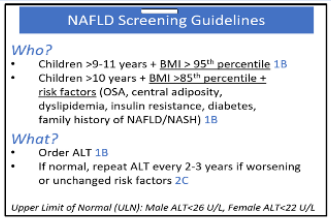


Fig 1. Front of Badge

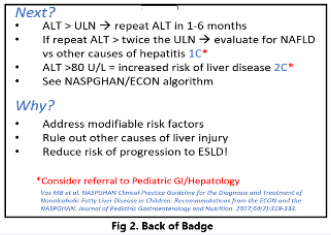


Fig 2. Back of Badge

Results

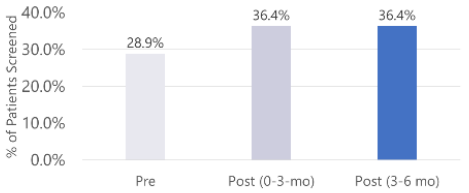


Fig 3. Percentage of Patients Screened

The percentage of patients in the study population who met criteria for NAFLD screening who were screened in the pre-intervention period, 0-3 months post-, and 3-6 months post-intervention.

	Screening Encounters	Screened	Not Screened	Chi-square Test
Pre-intervention	38	11	27	
Post-intervention (0-3-months)	11	4	7	X^2(1, N=49) = 0.208, p=0.65 (a)
Post-Intervention (3-6 months)	22	8	14	X^2(1, N=60) = 0.346, p=0.56 (b)
Post-Intervention (0-6)	33	12	21	X^2(1, N=71) = 0.444, p=0.51 (c)

Table 1. Pre/Post-Intervention Screening Rates

Screening rates were compared using Chi-square test analysis. Comparison of the pre-intervention screening rate to post-intervention rates at 0-3 months (a), 3-6 months (b), and 0-6 months (c)

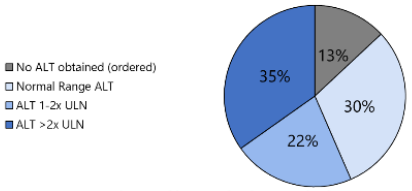


Fig 4. Resulting ALT Values in Screened Patients

	Screened (n=23)	Not Screened (n=48)
Mean Age [IQR]	13.26 [12-14]	12.3 [10-14]
Mean BMI [IQR]	98.6 [97.76-99.52]	96.5 [95.71-98.5]

Table 2. Patient Demographics

In the sample population patients that were screened for NAFLD were on average older and had a higher BMI percentile.

Conclusion

- When comparing pre/post-intervention NAFLD screening rates there was no statistically significant difference between the pre-intervention group or post-intervention groups at 0-3 months, 3-6 months, or 0-6 months.
- Although this project did not achieve its primary aim there appears to be a trend towards improvement in NAFLD screening rates with intervention.
- Significant opportunity exists for improvement in resident screening for NAFLD.
- Patient encounters that met inclusion criteria qualified for NAFLD screening 29% of the time (71/245). This is a conservative estimate as previously screened (normal) patients were excluded.
- Of patients screened for NAFLD, 35% had an ALT greater than twice the upper limit of normal warranting further investigation.

Limitations

- The 245 patient encounters which met inclusion criteria were manually evaluated in the EHR introducing risk of reviewer error.
- Intent to screen is difficult to discern via chart review and ALT may have been obtained for purposes other than NAFLD screening.
- The post-intervention period occurred during to the COVID-19 pandemic. Visits types designated as "Well Child Check," "Teen Well Child Check," and "Follow Up" decreased markedly in the post-intervention group.
- The patient population of this continuity clinic may not be reflective of the average population.

Future Directions

- An order set for obesity management or BPA in Epic (triggered by patients satisfying NASPGHAN/AAP criteria for NAFLD screening) could prompt residents to order an ALT and improve screening rates.
- A pre/post-intervention survey to assess resident comfort with NAFLD screening could identify knowledge gaps to improve future interventions.
- Further evaluation with a larger number of patient encounters could help discern if the intervention truly improves resident screening.

Works Referenced

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Artwork by Chief Resident Karin Claussen, 2021

LETTER FROM THE SECTION EDITOR:

This section serves as a forum to acknowledge our common humanity through expression of individual perspectives: ranging from reflection of coping with illness as a physician, to personal viewpoints of how our own humanity and systems affect the care of our patients. Writing, artwork, and other forms of artistic expression illuminate these nuances and vulnerabilities of humanity that we experience intimately as physicians. We hope these courageous expressions inspire your own reflection.

