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PROGRAM WITH ABSTRACTS

WRIGHT STATE UNIVERSITY
BOONSHOFT SCHOOL OF MEDICINE

FIRST ANNUAL RESEARCH SYMPOSIUM

April 6, 2022

4:30 – 7:00 p.m.

Student Union: Apollo,
Atlantis, and Endeavor Rooms

Program

4:00 p.m.	Poster Setup & Registration
4:30 p.m.	Dr. Valerie Weber Welcome
4:40 p.m.	Student Grant Awardees
5:05 p.m.	Faculty Research Talks
6:15 p.m.	Poster Session & Refreshments

Featured Student Research Talks

Christopher Dupont, B.A., MS3

Understanding Muscle Weakness in Hyperkalemic Periodic Paralysis

Chris Dupont is a third medical student at the Boonshoft School of Medicine. Chris grew up in Quebec, a French-speaking province of Canada, and later moved to Europe to pursue a professional soccer career. Throughout his soccer career, he suffered from many muscle injuries which led to his interest in studying muscle physiology. As a physics undergraduate at Wright State University, he started doing research in Dr. Mark Rich's lab, where he applied his physics degree to study the electrical properties of diseased skeletal muscle. After a few months in Dr. Rich's lab, he quickly realized the power of medical research. It inspired him to pursue a career as a physician-scientist with the goals of helping others and engaging in breakthrough discoveries.

Scout Bowman-Gibson, B.S., MS2/G1

Isolation and Application of Extracellular Vesicles

Scout Bowman-Gibson is an MD-PhD student in her first year of graduate study with the Biomedical Sciences PhD program at Wright State University. Scout is originally from Cincinnati, Ohio and attended Ohio State University for undergraduate studies. While in her first year of medical school at Boonshoft School of Medicine, she began conducting research in Dr. Thomas L. Brown's lab. Scout's interests in disease pathophysiology and diagnostic technology has led her to continue her education and development as a physician-scientist.

Featured Student Research Talks

Tonia Rhone, M.S., MS3

Patient-Centered Focus Groups as a Catalyst for Anti-Racism Research and Quality Improvement in an Urban Academic OB/GYN Clinic

Tonia Rhone is a third-year MD student at Wright State University Boonshoft School of Medicine. She was born and raised in Edmond, OK. Tonia attended Baylor University in Waco, Texas and earned her BS.Ed in Health Science Studies. Choosing a non-traditional path to medicine, she attended Case Western Reserve University in Cleveland, Ohio and earned a master's degree in Medical Physiology before applying to medical school in 2019. Tonia spent her gap years also working as a Clinical Research Coordinator and Assistant at the Harrington Heart & Vascular Institute at University Hospitals in Cleveland, OH. Her role in research focused on evaluating novel multidisciplinary care interventions and barriers to implementation in interventional cardiology. This experience further ignited a passion for combating racially disparate outcomes in medicine, with a specific interest in improving existing institutional practices and developing new interventions. Recognizing the need for this work in maternal healthcare and as an aspiring OBGYN, Tonia is committed to being at the forefront of advocacy and translational research in the field. Tonia also currently serves as a part of the Black Maternal Health Leadership Team at Tufts University School of Medicine, led by her mentor Dr. Ndidiamaka Amutah-Onukagha.

Featured Faculty Research Talks

Timothy Crawford, Ph.D., M.P.H.

Exploring the Impact of Discrimination and HIV-related Stigma on Engagement in HIV Care: Findings from a Pilot Study among Older African Americans Living with HIV

Dr. Timothy N. Crawford is an epidemiologist and biostatistician in the departments of population and public health sciences and family medicine. His research focuses on the intersection of HIV, race, and age. He is specifically interested in understanding how HIV-related stigma, racism, sexism, ageism, and heterosexism intersect to affect HIV care outcomes among older African Americans living with HIV.

Jason Miner, M.D.

Defining Mild Traumatic Brain Injury: Making the Leap from Research Definition to Clinical Practice

Jason Miner MD, Major USAF is a trauma and acute care surgeon for the United States Air Force with an imbedded faculty position at Wright State University and Miami Valley Hospital, a Level I trauma center in Dayton, OH. He was born in Tulsa, OK and received his undergraduate degree in Biomedical Zoology from the University of Oklahoma prior to matriculating to medical school at the University of Oklahoma College of Medicine. Dr. Miner completed his residency in General Surgery at Wright State University in Dayton, as well as, a two year fellowship in Surgical Critical Care and Acute Care Surgery. He enlisted in the United States Air Force in 2005, and served as an intelligence analyst for the 135th Fighter Wing of the Oklahoma Air National Guard prior to his medical training. In this capacity, he deployed in service of Operation Iraqi Freedom in 2008. Upon entering medical school, he transitioned to active duty where he continues to serve, and recently completed a deployment to Niger, Africa as a part of a six person forward surgical team supporting the Army Special Forces. Dr. Miner is a member of the American Medical Association, the American College of Surgeons, the Excelsior Surgical Society, and became an Associate member of the American Association for the Surgery of Trauma in the inaugural class of 2019.

Featured Faculty Research Talks

Sydney Silverstein, Ph.D. & Danielle Gainer, M.D.

Rethinking Trauma-Informed Care: How Qualitative Research Can Inform Clinical Practice

Dr. Sydney Silverstein is an Assistant Professor at the Center for Interventions, Treatment, and Addictions Research (CITAR) and the Department of Population & Public Health Sciences. Trained as an anthropologist, she has conducted mixed-methods research on illicit drugs and drug use for over eight years, in both Peru and the United States. She has published numerous qualitative studies analyzing the experiences of people who use drugs, their attempts at self-treatment and self-management of their substance use, and their attempts at recovery. She has also developed innovative ways to use participatory visual methods, such as photography and film, in her research. Currently, she is a Co-PI on several studies, including a mixed-methods study of methamphetamine use, a mixed-methods study of the utility and efficacy of Ohio's 911 Good Samaritan Law and a study, along with Dr. Gainer, examining the experiences of people who have survived a recent, non-fatal overdose. She is also a member of the Community Overdose Action Team (COAT) through PHDMC.

Dr. Gainer is an Assistant Professor and Director of the Research Division in the WSU Department of Psychiatry, and an affiliate of the Center for Interventions, Treatment, and Addictions Research. She is Board Certified in Psychiatry and Addiction Medicine and actively practices medicine in multiple settings around the Dayton area. She has conducted research projects related to opioid use disorder focusing on psychiatric co-morbidities in OUD and factors related to SUD treatment retention. She is currently a Co-PI on a study examining people's experience of non-fatal overdose and subsequent care trajectories.

Kwang-Jin Cho, Ph.D.

K-Ras plasma membrane interactions: a tractable therapeutic target

Dr. Kwang-jin Cho completed his Ph.D. in Molecular Cell Biology at the University of Queensland, Australia in 2009. He then moved to the University of Texas Health Science Center at Houston, Texas for his postdoctoral fellowship. In October, 2016, he joined the Department of Biochemistry and Molecular Biology at Wright State University.

Poster Session & Reception

Student Union Apollo Room

6:15 – 7:00 p.m.

On the following pages you will find information regarding the poster presentations for this evening's symposium. The poster number corresponds to the location of the poster. All departments are associated with Wright State University or the Boonshoft School of Medicine unless otherwise noted.

Poster: 1

Keavash Assani

The Effect of the COVID-19 Pandemic on the Stage of Presentation of Common Cancers at a Community Hospital

Mentor: *Priti Parikh, Ph.D.*

Department: Surgery

Abstract: Introduction: COVID-19 has affected all aspects of healthcare, including cancer screening. Objective: Evaluate the effect of COVID-19 on the stage of presentation of common cancers. Methods: Retrospective chart review of cancer registry 2019-2021 for cancers: Esophageal, Breast, Lung, Pancreatic, Gastric, Colorectal Compared pre/post COVID screening restrictions for population statistics and stage of presentation Results 2967 total patients 1920 patients met criteria (65%) 1271 pre-COVID-19, 649 post-COVID-19. Decrease in Stage III Pancreatic Cancer (Table 1). Decrease in proportion of lung cancers and Increase in proportion of colorectal cancers being diagnosed (Table 2). Conclusion: COVID-19 could have lasting effect on preventable cancer deaths, but not seen at this time interval. Observed decrease in cancers, where are the others? Repeat studies to track this concern over time.

Poster: 2

Molly Balcer

The Role of Complement in the Pathogenesis of Myasthenia Gravis and Neuromyelitis Optica

Mentor: *Tracy J Eicher, M.D. and Adam Deardorff, M.D., Ph.D.*

Department: Neurology

Abstract: Introduction: Myasthenia Gravis (MG) and Neuromyelitis Optica (NMO) are two distinct autoimmune disorders affecting the peripheral and central nervous system, respectively. The target of the humoral immune response in MG is the acetylcholine receptor (AChR) located at the neuromuscular junction (NMJ) or AChR associated proteins, muscle-specific kinase (MuSK) and lipoprotein receptor-related protein 4 (LRP4). In NMO, the target is aquaporin 4 (AQP4) located on astrocytes diffusely throughout the central nervous system (CNS), or less commonly, myelin oligodendrocyte glycoprotein (MOG). Despite the relative rarity of the diseases and disparate immunological targets, the co-occurrence of both disorders in the same patient is well documented with a prevalence anywhere from 11.9-14.6%. However, there is a paucity of data supporting evidence-based management strategies for patients with overlapping MG and NMO. Case: In this case report, we present a patient with both MG and NMO. In this individual, both disease processes were successfully treated with Eculizumab. The patient achieved remission of both disease processes and has shown remarkable functional and radiographic improvement. Discussion: In both MG and NMO, IgG binding to AChR or AQP4 results in the fulminant activation of the classical complement pathway that results in the formation of the membrane attack complex (MAC). In NMO, this complex is implicated in the destruction of astrocytes and resultant demyelination, whereas in MG, the MAC complex is thought to destabilize AChR clusters on the NMJ postsynaptic membrane. The role of complement in the pathogenesis of both diseases has led to recognition of a reasonable target for their treatment: the complement proteins themselves. Eculizumab is a monoclonal antibody with high affinity for the C5 complement protein that renders it unable to be cleaved for formation of the MAC. This case demonstrates the critical role of the complement cascade in both MG and NMO disease pathogenesis and the efficacy of complement inhibition in their combined management.

Poster: 3

Jesse Cannella

Providing Gender-Affirming Care for Transgender Patients

Mentor: *Nita Bhatt, M.D., M.P.H.*

Department: Psychiatry

Abstract: Joshua H, a 16 year-old transgender male, using he/him/his pronouns, with no known past psychiatric history, presented to the children's hospital for intentional Tylenol overdose. The patient was initially admitted to the hospital pediatrics service for medical stabilization. Inpatient psychiatry was consulted, but deferred treatment until medical clearance. The patient presented with severe 10/10 abdominal pain, somnolence, and nonbilious emesis. Liver functions and INR were found to be elevated. Metabolic panel and CBC were otherwise within normal limits, and the patient was promptly treated with N-acetylcysteine. By hospital day two, the patient's alertness and orientation were significantly improved, with a quiet but pleasant affect and appropriate mood. The patient admitted to depression for the past two years, with two suicide attempts. Inpatient PHQ-9 was found to be 29. Joshua reported an affirming and supportive household, but consistent bullying and misgendering at school. Joshua reported that his peers and teachers refuse to use his preferred name and continue to refer to him as "a girl", harassing him every time that he uses female restrooms or locker rooms. Joshua has never followed with a psychiatrist and has not received gender-affirming treatment, but desires hormone therapy. While inpatient, Joshua's senior resident was adamant to use Joshua's preferred name and to consistently use appropriately male pronouns regarding Joshua, and to consistently present Joshua as a "16 year-old male"; the senior resident insisted that the rest of her medical team likewise refer to Joshua using these terms. The children's hospital used a standard electronic medical record system, which allowed for SOGIE (sexual orientation, gender identity, gender expression) data to be put into patients' charts, but did not allow providers or staff to change patients' names or genders. The senior resident and medical team were thus intentional about using accurate pronouns and Joshua's preferred name in all of his notes, as well as on a "post-it" in his chart. None the less, when running the list at the end of the day, the senior resident incorrectly named Joshua as "Allison" and misgendered him when going through his information. Despite the team's best efforts, this was still the name and sex automatically printed from the patient list and chart. This case study presents a common barrier to affirmative care for transgender patients, expressed by the limits in the electronic medical record system. Transgender patients, who face significant disparities in depression, anxiety, and suicide, as well as frequently gender dysphoria, are extremely vulnerable to mistreatment within the medical community, including microaggressions of misgendering and incorrect name use, as well as frank harassment and abuse. Effective gender-affirming care thus necessitates a conscious effort by providers and medical staff of all specialties, with recognition of their shortcomings.