Sincerely,

Karin Claussen MD

Pediatric Residency Chief Resident

Medical Spanish: Reflection Essay

By Bella O'Malley, PGY2

I was really excited to be taking part in a customized elective with CHPG and Medical Spanish this elective block. I previously had some experience with Medical Spanish through an undergraduate 5 week summer study abroad program in Alcala, Spain where I spent 2 weeks learning medical Spanish terminology and another 3 weeks in a local hospital. I had taken a few Spanish classes in undergrad and ended up being just 1 Spanish class away from getting a Spanish minor, but after a 6 year hiatus from Spanish through the process of medical school and residency, much of the Spanish that I had acquired earlier in life had escaped me. Therefore, I was thrilled that I could engage in dedicated time this elective block to brush up on my Spanish, especially as much of the Children's Medical Center patient population is Spanish speaking.

Through my learning sessions with Pimsleur and Spanish conversations throughout the week, I was reminded of the familiarity I had once experienced with Spanish. Through my rotation days in CHPG, I had several Spanish-speaking families as well, and though I used an interpreter for those visits, I found myself understanding more and more of what the families were speaking in Spanish. I think being able to
communicate even a few words or simple phrases to patients in their native language creates an environment where they are able to feel more at ease. It helps develop the patient-physician relationship and can foster a greater sense of trust. I know this to be true as my grandmother who speaks Mandarin Chinese and knows limited English finds most comfort and trust in physicians who are able to speak even a few words of Chinese such as "Ni-hao" or "hello."

As the United States has always been a melting pot of diverse culture and languages, it is important that healthcare providers not only have but also embrace cultural competencies in acknowledging and appreciating every patient's unique cultural background. I am thankful to have had both CHPG and Medical Spanish in this elective block to develop these skills.

Stories and lessons of Latin women growing up in America and how they shaped who they are

By Yarah Ghotmi, PGY1

Talk #1: "I am Mexican", Bianca Barajas
In this TED talk, Bianca reflects on her time in grade school and how she felt misrepresented and misjudged simply because of how she looked. She mentions these teachers who judged her or didn't give her the same treatment as the white students who surrounded her in class.

This piece opened my eyes to two different things, 1) how do Latinx people feel in the hospital setting, whether inpatient, clinic, or the ED, do they feel misrepresented or misjudged? And 2) I reflected on my own implicit biases. It saddens me to hear Bianca's experience, to experience racism at a young age and not really be able to identify what's happening. Then because of that, blaming yourself for other people's responses. She always goes through how Americans feel about Mexico and Mexicans, and the statistics are disheartening. Imagine going to the hospital with the knowledge of these stats, being at your most vulnerable, needing help but unable to trust the people giving you care because of the biases they might carry with them.

That's why hearing this video made me get in touch with my own implicit biases, making sure I am aware of them so that I can work towards breaking them down instead of ignoring them and allowing them to guide my care of my community. For example, if I ever cared for Bianca, I would never want to make her feel unwanted or misunderstood as her teachers did.

I also want to touch base on the beautiful things she mentioned as the pillars of her Mexican culture: family, love, music, dance, and food. I hope to have the opportunity to learn more about Mexican culture through these pillars to make patients like Bianca feel safe with me as their provider.

Talk #2: "My identity is a superpower - not an obstacle," America Ferrera
America Ferrera talks about the lack of representation in Hollywood and media in general. She discusses trying to audition for roles but only being cast as the stereotypical Latina roles and being told she wasn't "Latina" enough (even though she was fully Latina). America comments on always being overlooked because the "white role" needed to be cast first. So she grew up feeling like the only way she could be seen was to change herself to fit the norm. She paints a powerful and relatable image of straightening her hair, avoiding tanning so she wouldn't get darker, losing weight, and wearing more expensive clothes. Making herself fit in more to a reality built by the media, rather than media becoming more accepting of who she is and the community she represents.

I think this resonates outside of just media and is essential in all fields, including medicine. There needs to be a greater strive for diversity and inclusion on a national level in all medical schools and residency programs. She mentions talking about this change versus actual action towards it, which is especially true in residency program recruitment - with people expressing their "diversity and inclusion committees" with a completely white-American class. I know from personal experience that in a program with less diversity in their program and faculty, I was much less willing to rank them highly. Programs should be putting a much greater level of recruitment into diversity and inclusion. It is shown that patients feel safer with someone of their own background -- this can't be a reality for everyone. Still, if we could learn from our peers and teachers about each other's cultures, we could get one step closer to supporting our community together.

America Ferrera's final point is we can't conform to this fake reality built by society. But, unfortunately, we are led to believe that we must succumb to it to be successful. However, we need to fight that resistance to accept the representation of people of color and different backgrounds on screen, in the media, and medicine.

The Intern Account: A Post-Concussive Rollercoaster

By Fatima Ahmad, PGY1

Just *two more* ED shifts before my first vacation week of intern year. Around 8:40pm on Wednesday, Nov. 10th, 2021, I was stopped at a red light at an intersection outside the Children's ER, reflecting on the day's events.

Prelude

When I arrived at work that morning, the ED bay was unusually void of staff, which I realized was due to several early-morning critical cases that were keeping the staff occupied. After seeing where I could help, I began seeing several children with asthma, croup, sickle cell crisis, and more. Being only my third day of working in the emergency department, I was still getting the hang of the fast pace and critical-thinking required of me. However, after a few patients, I prematurely began feeling "comfortable".

That is, until I reevaluated an asthma exacerbation patient. She was failing to respond to the first few breathing treatments, and her caregiver became agitated with her. "Stop fooling around and breathe properly. I don't have time for your silly games!", he yelled. I calmly explained the pathophysiology in layman's terms and how she had no control over her symptoms. His anger shifted towards me. "Don't f***ing run experiments on my child for data or I'm going to call my lawyer," he yelled. I calmly explained to him that we needed to keep an eye on her oxygen saturation and other vitals, as she was having a severe asthma exacerbation. He became increasingly agitated, so I removed myself from the room and notified my attending physician. Fortunately, we were able to pacify the situation by calling security and having another caregiver come stay with the girl for her admission. My co-intern and I had a few notes to complete at the end of the day, so we stayed behind to finish them together.

At the end of my shift, I was exhausted. As I sat in my car at the red light, I began to mentally list all the "life things" I had been putting off, and everything I was looking forward to doing during my break.

The left turn signal began flashing yellow. I looked ahead, then to my left and right. The coast was clear. I slowly began to turn left. Through my peripheral version, my eye caught a car speeding toward me from my left at what seemed like 50-60 mph. I had no time to process that this person was going to run the red light. "CRASH!"

The Accident

My car spun clockwise from the impact, and my head slammed into my side window. Everything slowed down. I saw the damaged petite gold car that had just hit me speed away as if nothing had happened. I saw the shock on other drivers' faces as they witnessed the horrific scene. I saw my co-intern pull up to the red light two lanes to the right of me, wondering if she could see me. But as the light turned green, she drove away, unknowingly.

There was ringing in my ears, and everything just seemed to pause. Pieces of my car lay scattered throughout the intersection, making loud crunching sounds as other cars drove over them. I looked around in complete disbelief of what had just happened. I had never been in a serious car accident before. My hands shaking and lip quivering, I located my phone and quickly dialed 911. Afterwards, I dialed my sister but sat there in silence despite her saying "Hello?" several times, until a kind woman in a hospital uniform knocked on my passenger window, jolting me back to the present.

"Sweety, are you ok? Here is my name and number. I saw what happened while heading to work and I want you to know I will stay with you as a witness until the cops arrive. Why don't you pull over to the side, away from this busy intersection?"

Slowly beginning to process again, I made a right turn and pulled over, my car smoking and making bizarre sounds. More witnesses began approaching me and advised me to get out of my car for safety. As I began to tell my sister what just happened, a couple approached me. The man informed me that he had chased the gold car down, honking at the driver, but she refused to stop, so his

girlfriend took a picture of the car's license plate as evidence for my case. As I processed the amount of kindness so many strangers were showing me, the tears immediately began flowing and I sat down on the sidewalk to gather myself. A police officer soon arrived and assured me he had enough details for my case. Shortly after, the ambulance arrived and the EMTs evaluated me and rushed me to the Parkland Hospital ER. Coincidentally, it was right across from Children's Hospital ER where I had spent my day shift.

The Aftermath

I am so thankful that my limbs, movement, speech, and vision are all intact. Had I pulled forward just a few feet more, the driver would have directly hit me; instead of removing the entire front of my car, she could have removed my soul from this world. The only visible injury I sustained from the accident was a superficial hematoma on the left side of my head, which self-resolved a few hours after the accident. My head CT was negative for any brain bleeds/fractures and my chest and hip x-rays were also reassuring. My neurological exam was intact, and the only symptoms I had were nausea, a pounding headache, and leg pain, which were all expected. By 3 a.m., I was ready to be discharged home with my brother. The ER physician informed us that I may experience post-concussive symptoms for a while. When my brother asked how long the symptoms could persist, the doctor stated they typically resolve in a few days or a week in most people, but some go on to experience symptoms for months. I remember not giving this a second thought as we headed home.

At first, I felt fine. However, while I was home with nothing to do but relax for the first time in forever, a variety of emotions came over me:
-I felt relief that I was alive, alert, and oriented.
-I felt joy that I was able to sleep in.
-I felt sadness from losing the car because it held sentimental value. My father, my best friend and No. 1 supporter, bravely battled Stage 4 prostate cancer for nine years. When he became very ill, he told me he wanted me to have his car.
-I felt fear when I received a call from the ER a few days later, with recommendations for an MRI because of a lucency over my left femoral head appreciated by the radiologist upon re-reviewing my x-rays. Fortunately, the MRI was reassuring.
-I felt burdened by the piling medical bills, despite having health insurance.
-I felt disappointed that I had never checked what kind of car insurance I had. When my father passed, I took over paying my bill without realizing I had liability insurance, not comprehensive coverage.
-I felt astonished upon discovering that the person who hit my car was a criminal and had spent time in jail.
-I felt anger that this criminal was still free on the streets.
-I felt defeated when a lawyer told me this case was a headache (no pun intended) not worth fighting.
-What I have felt most, though, is frustration with the unpredictability of my clinical course. In order to move past my frustration, the greatest challenge I've had to overcome has been denial. More specifically, denial of self-love and self-care as I began to struggle with the medical issues that resulted from my accident.