Poster: 4

Maria Rechtin

False Negative: a case report on disseminated histoplasmosis in the setting of a negative urine antigen test

Mentor: *Luke McCoy, M.D.*

Department: Internal Medicine

Abstract: Background: Histoplasmosis is a rare invasive fungal infection that can occur in immunocompromised patients. In solid organ transplant patients histoplasmosis usually presents in the first two years post-transplant, but can present at any time. Fever, diarrhea, and weight loss are the most common chief complaints. Case: A 41-year-old male twelve years status post cadaveric renal transplant presented to the ED with a one-month history of abdominal pain, diarrhea, and unintentional weight loss. Home medications included tacrolimus, mycophenolic acid, and prednisone. Initial workup showed leukopenia and anemia, pre-renal kidney injury,

respiratory acidosis, and a normal lactate. During the first 5 days of hospitalization he underwent extensive serum, stool, and urinary microbiology testing, including a histoplasma urine antigen test. All tests were all negative except for an elevated (1→3)-β-D-glucan (Fungitell ®). CT and PET CT of the chest, abdomen, and pelvis revealed extensive bilateral hypermetabolic pulmonary infiltrates. Renal transplant ultrasound was negative for hydronephrosis. Nephrology, gastroenterology, infectious disease, and pulmonology were consulted during this time, and he had a negative renal biopsy, EGD, and colonoscopy. The patient declined bronchoscopy. Empiric dapsone and pyrimethamine were started for possible PJP while awaiting complete microbiology results. At one week, his course became more tenuous with increasing oxygen requirements. These initially improved with corticosteroids, but ultimately he required intubation and vasopressor support on day 10. No pathogen had yet been identified and BAL was negative for PJP so antibiotic coverage was widened to cefepime and he was started on hydrocortisone. Chest x-ray showed worsening bilateral diffuse patchy infiltrates. Echocardiogram showed severe left ventricular hypertrophy with a normal ejection fraction. Though pressors were initially weaned and he was able to be extubated, he soon required repeat intubation. Pulmonary infiltrates continued to worsen, he went into atrial fibrillation with rapid ventricular response, and had labile blood pressures treated with diuretics, an esmolol drip, and intermittent phenylephrine, respectfully. On day 14, he was started on CRRT for severe symptomatic hyperkalemia. He also developed acute thrombocytopenia and hematology was consulted. Repeat microbiology testing found that the serum histoplasma antigen was elevated. He was immediately started on amphotericin B. He continued to decline, however, and on day 15 he was determined to be brain dead and supportive measure were discontinued. Autopsy revealed disseminated histoplasmosis involving the bilateral lung, liver, heart, pericardium, and central nervous system. Discussion: Prompt diagnosis and treatment essential in histoplasmosis. Diagnosis made with antigen testing. Urine antigen PCR testing has a 93% sensitivity while serum antigen testing has an 86% sensitivity. Serum antigen tests may be positive when urine antigen testing is negative. In this case, a diagnosis of disseminated histoplasmosis and subsequent treatment with amphotericin B was delayed because of an initial negative urine antigen screen.

Poster: 5

Kelly Spiller and Olatunde Bashorun

The Last Resort: Proximal-Based Sural Artery Cross Leg Flap with Long Term Follow-Up, A Case Report

Mentor: *R. Michael Johnson, M.D.*

Department: Orthopedic and Plastic Surgery

Abstract: Case: Two cases of Gustilo type III-B and III-C fractures were salvaged with multi-staged cross leg flap using a proximal-based sural artery flap. No major complications were encountered, with successful flap inset, division, and donor site closure. Both patients remain active, each ambulating on the salvaged extremity maintaining stable soft tissue coverage at 2 and 4 years post-operative. Conclusion: Proximal-based sural artery cross leg flaps are an effective, reproducible, and successful reconstructive modality to employ for complex traumatic lower extremity salvage.

Poster: 6

Caroline Wong, Sarah Yu, and Monica George

A Clinically Isolated Syndrome of Cranial Nerve III Palsy

Mentor: *Ajay Goenka, M.D.*

Department: Neurology

Abstract: Objective: Assess the rare presentation of a clinically isolated syndrome of cranial nerve III palsy in a pediatric patient. Methods: We present the case of a 12-year-old boy with acute onset double vision with left eye pain, left-sided ptosis, and left ophthalmoplegia. The patient had no other systemic or neurological

symptoms. Results: An extensive work up including serum and CSF studies for autoimmune, infective, or malignant etiologies was performed. MRI Brain showed mild enlargement and enhancement of the cisternal segment of the left CN III. Rest of the work up was negative for any secondary etiologies. The patient was treated with high dose methyl prednisone 250 mg IV every 6 hrs. for 5 days and followed by 2 weeks of oral prednisone. At 3 weeks of follow up clinical visit, there was complete resolution of the symptoms. Conclusion: In rare instances, clinically isolated syndrome can present as cranial nerve III palsy in a pediatric patient.
Keywords: cranial nerve III palsy, clinically isolated syndrome, pediatric patient

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Poster: 7
Sarah Yu and Trang Nguyen
Management of a Mangled Thumb and Index Finger: Pearls for a Successful Outcome
Mentor: *Sunishka Wimalawansa, M.D., M.B.A. and Spencer Anderson, M.D.*
Department: Plastic Surgery
Abstract: Management of a Mangled Thumb and Index Finger with Post-operative Outcome Abstract Background: Mangled hand injuries are complex and challenging cases, and can result in a poor functional outcome or pending degree of injury, requiring amputation. The purpose of this paper is to present a complicated mangled thumb and index finger case, elaborating on the assessment, intraoperative details, and long-term follow-up highlighting management pearls for a successful reconstructive and functional outcome. Methods: Retrospective chart review was performed on a single patient where operative care was performed at Miami Valley Hospital, Dayton, OH and post-operative management performed at Advanced Hand and Plastic Surgery, Kettering, OH. Case: A 60-year-old male patient presented to the emergency room with a traumatic thumb and index finger injury secondary to a table saw. The patient underwent a multi-staged operative approach to digital salvage and reconstruction. Following 44 weeks of dedicated occupational therapy, the patient regained light functional use of his hand in activities of daily living and coordination with marked improvement. Conclusion: Mangled hand injuries involving the thumb are complex and challenging cases. This case highlights the critical link between surgery and therapy, as successful reconstruction and functional outcome is reliant upon a multi-staged operative approach closely associated with consistent and aggressive hand therapy involvement.

Poster: 8
Sarah Yu and Monica George
Hashimoto Encephalopathy: Assessing the markers for recurrence in the pediatric population
Mentor: *Ajay Goenka, M.D.*
Department: Neurology
Abstract: Objective: To identify biomarkers associated with relapse in pediatric patients with Hashimoto Encephalopathy (HE). Methods: A long term retrospective and prospective analysis of 9 patients (median age 13, range 7-12 years) diagnosed with HE. Patients were diagnosed based on their clinical, EEG, laboratory, and MRI brain characteristics at the time of presentation. The patients were followed closely for relapse of symptoms over 18 months. Results: All nine HE patients were female and presented with high levels of anti-thyroid peroxidase antibodies at onset (median 800, range 650 to > 1000 IU/ml). Initial manifestations were neurological (e.g. seizures) in eight patients, and psychiatric (e.g. altered mental status) in five patients. Two patients presented with status epilepticus. EEG had focal slowing in four patients and epileptiform discharges in three patients. MRI was abnormal in four patients. Anti-thyroid peroxidase (TPO) antibodies were elevated in all the patients (median, range 650 to > 1000 IU/ml). The patients were assessed every 3 months over an 18-month duration. Three patients had relapse of symptoms between 3 to 6 months of initial onset of symptoms,

and two of these patients had a second relapse after 12 months. All patients who relapsed had abnormal MRI and abnormal EEG findings at the time of initial presentation. In addition, the two patients with a second relapse presented with status epilepticus at the initial presentation. Conclusion: Status epilepticus as the presenting symptom in pediatric HE patients carries an increased risk of multiple relapses.

Poster: 9

Maria Anderson

Examining Opioid Prescribing Differences Among Male and Female Clinicians Pre and Post PRESTO Training

Mentor: *Paul Hershberger, Ph.D.; c. and Angie Castle, M.A.*

Department: Family Medicine

Abstract: Objective: This research study examined opioid prescribing differences between male and female clinicians before and after training in the PRESTO approach. PRESTO (Promoting Engagement for Safe Tapering of Opioids) utilizes motivational interviewing to assist patients on chronic opioid therapy with tapering their dose to a lower, less risky dose. One variable that may impact the effectiveness of motivational interviewing in the setting of tapering opioids includes gender of the provider. This study analyzed average opioid prescription (Rx) counts per patient and the percent of patients with ORS (overdose risk score) of 0-199 by provider gender. Methods: Data were collected from 54 male and 93 female clinicians for 8 months prior to PRESTO training and 8 months after PRESTO training for a total of 16 months. Welch two sample t-tests were used to compare differences in opioid Rx counts per opioid patients and percent of patients with ORS of 0-199 between male and female providers at pre and post intervention months. Linear mixed effects models (LMEM) examined changes in the respective outcomes over time and by gender. Each model included time, gender, and a time by gender interaction. Results: At pre-intervention, male providers had a higher average opioid prescription count per opioid patient (1.18 versus 1.10, p<.0001) and a lower mean percentage of patients in the ORS 0-199 category (40.63% versus 45.1%, p=.001) compared to female providers. Similarly, male providers had a higher average opioid Rx count per opioid patient (1.15 versus 1.10, p=.01) compared to female providers at post PRESTO intervention. Among male providers, there was a slight decrease in the average opioid Rx per opioid provider from pre- to post-intervention (1.18 versus 1.15), while female providers remained the same (1.1 versus 1.1). Additionally, after the PRESTO training, male providers had a 3% increase in patients with an ORS 0-199, while female providers had a 0.6% decrease. In the LMEM, there were significant gender by month interactions for Opioid Rx count per opioid patient (parameter estimate = -0.0053; standard error = 0.002; p = .02) and percent of patients with an ORS 0 -199 (parameter estimate = 0.29; standard error = 0.14; p = .04). This suggests that males, compared to females, saw a decrease in opioid Rx count per patient and an increase in percent of patients with an ORS 0 -199 over the 16-month study period. Conclusions: The increase in patients in the lowest ORS category may be related to the PRESTO intervention and tapering of patients from higher to lower categories, although other factors are possible. There was no significant change in prescribing trends among female providers after PRESTO intervention in either category, while male providers saw changes in our respective outcomes over time. Further evaluation and examination of possible confounding factors that may be limiting providers' abilities to help patients taper their doses is needed.