It is well known that most people who pursue medicine are Type A personalities. We are experts at delaying gratification. We jump through challenges thrown our way and persevere. Pediatrics is one of the lowest paid specialties, and yet we rank relatively high for career satisfaction. Being there for our patients means so much to us, which is what made it so difficult for me to pause when absolutely necessary. My body was telling me to pause my passion in order to heal, and I didn't know how to.

Fortunately, I had people who genuinely cared about my wellbeing. I remember my family begging me to request more time off to further recover. My chief resident called to check in a week after my accident; I told her I was fine and excited to be back at work soon. However, she took the time to ask me specifically if I was having headaches or other symptoms. She reminded me that my wellbeing was the top priority right now. When I downplayed my symptoms, she utilized evidence-based medicine to guide her recommendation. Unsurprisingly, this strategy convinced me to take an additional week off.

A few days later, I began having insomnia and mild lapses in concentration and memory. By the end of the second week, I was waking up daily with headaches that would

last all day. As my symptoms worsened, I became increasingly worried, but my family and friends continued to provide unyielding support. My chief also continued to provide a listening ear. After several weeks of my symptoms fluctuating between mild and debilitating, I finally felt like I was feeling consistently well. I was able to slowly transition back into residency.

However, about a month and a half later, I again experienced a post-concussive flare, requiring me to take more time off. While it was frustrating, I was able to bounce back two weeks later and continued doing well until another recent flare. While ~90 percent of concussion symptoms typically resolve within two weeks, around 15 percent of mild traumatic brain injury patients will develop post-concussive syndrome, with symptoms persisting past three months (Dikmen et al., 2017; McInnes et al., 2017). I never imagined I would become part of this statistic. While I am still working on finding an optimal medication regimen for my symptoms, I know I am so close to achieving it. Slowly, I am also accepting that these flares may continue to happen occasionally and to prioritize my wellbeing.

Today

Writing this piece was an exercise in vulnerability. I discovered so much about myself while editing numerous rough drafts, and I began to share more of my experience in my writing each time. My accident forced me to slow down my go-go-go personality, and practice self-care. To anyone reading this, I implore you to pause and think about at least one thing you want to do for yourself; not after you have completed medical school, residency, fellowship, etc. Right now. Your wellness is important, and you have to take care of yourself in order to take care of your patients.

Today, the primary emotion I feel is happiness and warmth. My family, friends, colleagues, residency program, and my own team of doctors have all helped me in my recovery and I feel so fortunate that God has placed them in my life. I am eternally thankful for those who check in. I still have some "bad" days spent in bed due to debilitating headaches but the good days greatly outweigh the bad ones. I am hopeful and reassured knowing this is not forever. Until then, rather than trying to get back to who I was, I will instead continue to work on showing myself grace and take things one step at a time, not only for myself but also for my patients.

Signing off:
Fatima Ahmad, MD
Pediatrics, PGY-1
April 18, 2022

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The Intern Account IIa: Ramadan and Medicine

By Fatima Ahmad, PGY1

Introduction

Given that there are over three million Muslims in the United States, it is important for medical professionals to better understand Ramadan as it relates to the health of Muslim patients. In this paper, we will delve into what Ramadan entails, followed by a discussion on the physiology of fasting in Ramadan and how it affects children's health.

What is Ramadan?

Ramadan is a 29-to-30 day endurance marathon for Muslims, consisting of fasting, worship, meditation, and strengthening one's relationship with God. It is the ninth month of the Islamic lunar calendar, and begins and ends with the appearance of the crescent moon.

While Ramadan is known for daily *sawm* (fasting) from dawn until sunset, the underlying goal is to overcome one's *nafs* (self/ego/psyche). In fact, the term *sawm* is derived from a root word meaning "self-restraint". Fasting, one of five pillars of Islam, facilitates detoxification of the body, mind, and soul by helping one avoid worldly distractions such as eating, drinking, smoking, sexual activity, cursing, gossiping, and lying, as these invalidate the fast. This allows time for self-reflection, prayer, charity, service work, and study of the Qur'an. For those unable to fast due to physical/mental illness, pre-pubescence/old age, pregnancy / breastfeeding, menstruation, or necessary travel, fasting is exempt. When Ramadan ends, missed days can be made up by those who are able to fast at a later time or, if impossible (i.e. severely ill), compensated for with *fidya* (financial assistance to the poor in an amount equivalent to two kilograms of wheat per missed day of fasting).[2]

A day in Ramadan begins with *suhoor* (pre-dawn meal), followed by the first of five daily *salat* (obligatory prayers), called *Fajr*, *Dhuhr*, *Asr*, *Maghrib*, and *Isha*. At sunset, Muslims have *iftar* (evening meal to break their fast). The goal is to seek moderation and balance, as overindulging takes away from the experience of understanding how people in poverty live. However, many Muslim households still have lavish feasts with numerous fried foods and sweets.

About an hour after *iftar* and *Maghrib*, Muslims perform *Isha* prayer, followed by *taraweeh*, an optional set of prayers consisting of eight or twenty *rakats* (a series of movements, including standing, bowing down, and prostrating during the prayers). *Taraweeh* means to rest and relax, as it is a lengthy prayer with breaks for mini-lectures after every four or eight *rakats*. During these breaks, Muslims sit down and relax for ten to fifteen minutes. The prayer is lengthy because, at most *masjids* (mosques), the *Imam* (person leading the prayer) recites all 114 chapters of the Qurʾān within the month of Ramadan. While all daily prayers may be prayed in congregation at the *masjid* all year long, millions of Muslims worldwide make an extra effort during Ramadan to attend the *masjid* for *Isha* and *taraweeh*.

Ramadan concludes with the celebration of *Eid al-Fitr* ("festival of breaking the fast"). After the congregational morning prayer, there are festivities, carnivals, family/friend gatherings, exchanging of gifts and goodies, and of course – food. While Eid is a time of celebration, many are saddened to see Ramadan end, because they worked hard to build good habits and break bad habits. They are aware that it will be challenging to maintain the new and improved version of themselves once they are thrown back into "regular" life.

Fasting, from a medical perspective

The *Journal of Fasting & Health* highlights adverse effects and benefits of fasting in Ramadan. For example, fasting for ten to twenty-one hours in Ramadan (depending on geographic location) can be associated with side effects such as heartburn, dehydration, headaches, bowel irregularities, anemia, sleep disturbances, and overall mental and physical exhaustion.[10] Therefore, preventive measures are prescribed to fasting Muslims including aiming to consume balanced meals consisting of fruits and vegetables between the breaking of the fast (*iftar*) and pre-

fasting meal (*suhoor*) as well as staying hydrated, avoiding sugary or fried foods, restraining from overindulging all at once during *iftar*, and prioritizing rest whenever possible.

Fasting in Ramadan is comparable to intermittent fasting (IF), categorized into alternate-day fasting (ADF) and time-restricted feeding (TRF). In ADF, one fasts for 24 hours, somewhat similar to fasting in Ramadan for 12 to 18 hours. However, in ADF, each fast is followed by eating for a 24 hour period. TRF involves consuming an entire day's worth of calories in about eight hours and fasting for the remaining 16 hours of the day, which is more similar to Ramadan fasting in which Muslims can eat in the almost eight hours between *iftar* and *suhoor*.[10]

Health benefits of fasting include improved metabolism, weight management, obesity and diabetes prevention, cardio- and neuroprotection, cancer prevention, as well as anti-inflammatory and anti-aging effects. Intermittent fasting (ADF, TRF, and Ramadan fasting) improves insulin sensitivity through the reduction of fasting glucose and insulin, reduction of triglyceride levels,[4] as well as increase in high-density lipoprotein ("good cholesterol") and adiponectin.[5,9] Adiponectin, which typically functions to regulate food intake/use of energy stores, is low in obese patients. In several studies, Ramadan fasting was shown to decrease body weight, waist and hip circumferences, and BMI. Therefore, by inducing weight loss, Ramadan fasting can increase levels of adiponectin. Additional causes of weight loss secondary to Islamic IF include "reduced energy intake, reduction of total body fluids, and changes in the serum levels of leptin, insulin, and cortisol due to altered sleeping patterns and daily energy consumption.[3,6,10] Patients with obesity have increased levels of leptin with leptin resistance, which is associated with further "obesity, insulin resistance, hypertension, hyperlipidemia, inflammation, atherosclerosis, ischemic heart disease, and heart failure." Because of its numerous benefits to metabolism and weight, intermittent fasting may help with prevention of metabolic syndrome, which is characterized by "insulin resistance, obesity, hyperglycemia, hypertension, hypertriglyceridemia, and decreased high-density lipoprotein."[10]

In addition, Ramadan fasting is associated with improvement of cardiovascular risk factors such as decreasing low density lipoprotein and very low-density lipoprotein cholesterol ("bad cholesterol"), as well as indirectly protecting the heart from ischemic injury through changes in adiponectin levels, thus decreasing myocardial inflammation and apoptosis. In those who consistently follow IF, there can be a reduction in the risk of coronary heart disease. Studies on intermittent fasting in experimental rat models have also demonstrated a reduction in resting heart rate and systolic and diastolic blood pressures.[10]