Poster: 10

Maneesh Chidambaram

Intra-anal Botulinum Toxin Injection And Dilation: Outcomes For Children And Adolescents With Constipation

Mentor: *Neha Santucci, M.D.*

Department: Gastroenterology

Abstract: Background: Constipation is a common problem, accounting for up to 25% of referrals to pediatric gastroenterologists worldwide. Approximately 95% of childhood constipation is functional in nature, making functional constipation (FC) the most prevalent functional gastrointestinal disorder in toddlers and children. Current treatment of FC is successful in 50-60% of children after 1 year. Botulinum toxin A (Botox), a neurotoxin that inhibits the release of acetylcholine into the synaptic cleft leading to localized reduction in muscle contractility, has been studied for anal fissures in children and adults, but there is little pediatric data for use in functional constipation. At CCHMC, we use intra-anal botox injection of 25 units each in 4 quadrants of the anal sphincter followed by manual dilation, and have anecdotally seen success in patients with chronic constipation. AIM: The aim was to retrospectively assess short term response rates to intra-anal botox injection and dilation in comparison with a control group who instead received standard of care treatment. We hypothesized that this intervention would lead to symptomatic improvement in children and adolescents with constipation. Methods: We reviewed the CCHMC EMR database to gather demographic data, diagnoses, contrast enema, anorectal, and colonic manometry results, and post procedure follow up (within 12 months) in patients who have undergone intra-anal botox injection and dilation. We included patients with clinical diagnosis of constipation. Control group were results of contrast enema, anorectal manometry, and colonic manometry. Complete symptomatic response to botox and dilation was identified as having >3 bowel movements into the toilet and no episodes of fecal incontinence per week. To eliminate as much confounding effect as possible, we applied the propensity score matching method to pair botox treated patients with non-treated patients. Given limited information, we were able to match based on Age group, Gender, Fecal incontinence, and Bahavioral issues. Results: 175 patients received medical management alone and 93 underwent intra-anal botox injection and dilation. After a 10% propensity caliper matching, we included 80 patients in each group. After matching, 48% of cases and 51% of controls were males. Cases had worse dilated rectosigmoid colon than controls (33% vs 9%, p=0.012). Among cases, complete response was noted in 22.5%, partial response in 47.5% and no response in 30% of patients. Among controls, complete response was noted in 33.8%, partial response in 38.8% and no response in 27.4% of patients. Thus, the overall response rates were 70% for cases compared to 74.6% for controls (p=0.273). Conclusion: Combined intra-anal botox injection and dilation was associated with some improvement in symptoms in many patients in this small cohort but was comparable to standard of care treatment. This may be due in part to the fact that those undergoing botox injection tended to have more severe disease prior to therapy based on severity of available water soluble contrast enema. A limitation of this study is that the patients were not matched based on severity of disease, and this should be a consideration going forward. Another limitation is recall bias during follow up visits and inconsistent documentation during chart review. Prospective clinical trials are also required to assess efficacy of these treatments in children and adolescents with constipation.

Poster: 11

Timothy Frommeyer

Assessment of Patient Perceptions of Technology and the Use of Machine-Based Learning in a Clinical Encounter

Mentor: *Ean Bett, M.D.*

Department: Grant Family Medicine Residency & Ohio University, Heritage College of Osteopathic Medicine

Abstract: Electronic health records (EHR) were implemented to improve patient care, reduce healthcare disparities, engage patients and families, improve care coordination, and maintain privacy and security. However, the mandated use of EHR has also resulted in significantly increased clerical and administrative burden, with physicians spending an estimated three-fourths of their daily time spent interacting with EHR, which negatively affects within-clinic processes and contributes to burnout. In-room scribes have been associated with improvement in all aspects of physician satisfaction and increased productivity, though less is known about the use of other technologies such as Google Glass, Natural Language Processing (NLP) and Machine-Based Learning (MBL) systems. Given the need to improve EHR documentation while decreasing administrative burden on clinicians and the discrepancies seen in patient perceptions of technology, there is a need to explore the intersection between varying degrees of technology in the clinical encounter. The aim of this study is to obtain information about patient impressions of technology use during a routine medical encounter. Video vignettes were shown to approximately 500 OhioHealth Physician Group patients and to ResearchMatch volunteers during an estimated 15-month period following IRB approval. Data includes a baseline survey to gather demographic and background characteristics as well as a perceptual survey where patients will rate the physician in the video on 5 facets using a 1 to 5 Likert scale. The analysis will include summarizing data of all continuous and categorical variables as well as overall perceptions analyzed using multivariate linear regression with perception score as the outcome variable.

Poster: 12

Tanner Hudson

Epidemiology of Patellar Dislocations in the United States: A 20-Year Analysis

Mentor: *Joseph Lyons, M.D.*

Department: Orthopaedic Surgery

Abstract: Introduction: Patellar dislocations are a common disabling injury in the young, active patient population. Despite this, epidemiologic data on patellar dislocations is scarce, and there are currently no up-to-date, population-based studies describing the incidence and demographics of patellar dislocations in the United States (US). This study employed a nationally representative sample to investigate the incidence and demographic characteristics of patients sustaining patellar dislocations in the US from 2001 to 2020. Methods: This descriptive epidemiologic study retrospectively analyzed acute patellar dislocations from 2001 to 2020 utilizing the National Electronic Injury Surveillance System (NEISS) database. Annual, overall, and age-adjusted patellar dislocation incidence rates, patient demographics (age, sex), and injury characteristics (mechanism) were analyzed. Incidence rates are expressed as the number of dislocations per 100,000 at-risk person-years. Average annual percent change (AAPC) estimates are presented to indicate the magnitude and trends in annual injury rates from 2001-2020. Results: An estimated total of 159,529 patellar dislocations were sustained in an at-risk population of 6,183,899,410 person-years, resulting in an incidence rate of 2.58 (95% CI=2.04-3.12). The data indicates a significantly increasing incidence over the study period from 2.61 in 2001 to 3.0 in 2020 (AAPC=2.8, p<0.0001) when controlling for population growth. Males accounted for 50.5% of cases, while females accounted for 49.5% of cases. Annual incidence increased significantly over the study period in both males (AAPC=2.3, p<0.0001) and females (AAPC=3.2, p=0.0002), and there was no significant difference in

the rates of increase between the sexes (p=0.2586). When considering age, statistically significant increases in annual incidence rates were observed among patients aged 10-19 years (AAPC=4.5, p<0.0001) and aged 20-29 years (AAPC=1.8, p=0.04), while no significant changes were observed in any other 10-year age group. Two-thirds of patellar dislocations involved sports-related injury mechanisms. The annual incidence of both sports-related and non-sports-related patellar dislocations increased significantly over the study period (sports-related: AAPC=2.6, p=0.0001; non-sports-related: AAPC=3.4, p=0.0001), and the rates of increase were similar in both groups (p=0.3312). Patellar dislocations occurred most commonly in basketball and dance, and annual incidence increased significantly in both sports (basketball: AAPC=2.5, p=0.042; dance: AAPC=4.0, p=0.008). Conclusion: The number of patients sustaining patellar dislocations is increasing in the US, especially among young people. Similar trends are observed in both male and female patients. A large percentage of injuries occur during athletic activity, but both sports- and non-sports-related patellar dislocations are on the rise. Certain sports (e.g., basketball, dance) are associated with a high risk of patellar dislocation. These injuries can be disabling in regard to sport and daily living; thus, increasing injury rates should promote increasing prevention efforts.

Poster: 13

Tanner Hudson

Retrospective Analysis of Opioid Prescription Patterns Following Anterior Cruciate Ligament Reconstruction in a Pediatric Population

Mentor: *Scott Huff, M.D.*

Department: Orthopaedic Surgery

Abstract: Purpose: The opioid epidemic has sparked discussions surrounding opioid prescription patterns and the role of healthcare in mitigating the effects of opioids on patients. In 2017, Ohio passed the Opioid Prescribing Guidelines limiting narcotic prescriptions for acute pain. This analysis of opioid prescriptions associated with pediatric ACL reconstruction provides data regarding pain management practices and insight on the impact of the OPG implementation on prescription patterns. Methods: This study retrospectively analyzed ACL reconstructions in patients aged ≤ 18 at a single pediatric hospital system from 2016-2018. Analysis included predictors of Morphine Equivalent Dose (MED) at discharge, predictors of receiving an opioid prescription within 90 days of surgery, the effect of OPG on discharge MED, and the likelihood of receiving an opioid prescription within 90 days of surgery both pre-OPG and post-OPG. Results: Discharge NSAIDS, sex, body mass, and sport had no significant impact on discharge MED. However, patient age had a significant relationship with discharge MED (P=0.002) and predicted that MED at discharge increases by 20.7 (CI 12.3-29.1) on average per each year increase in patient age; 20.7 MED is equivalent to 13.8mg Oxycodone or 20.7mg Hydrocodone, roughly 3 additional 5mg Oxycodone tablets or 4 additional 5mg Hydrocodone tablets. Significantly less discharge MEDs were prescribed post-OPG compared to pre-OPG (P<0.001). However, in the pre-OPG sample, 7.9% of patients received a follow up opioid prescription, compared to 33.3% percent of patients in the post-OPG sample (P=0.008). Additional analysis confirms that patients were significantly more likely to receive a follow-up opioid prescription post-OPG compared to pre-OPG (P=0.003; OR 5.833; CI 1.554-21.903). Sex, discharge NSAIDs, age, sport, follow-up NSAIDs, body mass, and discharge MED had no significant predictive value of the likelihood of patients receiving a follow-up opioid prescription. Conclusions: This study indicates that age independently predicted MED at discharge and this was not confounded by body mass. Discharge and follow-up NSAIDs had no significant impact on the likelihood of receiving a follow-up opioid prescription. Interestingly, while post-OPG patients received significantly less MED at discharge than pre-OPG patients, they were significantly more likely to receive a follow up opioid prescription. As a result of this study, we recommend

further analysis of a protocol of strict adherence to scheduled acetaminophen and ibuprofen following discharge to improve pain management and decrease follow up opioid prescriptions.

Poster: 14

John Karanja Kamau

Cardiomyopathy characterization of the mdx: lipin1 transgenic mice model

Mentor: *Hongmei Ren, Ph.D.*

Department: Biochemistry and Molecular Biology

Abstract: Duchenne muscular dystrophy (DMD) is a X-linked disease of muscle degeneration that affects approximately 1:3500 male births worldwide. Most DMD patients develop cardiomyopathic features between ages 10 and 15 years. DMD results from mutations in the gene for the cytoskeletal protein dystrophin. Dystrophin mutation triggers instability of the plasma membrane and myofiber death. Myocardial changes from progressive non-symptomatic preclinical stage to sporadic cellular hypertrophy and eventual cardiomyopathy with widespread necrosis. Patients die in their early thirties and the main cause of death is heart failure. Currently, there is no cure for the disease. Lipin1 is a phosphatidic acid (PA) phosphatase (PAP) that catalyzes the conversion of PA to diacylglycerol (DAG). Lipin1 is important for membrane fiber stability. Our data show that lipin1 protein and mRNA expression levels are significantly reduced in the cardiac muscle of the mdx mouse model of DMD. We generated a novel mouse model, mdx:lipin transgenic (mdx:lipinTg) mice, in which lipin1 is overexpression in cardiac muscle of mdx mice. We found out that overexpression of lipin1 in dystrophic heart improved cardiac muscle morphology by reducing; M2 murine macrophages deposition, inflammation, necroptosis and fibrosis in the myocardium. Our future study will evaluate whether overexpression of lipin1 could improve the function of dystrophic heart.

Poster: 15

Hayden Jaworski

The Role of the Microbiota-Gut-Brain Axis and Antibiotics in ALS and Neurodegenerative Diseases

Mentor: *Mark E. Obrenovich, Ph.D., M.Sc.*

Department: Pathology and Chemistry Case Western Reserve University and Louis Stoke Veterans Association Medical Center

Abstract: The human gut hosts a wide and diverse ecosystem of microorganisms termed the microbiota, which line the walls of the digestive tract and colon where they co-metabolize digestible and indigestible food to contribute a plethora of biochemical compounds with diverse biological functions. The influence gut microbes have on neurological processes is largely yet unexplored. However, recent data regarding the so-called leaky gut, leaky brain syndrome suggests a potential link between the gut microbiota, inflammation and host co-metabolism that may affect neuropathology both locally and distally from sites where microorganisms are found. The focus of this manuscript is to draw connection between the microbiota-gut-brain (MGB) axis, antibiotics and the use of "BUGS AS DRUGS" for neurodegenerative diseases, their treatment, diagnoses and management and to compare the effect of current and past pharmaceuticals and antibiotics for alternative mechanisms of action for brain and neuronal disorders, such as Alzheimer disease (AD), Amyotrophic Lateral Sclerosis (ALS), mood disorders, schizophrenia, autism spectrum disorders and others. It is a paradigm shift to suggest these diseases can be largely affected by unknown aspects of the microbiota. Therefore, a future exists for applying microbial, chemobiotic and chemotherapeutic approaches to enhance translational and personalized medical outcomes. Microbial modifying applications, such as CRISPR technology and recombinant DNA technology, among others, echo a theme in shifting paradigms, which involve the gut microbiota (GM) and mycobiota and will lead to potential gut-driven treatments for refractory neurologic diseases.