IF can also assist in neuroprotection by increasing levels of antioxidants and brain-derived neurotrophic factor (BDNF), which improves cognition, control of food intake, and energy expenditure. Fasting also helps suppress inflammatory processes by reducing production of proinflammatory cytokines such as IL-6, IL-1β, and TNF-α.[10]

Ramadan fasting additionally reduces DNA damage by decreasing levels of insulin-like growth factor-1 (IGF-1), insulin, and glucose, and therefore protects from abnormal cellular growth and assists in appropriate apoptosis of these abnormal cells. In a mouse model, prolonged nightly fasting was associated with reduction in the risk of breast cancer recurrence likely secondary to improved glucoregulation and sleep patterns. With all of the benefits mentioned above to various organ systems of the body, IF indirectly improves overall lifespan by protecting and improving bodily functions in addition to directly activating anti-aging pathways by downregulating insulin, insulin-like growth factor (IGF-1) and mTOR pathways.[10]

Fasting and Pediatrics

While prepubescent children are not Islamically required to fast, many of them excitedly attempt to, making this a topic pediatricians should be familiar with. Interestingly, there is a scarcity of scholarly literature on the effects of Ramadan fasting in pediatric populations.

One paper discusses how lower glycogen stores and higher metabolic rates in children compared to adults place them at risk of more rapidly developing

dehydration, hypoglycemia, and ketoacidosis (even in those without underlying endocrine issues) with an inverse relationship to age. A prospective cohort study in Qatar on pre-teen/teenage Muslim males fasting in Ramadan found a significant increase in fat and protein intake during Ramadan, while preteenagers specifically had a reduction in body fat percentage, hemoglobin, and serum iron. There were mixed neurobehavioral effects, with preteens having worse performance in match-to-sample test, while overall study participants reported "significant improvement in spatial planning, working memory tasks, and working memory capacity test scores."[8]

Additionally, in June 2016, a cross-sectional study surveyed fasting vs. non-fasting adolescents at the Hacettepe University Hospital's Division of Adolescent Medicine in Ankara, Turkey to better understand their motives for fasting in Ramadan and whether they correlated with disordered eating behaviors or were a risk factor for eating disorders. The study utilized 24-hour dietary recall to assess nutritional status, the Eating Attitudes Test-26 (EAT-26) and Three Factor Eating Questionnaire-R18 (TFEQ-R18) to assess the risk of disordered eating, and the Stunkard's Figure Rating Scale (FRS) for patients to rate their level of body dissatisfaction. The fasting and non-fasting patients did not have a statistically significant difference in energy and macronutrient intake during Ramadan. The study showed that Ramadan fasting was not associated with a decrease in daily caloric intake, nor was it correlated with disordered eating behaviors or body image dissatisfaction; however, total daily intake for fasting and non-fasting adolescents was lower than recommended for age and gender, likely due to decreased number of meals taken in a fasting day or underreporting since only a 24-hour dietary recall was taken. Additionally, EAT-26 and TFEQ-R18 scores lacked significant statistical difference, with the exception of emotional eating scores elevated in fasting adolescents (in those who had pathological scores for bulimia). "202 (97.5%) adolescents reported fasting for religious purposes whereas only eight (3.4%) for losing weight. The EAT-26 total scores were in the pathological range in 39 (16.8%) adolescents who fasted for religious purposes." Overall, the study suggests that the underlying motivation for fasting in these Turkish adolescents during Ramadan 2016 was more for spiritual purposes than weight control/caloric restriction/emotional factors. However, because this study was conducted in a predominantly Muslim country, it would be interesting to conduct the study in other countries such as the United States.[1]

With this foundational understanding of Ramadan and the physiology of fasting to better address patient needs, we will now shift to better understand how Ramadan affects medical professionals during residency and how programs can address their unique needs during Ramadan. Stay tuned for Intern Account IIb: Ramadan, Residency, and Rejuvenation…!