Poster: 16

Emma Newman

Accuracy and Sensitivity of FAST Examinations in Obese Geriatric Trauma Patients

Mentor: *Christa Siebenburgen, M.D.*

Department: Kettering Medical Center Acute Care Surgery

Abstract: Background: Geriatric trauma is increasing nationally and carries with it poorer prognoses. The Focused Assessment with Sonography for Trauma (FAST) exam aids in trauma assessment of hemoperitoneum and hemopericardium. Due to elderly patients age-specific abnormalities, an equivocal FAST exam may not rule out a critical disease process. Obesity is also increasing nationally and impairs FAST exam accuracy. Increasing prevalence of both obese and geriatric patients warrants analysis of current trauma detection practices. Methods: A retrospective chart review of trauma patients 65 years or older with a documented FAST exam between January 2015 and December 2020 was conducted at a level 2 trauma center. Demographic and outcome data were collected and analyzed between two groups, nonobese (BMI <30) and obese patients (BMI >30). Primary outcomes were FAST exam results and CT findings in order to determine sensitivity and specificity of the FAST exam in these groups. Results: A total of 185 total patients, 135 nonobese and 50 obese geriatric patients, met study criteria. The mean age was 77.5 years old amongst the two groups. Sensitivity and specificity of our FAST exam were 43.5% and 99.1% in the nonobese group, and 33.3% and 100% in the obese group, respectively. Statistical significance between groups was seen in trauma-related metrics among obese patients who had more operations, longer hospital and ICU length of stays, and a higher risk for sepsis. Conclusion: Study results showed an overall 10% reduction in sensitivity in FAST exams performed on obese geriatric patients, with a clinical significance between groups. Clinicians must have a higher index of suspicion of intrabdominal and intrapelvic hemorrhage on equivocal FAST exams in obese geriatric patients and monitor for increased complications. Additional studies are warranted to further examine FAST exam sensitivity, specificity, and clinician FAST exam training for elderly obese patients to optimize patient care and clinical outcomes for this population.

Poster: 17

Logan Nye

Weight-Bearing Radiographs are Associated with Higher Grading of Knee Osteoarthritis Compared to Supine Position in a Blinded, Radiographic Assessment

Mentor: *Anil Krishnamurthy, MBBS*

Department: Orthopaedic Surgery

Abstract: Introduction: Knee osteoarthritis (KOA) is a leading source of pain and disability globally. Effective diagnosis and treatment planning requires proper radiographic evaluation. KOA severity is commonly described using KellgrenLawrence (KL) grades. Although weight-bearing radiographs are typical in orthopaedic / musculoskeletal literature and practice, initial imaging can come from a variety of referring providers and may utilize supine patient positioning. Removing body weight from the knee may artificially inflate joint space, reducing diagnosis severity and altering treatment plans. The present study explores differences in KL grades in supine versus weight-bearing positions. Methods: IRB approval was obtained for this retrospective cohort study. Subjects were patients over 50 years old undergoing radiographs for knee pain at a Veterans Affairs hospital. Two fellowship-trained orthopaedic surgeons were blinded to all patient information and rated randomly arranged (with respect to position) knee radiographs using KL grades. The effects of position; reviewer (interrater reliability); and patient age, sex, and BMI were analyzed. Results: The present analysis included 50 patients undergoing supine and weight-bearing bilateral knee radiographs, representing 100 supine and 100 weight-bearing knee radiographs. Each surgeon graded weight-bearing images as having significantly

higher OA severity compared to supine images (Wilcoxon signed rank tests: Surgeon 1: S=-581.0, P=0.018; Surgeon 2: S=-921.00, P<0.001). Interrater reliability was low (κ=0.22, 95% CI 0.14-0.30). Logistic regression analysis showed that the likelihood of supine images having lower KL grades than weight-bearing images was slightly influenced by older age, a finding that was consistent across both surgeons (Surgeon 1: X2=8.52, p= 0. 0.004, OR: 0.92 [0.57-0.97]; Surgeon 2: X2=5.9, p= 0.015, OR: 0.93 [0.88-0.99]). Sex and BMI had no effects on KL grade differences. Discussion and Conclusion: Preliminary results show that weight-bearing knee radiographs are associated with higher KL grades when compared to supine radiographs of the same individual. Older patient age was correlated with increased likelihood that the standing films would be scored higher than supine. The interrater reliability was slightly lower than previous studies on KL scores. Future work includes analysis of a larger cohort of knees and analysis of intrarater reliability. However, results support the hypothesis that weight-bearing knee radiographs are associated with higher grading of KOA compared to supine radiographs.

Poster: 18

Betsy Gauthier

The effects of preterm birth, adverse birth outcomes, and BMI in biracial babies

Mentor: *Rose A. Maxwell, Ph.D., M.B.A.*

Department: Obstetrics and Gynecology

Abstract: Skin color plays a role in birth outcomes. It is well documented that having black skin color results in more adverse birth outcomes than white skin color. However, there is little known about birth outcomes for Biracial babies born to Black and White parents. This research aims to explore adverse birth outcomes in Biracial babies born to Black and White parents by investigating if having a White parent serves as a protective factor against preterm birth and birth outcomes such as patent ductus arteriosus (PDA), respiratory distress syndrome (RDS), and anemia. Additionally, we will explore if Biracial babies born to Black mothers with high BMI, have similar outcomes to Black babies born to Black mothers. Methods We used data collected from 19,496 babies delivered at Miami Valley Hospital in Dayton, Ohio between January 2012 and December 2017. These cases were examined for pregnancy outcomes and stratified by pre-pregnancy BMI category. Cases were excluded if they contained multiple births, missing maternal pre-pregnancy BMI, and missing gestational age at delivery. Groups were identified as premature [n=940]; very premature [n=396]; and extremely premature [n=220] in 386 normal weight women with BMI 18.5–24.9; 389 overweight women with BMI 25–29.9; 516 obese with BMI 30.0-39.9; and 265 women with BMI 40. We intend to use Statistical Package for the Social Sciences (SPSS) software to further stratify the groups by race into Black, White, and Biracial to determine (i) whether there is a correlation between skin color and preterm birth, (ii) whether there is a correlation in skin color and adverse birth outcomes (PDA, RDS, and anemia), in Biracial babies and (iii) whether there are similarities in the protective role of BMI in Black and Biracial babies. Conclusion Although race is a social construct, understanding its role and contribution in preterm birth and adverse birth outcomes will aid in the development of interventions for long-term disease and health complications.

Poster: 19

Courtney Payne

Examination of Breastfeeding Retention during the First 6 Months of Life, A Local Retrospective Study

Mentor: *Rose A. Maxwell, Ph.D., M.B.A.*

Department: Obstetrics and Gynecology

Abstract: The World Health Organization recommends breastfeeding an infant for the first six months of life. A mother’s breastmilk is a sustainable and natural source of nutrients for a newborn and is considered the “Gold

Standard" feeding practice for an infant. At large, the public health sector has promoted the inclusion of the breastfeeding advocacy to a worldwide and national agenda. The Centers for Disease Control and Prevention, Healthy People 2020 includes the following objectives: "to improve the health and wellbeing of women, infants, children, and families and to increase the proportion of mothers who breastfeed their babies." It should be highlighted that breastfeeding practices have been on a steady rise but there still lies great room for improvement, particularly in the rates of retention to feed for at least the first six months of life. Research has shown that hospital breastfeeding protocols, maternal education level and community support has great influence on the success of a mother's ability to breastfeed for the initial six months of life. The purpose of this evaluation is to investigate factors that positively or negatively influence a mother's ability to breastfeed an infant for up to 6 months and potentially beyond. This is a retrospective review of medical records from Healthy Start participants from January 2015 – December 2015. Participants were included if they were enrolled into the Five Rivers Health Centers Healthy Start Program during 2015 and lived in one of the seven target zip codes for the program in Montgomery County. The Healthy Start program follows women throughout prenatal care, delivery and until the child reaches its second birthday. Information for breastfeeding intention, initiation at hospital discharge, and continuation at 6 months were extracted from Healthy Start program data along with social factors such as education level, employment status, race, and marital status. This study was conducted as a quality improvement project to examine factors associated with continuation of breastfeeding to 6 months after delivery to inform future interventions to improve breastfeeding continuation rates to 6 months from delivery. After examining the data, women that worked part-time were more likely to stop breastfeeding before 6 months. Although the decrease is slight it may suggest further investigation regarding the challenges faced by women working part-time verses women who work full-time. The marital status of women seemingly influenced the number of women that breastfeed to 6 months or beyond. Single women experienced a greater decrease in breastfeeding practices postpartum than did married women. Future investigation on the challenges experienced by single women may help to increase breastfeeding retention to 6 months or greater. Additionally, substance use during pregnancy mainly effected breastfeeding initiation practices. An infant experiencing Neonatal Abstinence Syndrome for both marijuana and opiate use directly correlated with decreased breastfeeding initiation practices. This syndrome was the main reason baby formula was supplemented. With regards to breastfeeding support activities evidence suggest that the Five River Healthy Start Program has been successful in supporting Dayton, OH in overcoming negative barriers with access to standard care. With this information we can begin to look at potential recommendations to improve breastfeeding retention up to 6 months of life.

Poster: 20

Brandon Piyevsky

Evaluating the Readability of Online Testosterone Resources

Mentor: *Michael Callegari, M.D.*

Department: Urology

Abstract: Introduction: Patients and physicians are increasingly utilizing online platforms to disseminate health information. With the explosive interest and growth in testosterone therapy (TTh), online health information plays a significant role in patients' healthcare decisions. Our study evaluated the source, readability, and accuracy of web-based information available to patients regarding TTh. Methods: The first 50 web results from Google search terms "Testosterone Therapy" (TTh) and "Testosterone Replacement" (TR) were analyzed[RAG1]. Sources were categorized as Academic, Commercial, Institutional, or Patient Support before being evaluated using validated readability and English language text assessment tools including the Flesh Reading Ease score, Flesch Kincade, Gunning Fog, Simple Measure of Gobbledygook (SMOG), Coleman-Liau Index and Automated

Readability index. Results: 77 unique sources were identified. The average grade level required for understanding academic sources was 16 (college senior); commercial, institutional, and patient support sources were 13 (college freshman); 8 and 5 grade levels, respectively above the average U.S. adult. Patient support sources were most prevalent, while commercial sources were the least at 35% and 14%, respectively. The average reading ease score was 36.8, indicative of difficult-to-read material overall. Academic sources utilized 296% and 228% more words compared to commercial and institutional/patient support sources, respectively. Conclusions: The most immediate online sources for TTh information grossly exceeds the average reading level and understanding of most adults within the U.S. Within the growing realm of TTh, more attention should be taken to publish accurate, accessible, and readable material in order to improve patient health literacy and empower patients.

Poster: 21

Brandon Piyevsky

Impact and Implications of the COVID-19 pandemic on Urologic Training

Mentor: *Michael Callegari, M.D.*

Department: Urology

Abstract: Introduction: COVID-19 has had a tremendous impact on healthcare in the United States. Public health and hospital policy changes led to significant disruptions in patient care as well as medical training. Currently, there is limited understanding of how the pandemic impacted urology resident training across the U.S. We examined trends in resident involved in urologic procedures, as captured by the Accreditation Council for Graduate Medical Education (ACGME) performed before, during and briefly following the peak of the COVID-19 pandemic. Methods: A retrospective review was performed of publicly available urology resident case logs between July 2016 and June 2021. Cases were divided and analyzed with linear regression models using year and category as predictors. Statistical calculations were conducted using R (version 4.0.2). Results: Analysis of procedures performed by urology residents indicate an upward trend of urology cases nationally on average. Starting in 2016, the national average of general urology procedures has increased by 4-5 each year except for 2020, which saw a drop in volume. However, in 2021 case volume dramatically increased to the same rate as projected had there not been a disruption in 2020. The same analysis applied to other categories of urology procedures resulted in identical findings of a decrease in 2020 followed by a quick rebound in 2021. Conclusions: Despite widespread pandemic-related disruptions in surgical volume, there has been minimal detriment to urologic resident training over time. Urologic care is essential and in high demand as evidenced by the uptick in volume across the U.S.

Poster: 22

Brandon Piyevsky

Readability Assessment of Online Men's Health Education Materials from the Sexual Medicine Society of North America, Urology Care Foundation, and European Association of Urology

Mentor: *Michael Callegari, M.D.*

Department: Urology

Abstract: Introduction: The use of online health information by patients has gained considerable attention during the last decade. The National Institute of Health (NIH) and American Medical Association (AMA) advocate the dissemination of accessible and readable resources. We aimed to evaluate the readability of online patient resources from the Sexual Medicine Society of North America (SMSNA) website. Methods: Content published under the web-section “SMSNA: For Patients - conditions and topics'' portal (n=16) were reviewed. Identical topics published online via Urology Care Foundation (ie AUA; n=8) and the European

Association of Urology (ie EAU; n=8) were also reviewed. Readability and estimated educational level required for understanding was assessed using validated readability and English language assessment tools including the Flesh Reading Ease score, Flesch Kincade, Gunning Fog, Simple Measure of Gobbledygook (SMOG), Coleman-Liau and Automated Readability index. Results: SMSNA online patient education materials (PEM), on average, are written at a college sophomore reading level (14th grade). This is 6.5 and 8 grade levels higher than the average U.S. adult and recommended reading levels for PEM, respectively. Comparable AUA and EAU resources were an average of 10th (p<0.05) and 12th (p=0.854) grade reading levels, respectively. Conclusion: Men's sexual health PEM's published online are written at an advanced reading level, most notably the SMSNA compared to equivalent professional sources. This could pose a barrier to patient understanding and impact patients' engagement and health decision-making. One proposed mitigatory strategy is for PEM to provide improved readability, and appropriate user-friendly language to facilitate easier and inclusive understanding, outreach, and educational support.

Poster: 23

Brandon Piyevsky

Urologic Practice Consolidation: A Cross Sectional Analysis from 2014 to 2021

Mentor: *Christa Siebenburgen, M.D.*

Department: Urology

Abstract: Introduction: Physicians and medical practices have undergone significant consolidation over the last decade. This consolidation has been in response to several factors, most notably, federal and financial changes to health care delivery within the United States (US). This has not only influenced provider volume and experience but also impacted patient care and delivery within the marketplace. Per the 2021 AUA annual census, the percentage of employed practicing urologists (not in solo or partnership practice) increased from 51.3% to 64.4% between 2015-2020 (AUA Census 2021). Our objective was to further examine the changing trends among provider groups within Urology between 2014 – 2021. Methods: Publicly available information from within the Medicare Physician Compare data set, published by thqe U.S. Centers for Medicare and Medicaid Services (CMS) was utilized. Practice size data was pulled from one month each year between 2014 – 2021 and filtered by physicians listing "Urology" as their primary specialty. Practices were divided into categories based on size. Statistical calculations were conducted using R (version 4.0.2). Results: Urologists practicing in solo or partnership practice declined by 15.9% compared to those joining larger groups which increased by an average of 5.1%. Providers within the Northeast U.S. illustrated the largest migration to larger practices with 101%, 162% and 232% growth amongst practices with 25-99, 100-499 and over 500 providers respectively. Conclusions: Urologists have been moving towards larger group practice models between 2014 and 2021. An emphasis on value-based healthcare, integration of electronic records and an increase in administrative workload are only some of the influencing factors likely responsible for this trend. Further studies are needed to examine the effect practice consolidation has on patient outcomes and cost of care.

Poster: 24

Nanditha Ravichandran

Could the Stress Index Be Useful in Early Recognition of Adverse Physiological Changes in Elderly Trauma?

Mentor: *Mbaga Walusimbi, M.D.*

Department: Surgery

Abstract: Background: The elderly population has a high predicted mortality after trauma due to a decreased physiologic reserve. Early recognition and prompt intervention of adverse physiological changes is imperative to impact mortality. The stress index, blood glucose level/ serum potassium on arrival, might be a useful tool for

early recognition of the adverse physiological changes. The aim of this study was to determine the correlation of the stress index and injury severity in the elderly trauma patients. Methods: Retrospective study of trauma patients 65 years and older with an initial GCS of 12 and higher admitted to our Level 1 trauma center between 2010 and 2020. Demographics, blood chemistry and anatomic AIS were obtained, calculations of GCS, TRISS GTOS, ISS and stress index were done. Chi-square test, ANOVA, independent t-test and regression analyses were statistical methods used for data analysis. Results: There were 18,649 trauma admissions, 31.11% were 65 years of age and older of which 6.38% died. Survivors and the deaths were comparable in age, BMI, GCS and vital signs at the time presentation. The mean ISS among deaths at 24-hours was 24.00 vs 10.67 (p=.001). Thirty-nine percent of the deaths had abnormal initial EKG's with non-ischemic changes, read as stable or unstable arrhythmia compared with only 22% in the survivors. Extremity and spinal fractures were the most common injuries among the deaths 72% and 44% respectively; compared with 40% and 15% respectively in the survivors. There was a significant difference in the mean stress index (blood glucose/potassium) at admission between the deaths and the survivors, 46.68 vs 32.01 (p-value = 0.01). Conclusion: The stress index maybe a useful early parameter in identifying elderly patients at risk of death. More studies are needed for validation. Level of Evidence: IV Key Words: elderly, trauma; stress index; mortality

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Poster: 25

Vijay Rings and Ali Zia

Outcomes of Traditional Upper Airway Surgery and Upper Airway Stimulation in Morbidly Obese Patients

Mentor: *Eugene G. Chio, M.D.*

Department: Otolaryngology

Abstract: Objective: To investigate surgical outcomes of morbidly obese patients after undergoing traditional sleep surgeries and upper airway stimulation. Methods: We performed a retrospective review of morbidly obese (BMI≥40) patients who underwent OSA surgery from March 2014 to March 2021. Pre- and post-operative clinical information was collected, including polysomnography (PSG) data and the Epworth Sleepiness Scale (ESS). Surgeries included uvulopalatopharyngoplasty, hyoid myotomy and suspension, upper airway stimulation, or a combination of multiple surgeries. Apnea-Hypopnea Index (AHI) and Epworth Sleepiness Scale (ESS) were analyzed to assess surgical outcomes. Results: A total of 45 patients met study inclusion criteria. Significant improvement in mean AHI (48.4 to 28.32, P < 0.05) and mean ESS (12.0 to 8.23, P < 0.05) was shown after surgical intervention. When controlling for sex, tonsil size, and depression, these improvements remained significant. Reduction in BMI 1-year postoperatively was not significant (P = 0.24). Patients who underwent combined hyoid and UPPP therapy demonstrated a significant reduction in both AHI values and ESS scores (P < 0.05). Patients who underwent hyoid therapy alone demonstrated significant reduction in their AHI (P < 0.05). Despite not meeting BMI criteria determined by the FDA, 7 patients underwent upper airway stimulation and demonstrated a significant reduction in ESS values (P < 0.05). Conclusion: This is the first study to evaluate the effectiveness of UPPP, hyoid myotomy and suspension, and UAS in morbidly obese patients. Our results suggest these interventions may provide patients with objective and symptomatic improvement in OSA. Key words: morbid obesity, obstructive sleep apnea, osa surgery, hypoglossal nerve stimulation, uvulopalatopharyngoplasty, hyoid myotomy and suspension

Poster: 26

Cory Roeth

Prevalence of Gunshot Wounds to the Head in Civilian Trauma and Factors Associated with Mortality: A 15-Year Experience

Mentor: *Priti Parikh, Ph.D.*

Department: Surgery

Abstract: Introduction: Gunshot wounds to the head (GSWH) with resultant brain injury are a leading cause of mortality following traumatic brain injuries, with known dismal survival rates. Physicians are often faced with the challenge of determining the aggressiveness of initial and subsequent resuscitative efforts. We sought to determine the prevalence and trend in civilian GSWH seen at our level 1 trauma center and to assess features and mechanisms that may indicate decreased probability of survival following the injury. Methods: All adult patients admitted to an American College of Surgeons verified Level I Trauma Center between January 2006 and December 2020 with GSWH were identified from the trauma registry. Demographic data were collected, such as gender and age; and clinical data were collected, including the intent (self-inflicted or otherwise), cerebral hemisphere involvement (unilateral or bilateral), brain stem involvement, frontal lobe involvement, and mortality outcome from the patient records. Non-parametric continuous variables were analyzed by Mann-Whitney U test and non-parametric categorical variables were analyzed by logistic regression. Preliminary Results: Our level 1 Trauma Center saw an increase in GSWH by 53% from 2006 to 2020. Self-inflicted GSWH increased, accounting for 41.1% of all GSWH in 2006 and 50% of all GSWH in 2020. The mortality rate following GSWH was 66.1%. Self-inflicted intent, bi-hemispheric involvement, brainstem involvement, older age, higher head AIS and ISS scores, and lower RTS scores were variables significantly (p < 0.05) associated with mortality. Conclusions: Over the 15-year study period, Miami Valley Hospital saw an increase in total GSWH and in self-inflicted GSWH. GSWHs remain highly fatal, and the mechanism is more often self-inflicted. Involvement of both hemispheres or the brainstem and self-inflicted intent are factors significantly associated with mortality. Recognition of these factors, in conjunction with awareness of the GSWH mechanism may be helpful in prognostication. The increasing prevalence of self-inflicted GSWHs highlights the need for public health advocacy regarding suicide awareness, preventive mental health intervention, and physician-patient discussions regarding firearm ownership in those with risk factors for suicide.

Poster: 27

Parvaneh Shadkam-Farrokhi

A Student-Led QI Initiative to Increase Resident Referrals for Diabetes Self Management Education (DSME) in a Federally Qualified Health Center

Mentor: *Elisabeth Righter, M.D.*

Department: Family Medicine

Abstract: Background: The Five Rivers Health Family Center (FRHFC) is a Federally Qualified Health Center serving over 25,000 low-income and minority patients, many of them diagnosed with diabetes. Diabetes Self-Management Education (DSME) can improve shared decision making and hemoglobin A1c (HbA1c) levels. However, an initial analysis of patient charts found that 17 family medicine residents working at FRHFC were not referring eligible adult patients with HbA1c > 9 for DSME. Our SMART Aim was to improve the process of residents ordering DSME referrals for adult patients with T2DM and HbA1c>9 and see an increase in referral rate from 0% to 33% within one week. Methods: The study population is Family Medicine residents rotating at Five Rivers Health Family Center managing adult patients (18 and older) with a diagnosis of type 2 diabetes (T2DM) who were seen in the clinic and had a point of care HbA1c > 9. The baseline data was collected from Epic EHR for one week between November 29, 2021, and December 3, 2021, and post intervention data was

collected between December 6, 2021, and December 10, 2021. After baseline data was collected, the intervention of creating a handout explaining DSME and how to order it was provided to residents and placed in easily accessible areas. Discussion: Seventeen family medicine residents rotated through the Five Rivers Health Family Center clinic. Within one week, the intervention led to increased referral rates from 0 to 25 percent with a significant p-value of <0.05. The QI project's SMART Aim was to increase the referral rate from 0% to 33%, but the goal of reaching a 33% referral rate in one week was not achieved. The initiative was the first of its kind to be incorporated into the clinic flow, so our inability to reach our goal in one week was expected. We also experienced issues such as not training nurses and residents on how to do the paperwork associated with DSME referral. Some modifications for the project include increasing the project run time, providing training to staff members, and including DSME in smart phrases used by residents for diabetes management. Despite not meeting the goal of increasing referrals to 33%, the project established a framework and introduced the idea to residents, priming them to be more inclined to place DSME referrals in the future once modifications are made.