Signing off:
Fatima Ahmad, MD
Pediatrics, PGY-1
May 06, 2022
Shawwal 05, 1443

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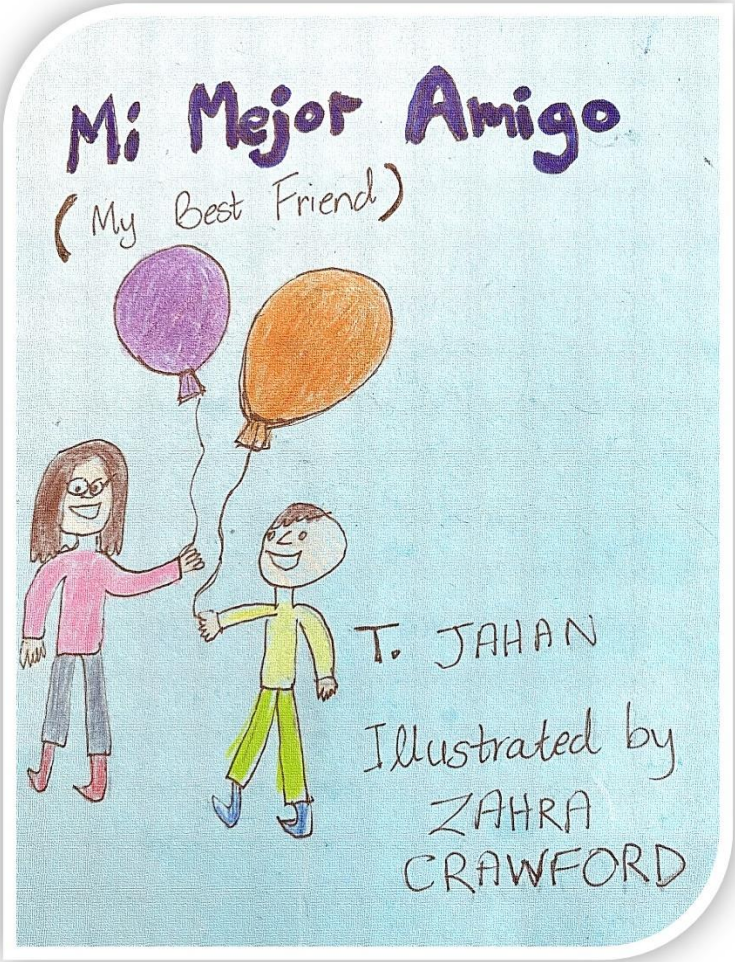
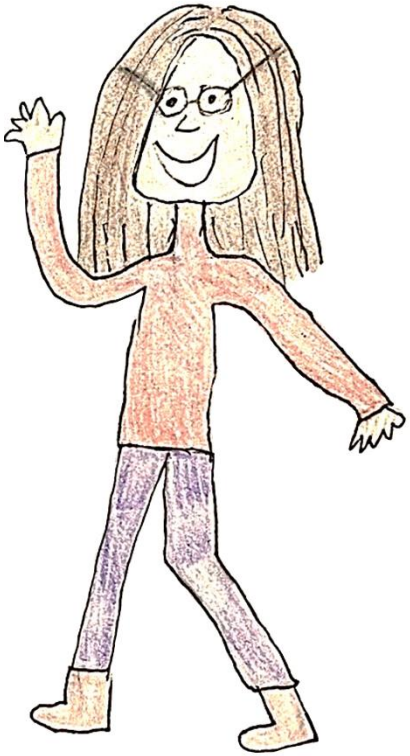
Mi Mejor Amigo (My Best Friend)

Authors: Tahmina (Eva) Jahan PGY2, José Marcelino Vargas CMC Interpreter
Illustrator: Zahra Crawford





¡Hola! ¡Soy Zahra!

(Hi! I'm Zahra!)

Este es mi hermanito. Su nombre es Taye Taye.

(This is my little brother. His name is Taye Taye.)

¡Nosotros hacemos todo juntos!

(We do everything together!)

Nosotros vamos al parque juntos.

(We go to the park together.)

Jugamos juntos con muñecos.

(We play with dolls together.)

Pintamos juntos.

(We paint together.)

Construimos fuertes.

(We build forts.)

Me gusta leerle.

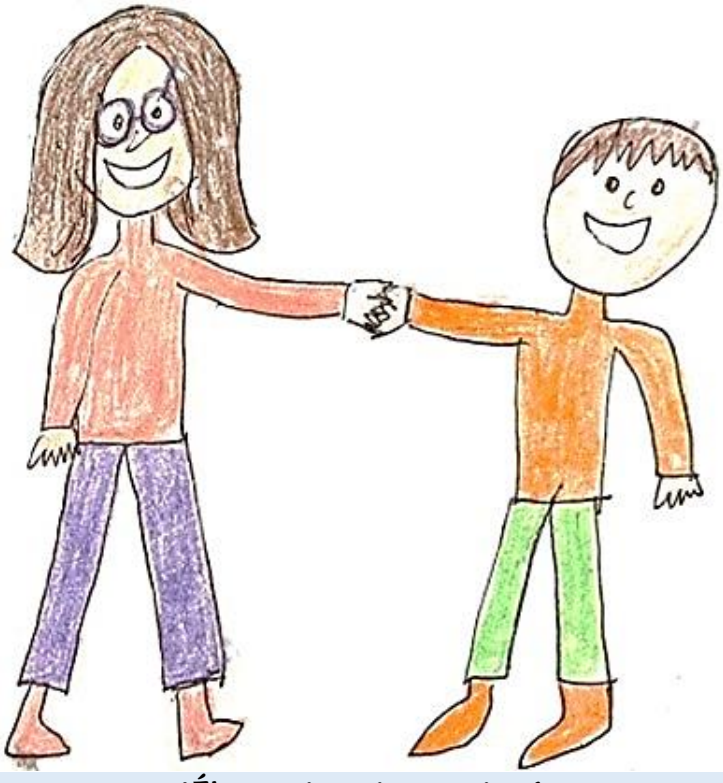
(I like to read to him.)