Poster: 28

Michelle Adamczyk

Medical Student Confidence vs Exam Performance throughout Pre-Clinical Education

Mentor: *Dean Parmelee, M.D. and Alvin Silva, M.D.*

Department: Medical Education

Abstract: Confidence is a feeling that waxes and wanes and can be influenced by personal experiences in the academic setting. Previous research suggests that males and females demonstrate a difference in both self-reported confidence and apparent confidence as viewed by outside observers in academic settings. Additionally, abundant research shows that exam performance is influenced by factors including demographics and previous academic experiences. In this study, we explore the relationship between learner confidence and exam performance over time for medical students during their first and second years of medical school in a novel virtual setting due to the COVID-19 pandemic. Students self-reported their confidence on a scale of 1-3 before and after virtual learning sessions over the course of the preclinical period of medical school. Deidentified data of confidence values and exam performance was compared over time at both the individual level and as a class average. Analysis showed that students reported the highest confidence in the very beginning of their medical school education, the time period also showed the best exam performance. ANOVA analysis demonstrated a numerically small but statistically significant association between confidence after learning sessions for a unit with the score on the exam for that unit (r= 0.063, p<0.01). There were also slight but statistically significant differences between males and females in both exam performance and confidence, with overall average exam score for females of 76.9% vs 78.5% for males (p<0.01) and average confidence on a scale of 1-3 of 1.7 for females and 1.6 for males (p=0.02). These findings suggest the importance of valuing and working to build students' confidence as they proceed through medical school. This importance of confidence may be amplified in periods of change, whether in students' personal lives or due to broader events such as the COVID-19 pandemic.

Poster: 29

Elisabeth Adkins

Family Medicine Physicians and Patients with Developmental Disabilities

Mentor: *Paul Hershberger, Ph.D.*

Department: Family Medicine

Abstract: Introduction: Nearly 1 in 6 children in the United States have been diagnosed with some sort of developmental disability (DD). Attitudes of family physicians toward individuals with developmental disabilities

and their comfort with interacting with these persons can affect the care provided. The extent to which Family Medicine residents are being trained to provide care to persons with autism spectrum disorder (ASD) or intellectual disability (ID) is not known. We sought to assess family medicine residents' experience of treating patients with ASD or ID, residency training received pertaining to these patients, and the extent to which this formal training is perceived to be important. Methods: Residents and faculty in two area Family Medicine residency programs were invited to complete a 10-item survey regarding experience with and training for treating patients with DD. Frequencies and percentages were calculated for all categorical/ordinal variables to describe survey participants and question responses. Results: Twenty-two of 31 survey respondents (70.97%) reported it was important for Family Medicine residents to receive training to provide primary care to persons with DD. However, 29 (93.55%) reported uncertainty or inadequacy in their residency training to provide primary care to persons with ASD, and 26 (83.88%) in regard to persons with ID. Respondents also indicated that their understanding of DD was due more to personal experience than professional training. Conclusion: Data from this survey suggest that more formal training for providing care to persons with DD may be needed in Family Medicine residency programs.

Poster: 30
Alex Gilman
Innovative surgical workshops targeting undergraduate, premedical, and medical students
Mentor: *Barbara Kraszpulska Ph.D. and Robert Lober M.D., Ph.D.*
Department: Department of Anatomy Boonshoft School of Medicine & Department of Neurosurgery Dayton Children's Hospital
Abstract: Knowledge of anatomy and comprehensive body navigation is essential for operating specialties and the practice of medicine. Focused surgical anatomical training exposure at undergraduate and medical student levels aims to increase functional understanding of medical anatomy and draws an early exposure to surgical career fields while enhancing surgical confidence.

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Stephanie Hearne
4th-Year-Student-Led Community Resources Clerkship Module Addressing Social Determinants of Health
Mentor: *Marilyn Kindig, D.O.*
Department: Obstetrics and Gynecology
Abstract: Background: Effective utilization of community resources is an integral part of medical practice and patient care but is a proficiency often overlooked in core clerkships curriculums. This 4th-year-student-led, case-based module engages 3rd-year clerkship students in a facilitated discussion on social determinants of health and how the use of community resources can combat systemic inequities within the community and medical system. This module was created and organized by a 4th-year medical student in collaboration with social workers and medical school faculty. It allows a fourth-year student to gain skills and experience on presenting cases, virtual teaching, and researching community-based patient resources, while 3rd-year students can advance their patient counseling skills, engage with community programs, and empower patients with knowledge of local resources. With the amount of time medical students spend interviewing and counseling OBGYN patients, a knowledge of preventative medicine and available solutions for socioeconomic barriers to healthcare have a great potential to improve both maternal and fetal long-term healthcare outcomes. Methods: This virtual, interactive module consisted of a powerpoint presentation lasting one hour. A total of seven patient cases were discussed consisting of common situations in women's health (hypertensive management, birth-control counseling, breastfeeding, and sexually transmitted infections) with incorporated

social determinants of health factors (language barriers, screening for domestic abuse and human trafficking, transportation barriers, and affordability of medications). Multiple choice and open-ended discussion questions pertaining to each case were discussed by virtually calling on students and using the “chat” function for learners. Students were also called on to provide thoughts on each patient’s access to care that should be addressed during the “visit.” Finally, community resources specific to each case were shared with students at the end of the session. A pre-class survey was provided to students asking questions about their baseline knowledge concerning community resources and social determinants of health pertaining to OBGYN patients. The same survey was sent out after class to assess improvement in knowledge as well as gather feedback from students. Data was compared from the pre and post class surveys. Results and Discussion: Survey results were collected from eight different clerkship groups. A total of 66 students participated in the study. The three survey questions could be answered on a scale of 1-5 (5 = high level of understanding, 1 = none at all). Results indicated improved knowledge of community resources pertaining to OBGYN patients after completion of the module, with pre-class numbers averaging to 2.13 and post class averaging 4.16, a difference of 1.98 (95% CI = 1.74-2.22), and two-tailed p value less than 0.0001. There was also improvement made to the knowledge of social determinants of health with a pre-class average of 4.00 and post-class average of 4.69, a difference of 0.69 (95% CI = 0.49-0.89) and p value less than 0.0001.

Poster: 32

Ericson John Torralba

Integration of Abdominal Imaging into a Gross Anatomy Medical School Curriculum

Mentor: *Dean Parmelee, M.D. and Alvin Silva, M.D.*

Department: Medical Education

Abstract: Purpose: This pilot intervention study assessed the viability of integrating abdominal radiology into a medical school gross anatomy curriculum. Materials and methods: Second-year medical students from Wright State University Boonshoft School of Medicine were invited to participate in an abdominal imaging workshop alongside their gross anatomy course. The workshop consisted of a 17-question test administered before and after abdominal radiologic instruction with self-reported confidence levels. The intervention group was compared using paired t-test, while the intervention and control groups were compared using two-sample t-tests. Spearman rank correlation coefficients for associations between scores and confidence levels were determined. Results: 25 subjects were included in our study. 11 subjects in the intervention group completed the course showing test average improvement (65.7% vs 80.2%, p<0.01). 9 subjects completed a pretest only with a similar average test score compared to the intervention group (68.4% vs 65.7%, p=0.71), thus serving as a control group. The pretest (control) average was significantly lower compared to the posttest (intervention) average (68.4% vs 80.2%, p=0.05). 5 students completed the intervention and post-test and performed similarly to the intervention group (85.6% vs 80.2% p=0.29). Significant correlations between post-test confidence vs post-test scores and change in confidence vs post-test score in the intervention group (r=0.697, p=0.017), (r =0.660, p= 0.027) were noted. Conclusion: Integration of radiology into a medical school anatomy curriculum is shown to increase assessment scores and confidence levels. This method may be utilized to increase radiology interest and awareness while teaching students how to analyze medical imaging.

Poster: 33

Ericson John Torralba

Non-Invasive Medical Imaging of Thermal Burn Injuries Utilizing 94GHz Millimeter Wave Reflectometer

Mentor: *Elliott Brown, Ph.D. and Jeffrey Bryant Travers, M.D., Ph.D.*

Department: Pharmacology and Toxicology & Physics and Electrical Engineering

Abstract: Background: Thermal burn injuries are considered to be the 'forgotten global health crisis' and despite technological advancements in burn-wound therapy and management, there is an absence of noninvasive imaging technology to help determine burn depth. Burns result in changes to fluid balance within one's blood vessels and skin; therefore, increased tissue hydration can be indicative of a burn. In the last decade, terahertz (THz) technology has been developed and utilized for various applications in homeland security, automated vehicles, and medicine. Further studies have applied the use of THz technology, and MM-wave technology at 30 GHz and 94 GHz, to assess hydration levels of various parts of the body. Porcine skin has previously been shown to be notably comparable to human skin; thus, our studies utilize its use for assessing hydration using a 94 GHz reflectometer sensors. Methods: Here, we induce thermal burn injuries on porcine skin and scan them using MM-wave sensors to explore thermal burn depth. A THZ brand was heated to 300º and placed on fresh pig skin for 10 seconds. The sample is left to incubate for 1 hour prior to MM-wave visualization. The image is generated, and reflectivity values are recorded. Punch biopsies are taken from samples and sent to dermatopathology for burn depth analysis. Results: Based on image analysis, our 94 GHz sensor shows sensitivity to various changes in relative depth, hydration, and surface roughness. Decreased reflectivity values depict lower hydration levels in the tissue and therefore, correlate with deep full-thickness burns. Conversely, higher hydration levels depict normal tissue. Statistical analysis for reflectivity and burn depth is being conducted to create a model for thermal burn imaging and human application. Conclusion: The use of a 94 GHz sensor can aid in determining subtle differences in skin burn injury that may not be visible to the naked eye. This technology may help burn surgeons in determining differences between partial and full-thickness burns which may aid in increase workflow efficiency and speedy clinical decision making.

Poster: 34

Colette Beard, Natalie Castillo, Monica George, Josef Rivera, and Estelle Viaud-Murat

Integrating COVID-19 Virus and Vaccine Education into new Refugee Onboarding at a Global Health Clinic: a Public Health Intervention

Mentor: *Katharine Conway, M.D., M.P.H.*

Department: Family Medicine

Abstract: This study will measure the impact of a public health intervention to educate new refugees at an urban Federally Health Qualified Center (FHQC) about COVID-19 and COVID-19 vaccines. Each refugee will receive a brochure about COVID-19 in their preferred language. The intervention will be in addition to the brochure and will consist of oral education provided by a community health coordinator (CHC) who has been trained using a newly developed Trainer's Guide on how to discuss COVID-19 with patients and points to emphasize in the process. In 2020, we conducted a study to assess refugee's perspectives and knowledge on COVID-19, which revealed that while refugees are more likely to trust healthcare providers, they are also less likely to receive information regarding COVID-19 compared to other patients at the same clinic. According to Clarke, S.K., Kumar, G.S., Sutton, J. et al. in their article, "Potential Impact of COVID-19 on Recently Resettled Refugee Populations in the United States and Canada: Perspectives of Refugee Healthcare Providers," key recommendations for resettlement and healthcare providers include analyzing sociodemographic data about refugee patients, documenting and resolving barriers faced by refugees, developing refugee-specific outreach plans, using culturally and linguistically appropriate resources, and ensuring medical interpretation availability. In addition, in, "The Effectiveness of an Educational Brochure," Bester N, Di Vito-Smith M, McGarry T, et al. state printed materials offer many benefits that make them well suited to the often rapidly changing knowledge base and recommendations—they are familiar, accessible, inexpensive, and convenient to use and, as such, have the potential to provide an effective method for disseminating information. With this background as a foundation, this project aims to implement a refugee-specific outreach plan combining the use of a linguistically

appropriate brochure with an educational and culturally sensitive conversation explaining the information in the brochure about the COVID-19 virus and addressing patient questions and concerns. Between January and April 2021, refugees receiving care at the FQHC will receive a translated COVID-19 brochure during their onboarding meeting with the CHC, be given time to read it, and then be randomized to complete a paper survey in their preferred language either before or after receiving personal education from the CHC and accompanying interpreter. The survey will be used to compare knowledge about COVID-19 based upon the brochure alone or the brochure combined with additional education from a CHC who has been prepared by a newly developed Trainer's Guide based on current CDC information and guidelines. Descriptive, comparative, and thematic analyses will be completed. We hypothesize that there will be more accurate knowledge of COVID-19 in the group who receives both the brochure and education. The study will help elucidate the extent to which combining a provided brochure with direct, personal education enhances refugees' knowledge of COVID-19. FHQCs across North America can utilize findings from this study to determine strategies for enhancing newly arrived refugee's awareness and knowledge of COVID-19 and may adopt the Trainer's Guide for their own use in training healthcare workers on how to educate patients.

Poster: 35

Josef Rivera

'They can't get to the root of the hurt': A qualitative study of adverse experiences in the narratives of people with opioid use disorder

Mentor: *Sydney Silverstein, Ph.D.; Danielle Gainer, M.D. and Raminta Daniulaityte, Ph.D.*
Department: Boonshoft School of Medicine, Wright State University & College of Health Solutions, Arizona State University

Abstract: Background: The opioid epidemic has devastated communities across the United States. Narratives about over-prescription have been widely publicized in the media and generally accepted by the public as the primary reason why individuals use illicit opioids. While there are innumerable facts and data that support this reason, people who use illicit opioids (PWUIO) can attest that over-prescription does not communicate the whole story. For instance, adverse childhood experiences (ACEs) are one of many common narratives that have significant past and present impact for PWUIOs but are rarely explored. Several quantitative literatures have linked ACE-type experiences with substance use disorder (SUD) (Felitti et al., 1998; Stein et al., 2017). While we understand that these correlations exist, qualitative differences in experience of the relation of ACE-type events to current drug use remains poorly understood. This study aims to understand why ACE-type events are correlated with SUD through the examination of the individual stories of PWUIOs. Methods: Qualitative interviews were conducted with 67 individuals who met the DSM-5 criteria for moderate to severe OUD. Interviews were transcribed in their entirety and thematically coded. Select codes were analyzed using iterative categorization to determine how interviewees describe past childhood trauma and how those incidents have affected and currently affect their substance use. Results: Three broad thematic categories emerged from the research: intergenerational drug use, childhood trauma, other. The intergenerational drug use category included the dynamics of drug use within a family setting, feelings of an evitable destination of using drugs due to a family history of drug use, and experiences of family bonding through shared drug use. The childhood category explored how childhood physical and sexual trauma, perpetuated by an adult caregiver, impacts an individual's drug use trajectory and their current drug use. The final category includes thematic summary statements that were not included in the former categories but were important to highlight. These statements expound upon an individuals' solutions to solve their drug use. Additionally, four distinctive typologies emerged from the data: (1) Casual Mentioners, (2) Haunted by Trauma, (3) Seeking Redemption, and (4) Reckoning with Inevitability. Casual mentioners were participants that nonchalantly mentioned ACE-type experiences as

relevant to their drug-use trajectory. Participants haunted by trauma strongly attribute traumatic ACE-type experiences to their drug use to and/or use drugs to numb memories. Individuals seeking redemption are described as those who acknowledge that ACE-type experiences contributed to their drug use but articulated a desire to triumph over them. Individuals reckoning with inevitability understand their drug use to be unavoidable or inevitable due to their intergenerational experiences of it. Discussion: This study's findings will offer insight to health care providers and peer-support counselors on the impact of ACEs have on the lives of PWUIOs. This study will also provide necessary insight to improve the administration of trauma-informed care and interventions. More research is needed to explore how these typologies might guide individuals towards specific interventions.

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Natalie Castillo, Monica George, Estelle Viaud-Murat, Colette Beard, and Josef Rivera

Unseen Barriers and Opportunities for Public Health Intervention observed in Secondary English Speakers during the SARS-CoV-2 Pandemic, with emphasis on the Hispanic/Latino population

Mentor: *Katharine Conway, M.D., M.P.H.*

Department: Family Medicine

Abstract: Introduction: In 2019, a new variant of coronavirus, SARS-CoV-2 (COVID-19) created a global pandemic that has highlighted and exacerbated health disparities. Educating the general public about COVID-19 is one of the primary mitigation strategies amongst health professionals. Studies have found a discrepancy in the amount of information available about COVID-19 for non-English speaking patients compared to English speaking patients. An estimated 22% of the US population primarily speaks a non-English language, with 13% primarily speaking Spanish, making mass communication efforts difficult to achieve. This study seeks to understand and compare several topics surrounding COVID-19 health communication and identify potential healthcare disparities between secondary English speakers (SES), with an emphasis on Hispanic/Latino patients, and primary English-speaking patients (PES). Methods: A cross sectional study was conducted from February 15th to April 2nd, 2021 and included 144 participants at a Federally Qualified Community Health Center in Dayton, Ohio. A survey available in seven languages was administered to patients at this community health center, which also serves global health patients, or SES. Most of the questionnaire gathered information on patient's experiences and beliefs regarding the COVID-19 virus, vaccination, and sources of information. Descriptive statistics and comparative analysis were performed between SES and PES. Results: Analysis of 144 surveys, 33 of which were SES, showed that 92.7% of all patients agreed that COVID19 was a serious disease and 63.9% would receive the COVID-19 vaccine. Participants who identified as SES were more likely to exhibit a positive perception of vaccines. Regarding understanding of COVID-19, SES were less likely to feel informed or to correctly identify symptoms of COVID-19. They were also less likely to report receiving pandemic information from healthcare professionals. The most common source of information included TV or radio (70.8%) and the preferred method of translated information was mailed handouts (28.8%). SES were more likely to feel the government had ensured their safety and trusted information more than their primary English-speaking counterparts. Out of the 144 individuals, 9 identified as Hispanic/Latino and 7 were primary Spanish speakers. Of the Hispanic/Latino population, 66.7% said they would receive the COVID-19 vaccine. However, compared to the general public, they were less likely to encourage family and friends to get vaccinated. Furthermore, only 22.2% of patients who identified as Hispanic/Latino had received the first shot of the COVID vaccine, compared to 46.2% in the general survey. Conclusion: SES had more positive responses to almost all categories, with all positive predictors of vaccination and health behaviors, and yet lower COVID-19 vaccination rates. This discrepancy illuminates the gap in healthcare that these patients face and highlights the importance of identifying and improving these gaps. SES likely have poor access to vaccination and delayed translation of

materials. Applying this information, we can examine how to better disseminate information and design targeted resources to intervene and address health disparities among patients seeking care at an urban community health center. As providers were identified as a trusted resource, this relationship can be used to further instill trust in communities regarding vaccination.

Poster: 37

Monica George and Estelle Viaud-Murat

Language Proficiency Influences Disease Prevention Behaviors: Patterns Observed in the Influenza and COVID-19 Vaccines

Mentor: *Katharine Conway, M.D., M.P.H.*

Department: Family Medicine

Abstract: Problem Under Investigation: Vaccines are a highly effective tool against preventable diseases, but only when used with high rates of acceptance and coverage. In light of the rapid COVID-19 vaccine rollout, vaccine hesitancy presents a particular challenge meriting further study. Much is already known regarding influenza vaccine hesitancy and the impact of English proficiency. This study aims to explore connections between the influenza and COVID-19 vaccines attitudes and uptake, as well as the role of English proficiency with an emphasis on the Spanish speaking subset of the population. Methods: A cross-sectional study was conducted from February 15th to April 2nd, 2021, at a federally qualified health center in a midwestern city. Surveys on the influenza and COVID-19 vaccines were administered to 144 participants, including 33 Secondary English speakers (SES) and 19 Spanish speakers, representing countries including Mexico, Colombia, and Honduras. Descriptive statistics and a comparative analysis were performed. Results: Participants vaccinated against influenza were more likely to receive the COVID-19 vaccine (p < 0.001). Adherence with the influenza vaccine was associated with positive perceptions toward both the influenza and COVID-19 vaccines, as well as participation in disease prevention behaviors. SES were found to exhibit a more positive perception of vaccines and to be immunized against influenza, but less likely to have the COVID-19 vaccine. Compared to their non-Spanish speaking counterparts, the 19 Spanish speakers displayed higher hesitancy for the influenza vaccine compared to the COVID-19 vaccine. Conclusion: This study demonstrates that improving perceptions of one vaccine can have a sizable impact, as it will increase uptake for not only the given vaccine but for other vaccines and health behaviors as well. Analysis of the SES population revealed discrepancies in this pattern that signify barriers beyond perception limit COVID-19 vaccine access for limited English speakers. By better understanding how vaccine perceptions and language proficiency interplay, public health efforts can be tailored to reach vulnerable populations.

Poster: 38

Estelle Viaud-Murat

We See Things Differently: Comparing and Contrasting the Perceptions of Local Staff and Visiting Healthcare Workers During Global Health Rotations

Mentor: *Priti Parikh, Ph.D.*

Department: General Surgery

Abstract: Objective: As global health rotations gain in popularity, it is critical to understand the perception of the local staff and international healthcare visitors (IHCVs) to address gaps and optimize experiences. This study compares and contrasts the perceptions of the local staff and IHCVs on their visits, impact on a local hospital, and knowledge they wish IHCVs had prior to their visits. Methods: An IRB approved survey was distributed to all the local staff and IHCVs of a rural mission hospital in Kenya from Aug-Sep'20. The survey included both open- and closed-ended questions regarding perceived challenges for the local hospital and things IHCVs should know

prior to their trips. Data were analyzed descriptively and thematically. Results: There was a 63.9% response rate (76/119) for the staff members; mean age was 37.4±11.4years and 55.84% of respondents were male; and 52.0% response rate (26/50) for IHCV; mean age was 45.3±17.9years with 57.7% (15/26) females. In contrast to our previous study where 42.1% of local staff respondents perceived negative impact of visitors, only 7.7% (2/26) of IHCV perceived their visit as having a negative impact on the local hospital primarily through diversion of resources away from patient care and compromising patient safety. IHCVs perceived challenges for the local hospital while hosting visitors included navigating the language barrier, and providing accommodation and orientation. While local staff had similar perceptions, they also mentioned financial strain on the local hospital and salary reductions due to visitors. Table 1 describes the information local staff and visitors wished they knew before their visits. While local staff highlighted the importance of knowing local protocols, teamwork, respecting and appreciating locals, and cultural humility, the visitors wished they knew more about the local diseases, supplies needs, packing for travel, and slow-paced local healthcare culture. Conclusions: There is a clear discrepancy overall in the perception of local staff and international visitors on impact of their visits to the hospital, and how visitors could be better prepared. The study suggests that clear communication and expectations from the local facility and sending institutions would further optimize global health experiences of their medical trainees and professionals.

Poster: 39

Morgan Cooley

Quality Improvement: Patient Education for Management of Hypertension in Pregnancy

Mentor: *Rose A. Maxwell, Ph.D., M.B.A.*

Department: Obstetrics and Gynecology

Abstract: Objective: To assess the effectiveness and efficiency of patient education tools for hypertension in pregnancy. Methods: Pre-intervention patient education included discussing the symptoms and management of hypertension in pregnancy. Two education tools were introduced for the intervention. Pregnant women with hypertension completed a questionnaire including questions for objective (Actual) knowledge and self-reported (Perceived) knowledge about hypertension. One group (Pre-I) completed the questionnaire before implementation of the new tools and a different group (Post-I) completed the questionnaire after implementation. Providers were surveyed before and after introducing the tools. Results: Pre-I women (N=45) rated their Perceived knowledge of hypertension as high (4.2± 1.0) but had low Actual knowledge (1.7± 1.3) scores. Post-I women (N=45) rated their Perceived knowledge higher (4.5 ± 0.7) than the Pre-I group. The Post-I group, while having low scores on Actual knowledge (2.2 ± 1.0), showed significant improvement in objective knowledge compared to the Pre-I group (p<0.05). Providers reported significant improvement in satisfaction with the education after using the new tools (2.6 ± 1.1 vs 4.1 ± 0.7; p<.001). Providers reported improvement in patient comprehension (2.5± 0.6 vs 3.5± 0.5; p<.001) and confidence (2.7 ± 0.6 vs 3.6± 0.5); p<0.001) in the Post-I group compared to the Pre-I group. Providers reported a significant decrease in time (minutes) needed for education with new tools (17.8±8.5 vs 7.8 ± 4.3; p<.001). Discussion: After introducing the new tools, patients had higher actual knowledge scores, providers rated higher scores for patient knowledge, and providers reported needing less time for education.