A veces peleamos, pero siempre nos reconciliamos.

(Sometimes we fight, but we always make up.)

Cuando estoy triste, eí me hace reir.

(When I'm sad, he makes me laugh.)

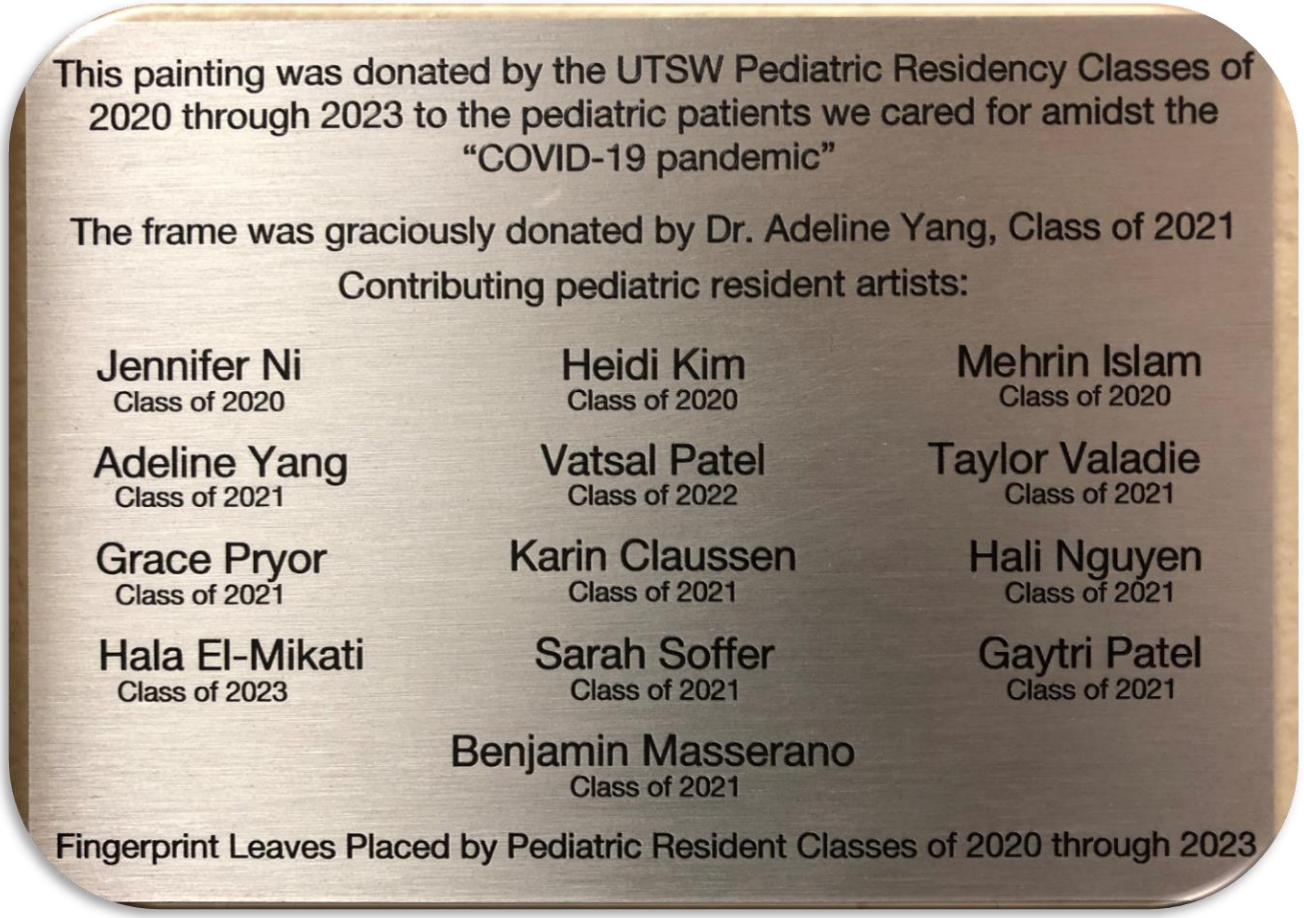


¡Él es mi mejor amigo!

(He is my best friend!)

El fin

(The End)



Plaque donated by Cat Bailey

Both the painting and plaque currently reside in the Level L hallway for all patients and staff to enjoy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