Poster: 40

Tiffani Spaulding, Tamiel Murray, and Katherine Wilcher

HIV-related Stigma, Experiences of Discrimination, and HIV Care Outcomes among Older African Americans Living with HIV in Ohio

Mentor: *Timothy Crawford, Ph.D., M.P.H. and Sydney Silverstein, Ph.D.*
Department: Population and Public Health Sciences & Family Medicine

Abstract: Background: In the U.S., African Americans are disproportionately impacted by HIV and consistently less likely to engage along the HIV care continuum long term (i.e., linked to care, retained in care, adherent to medication, and virally suppressed). Continued engagement along the HIV care continuum promotes living healthier, longer lives, while reducing the risk of transmission to others. Existing research suggests that have suggested that HIV-related stigma (HRS) and experiences of discrimination may impede optimal engagement; however, most of the research has focused on younger populations, overlooking older adults (≥50 years) living with HIV. Because the majority of those living with HIV in the U.S. are ≥50 years of age and older (YOA), it is becoming crucial to understand the factors that prevent optimal engagement, specifically among African Americans. Objectives: The purpose of this pilot study was to explore the impact of HRS through every day/major experiences of discrimination on medication and visit adherence among older African Americans living with HIV in Ohio. Methods: The demographic criteria for those eligible to participate in an online survey included those who were living with HIV and in Ohio, identified as Black or African American, and ≥50 YOA. Participants who completed the survey received a $25 gift card. The Stigma revised scale was a necessary tool used to assess HRS. The scales of everyday and major experiences of discrimination were used to assess various experiences of discrimination. Poor medication adherence was defined as participants who reported missing at least four days of antiretrovirals in the past three months. Poor visit adherence was defined as participants reporting that they missed at least one HIV clinic visit in the past 12 months. Logistic regression models were conducted to examine the impact of HIV-related stigma, everyday discrimination, and major experiences of discrimination on medication and visit adherence. Each model controlled for age, time since diagnosis, and sexual orientation. Results: A total of 53 individuals completed the online survey. The average age was 53.6 ± 2.1 years (range = 50.0 to 58.0) and the average time since diagnosis was 2.9 ± 1.7 years (range = 0 to 7.0). Participants reported high experiences of stigma with a mean of 29.5 ± 2.7 (range = 10 to 40). Participants reported high levels of everyday and major experiences of stigma with 96% and 89 of participants, respectively, stating that these experiences were due to race. Almost half (49.1%) of the participants reported poor medication adherence and almost a third (31.4%) reported poor visit adherence. HIV-related stigma (adjusted odds ratio (aOR) = 1.39; 95% Confidence Interval (CI) = 1.02 – 1.89) and major experiences of discrimination (aOR = 1.70; 95% CI = 1.11 – 2.60) were associated with a greater odds of poor medication adherence. Additionally, major experiences of discrimination were associated with a 3-fold increase in the odds of poor visit adherence (aOR = 3.24; 95% CI = 1.38 – 7.64). Conclusions: HRS and major experiences of discrimination impedes the opportunity for older African Americans living with HIV to be optimally adherent to medication and HIV clinic visits. To reduce the impact of stigma and discrimination on HIV care engagement our first step must be understanding how HIV-related stigmatization and discrimination impacts engagement among older African Americans living with HIV.

Poster: 41

Whitney Jenkins

Motivations for Using Methamphetamine in Dayton, Ohio a Mixed Methods Study

Mentor: *Sydney Silverstein, Ph.D.*

Department: Population and Public Health Sciences

Abstract: Introduction: The recent resurgence of methamphetamine (meth) has increased availability across the United States and particularly in the Dayton, Ohio area which is at the center of the ongoing overdose crisis. This study aims at identifying and understanding the motivations for using meth with a focus on those using illicit opioid coinciding with meth. Meth use among people who use opioids is a growing public health concern which needs to be explored. Methods: Participants residing in the Dayton area who reported using meth within the past 30 days, were interviewed with a structured and semi-structured segment. The interviews focused on demographic characteristics, health insurance and physical health, psychiatric status, drug use history, history and patterns of use of meth and other drugs, motivations for use and perceptions of risks and benefits associated with meth use. Descriptive statistics and chi-square tests were performed to test for statistical significance Complementary qualitative data was explored to provide more insight on the initiation patterns and motivations. Results: The most frequently reported primary reasons for using meth were to get more energy, to enjoy the high and to help with emotional problems. Participants who used fentanyl within the past thirty days reported similar primary reasons for using meth as those who did not use fentanyl within the past thirty days. It was also described that participants transitioned to using meth because it was easily available and at a low cost. Discussion & Implications: Initiation into meth use and the motivations for using meth are impacted by environmental, social, and societal factors. The findings of this study have valuable implications for insight on the motivations driving meth use, research, substance use prevention, intervention, and treatment.

Key words: Methamphetamine, motivations, initiation, Dayton, Ohio

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Poster: 42

Catherine Evers Smith

Impact of Social Determinants of Health on Infant Mortality

Mentor: *Amber Todd, Ph.D.*

Department: Medical Education

Abstract: Objective: The objective of this paper is to determine the impact of social determinants of health on infant mortality in Ohio counties in 2021. Methods: The rates of infant mortality in Ohio, Kentucky, Indiana, and West Virginia counties in 2020 were compared using an ANOVA with post hoc tests. The rate of infant mortality was correlated with rates of smoking, uninsured adults, obesity, median household income, percent non-Hispanic black, Hispanic, non-Hispanic white, and rural using Pearson/Spearman correlations. A stepwise linear regression was used to determine how the rates of exercise, access to healthy food, and smoking account for variance in infant mortality. Results: This study found that Ohio, West Virginia, Indiana, and Kentucky have no significant difference in IMR in 2020. Smoking and lack of insurance correlated with IMR whereas they increase IMR also increases. Median household income and food environment correlated with IMR whereas they increase IMR decreases. Percent Hispanic, black, white, rural, and obese was found to have no significant correlation with IMR. Finally, the rate of physical inactivity, limited access to healthy food, and smoking in Ohio in 2020 accounted for 53.9% variance in IMR with smoking be the only of the three that significantly contributed.

Poster: 43

Brenna Lammers

The Relationship between Upstream Variables and Diabetes in Ohio

Mentor: *Jeannette Manger, Ph.D. and Amber Todd, Ph.D.*

Department: Medical Education

Abstract: Chronic illness is a significant contributor to disease burden in the US. Among these chronic conditions, diabetes is one of the most prevalent. Knowing the relationships between various factors and the prevalence of diabetes would be beneficial to creating targeted approaches to address this major public health problem. Therefore, the objective of this project was to elucidate the relationship between social determinants of health (unemployment, food environment index, and access to exercise opportunities) and access to care variables (ratio of population to primary care physicians and percent uninsured) with prevalence of diabetes by county in Ohio. This was done through Spearman correlation statistical analysis of data collected from the CDC County Health Rankings and Roadmaps Database. Results showed a weak negative correlation between diabetes prevalence and access to exercise, and a weak positive correlation between diabetes prevalence and percentage uninsured and PCP (primary care provider) ratio. Diabetes prevalence showed no correlation to food environment index. Results showed a moderate positive correlation between unemployment rates and diabetes prevalence. Additionally, a linear regression was performed to determine how well the selected social determinant of health and access to care variables accounted for the observed variance in diabetes between counties. The stepwise regression showed that the model was significant with percent unemployment having the greatest contribution to the observed variance in diabetes prevalence. Access to exercise opportunities was also found to have a significant contribution to the best model. Key Words: Diabetes, Access to Care, Social Determinants of Health

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Poster: 44

Judith Mathess and Maria Labello

Patient Satisfaction With Perinatal Telehealth Visits During the COVID-19 Pandemic

Mentor: *Marilyn Kindig, D.O.*

Department: Obstetrics and Gynecology

Abstract: Background: During the COVID-19 pandemic, the format of healthcare delivery was altered. Out of an attempt to decrease transmission of the virus, virtual care visits increased during the pandemic. The Department of Health and Human Services reported a 63-fold increase in the number of Medicare virtual visits from 2019 to 2020.1 In the field of obstetrics and gynecology, prenatal care was especially affected in the early pandemic when little information regarding the COVID-19 virus was available. In the United States, prenatal visits for uncomplicated pregnancies are scheduled every 4 weeks until 28 weeks gestation, every 2 weeks from 28 to 36 weeks, and then once a week until delivery.2 Out of necessity and desire to decrease transmission risk, telehealth and virtual visits were incorporated into routine prenatal care. With this transition, concerns regarding adequate care, patient satisfaction, and safety arose. We conducted a survey to address these patients' concerns. Methods: An online survey was conducted with adult patients who had an obstetric virtual visit during the pandemic. Patients were recruited through the email associated with their electronic medical records. We present descriptive statistics from the survey data (n = 72), using a framework of satisfaction with telemedicine from the patient's perspective. Results: Overall, patients reported high satisfaction with obstetrics telehealth during the pandemic. Patients retained access to prenatal care without having to consider the risk of COVID-19 infection. Patients reported that their concerns were adequately addressed, their privacy was protected, and that they felt safe during their telehealth appointment. Patients also reported that telehealth was convenient and cost-effective. A majority of patients preferred in-person appointments, but most reported

that they would recommend the use of telemedicine visits to others, as well as schedule another virtual visit for themselves. Conclusion: As a physical examination, procedures, ultrasounds, and laboratory work are not required at all prenatal visits, we propose that patients be given the opportunity to choose virtual visits as the method of healthcare delivery. As virtual appointments do not require taking time off of work and transportation, this may remove barriers to receiving prenatal care, especially those associated with socioeconomic status.

Poster: 45

Anh Nguyen and Grace Owens

Prevalence of firearm ownership in Wright State Physicians patients and attitude toward firearm safety screening

Mentor: *Katharine Conway, M.D., M.P.H., and Paul Hershberger, Ph.D.*

Department: Family Medicine

Abstract: Introduction: This project studied the prevalence of firearm ownership in the patient population at Wright State Physicians (WSP) and assessed the portion who are high-risk firearm owners. Background: In the Midwest United States, 50% of adults report living in a gun household. Sixty percent of deaths by firearms are due to suicide. Safety practices such as storing a firearm unloaded and locked are promoted by multiple organizations though not universally applied by firearm owners. Certain populations in the U.S. are at higher risk for firearm-related injury and fatality such as children, veterans, people with a history of depression, previous suicide attempts, post-traumatic stress disorder, substance use disorder, cancer diagnosis, neurocognitive disease, or significant physical disability. Opportunities exist to screen patients who may live in a high-risk gun household, similar to demonstrated successful health-care related screenings which already exist, such as alcohol use. Recommending storing firearms safely and educating patients about gun-safety practices is effective in increasing safe gun storage behaviors. Methods: The study protocol was reviewed by WSU IRB and determined to be exempt. Patients filled out paper surveys about firearm ownership and willingness to discuss firearms safety with healthcare professionals. Data were then collated and analyzed in REDCap and with SAS version 9.4. An alpha of .05 was used to determine statistical significance. Descriptive statistics were conducted with means, medians, standard deviations, and ranges for all continuous variables and frequencies and percentages for all categorical variables. Results: 160 surveys were collected. The average age was 47; 80% identified as white and 40% were male. 41% of respondents owned firearms; 76% stored their firearms locked, and 60% stored them unloaded. Close to 50% stored their firearms in the safest way (firearms locked and unloaded) and 16% stored them in the least safe way (firearms unlocked and loaded). There was no gender difference in who was likely to have at least one firearm safety measure in place or willingness to discuss firearm safety practices. 1 in 2 firearms owners reported that they are willing to discuss firearm storage practices with physicians. Among those who do not already store their gun locked, 50% were either very or somewhat unwilling to do so. Similarly, 60% were either very or somewhat unwilling to remove ammunition from their firearms and 73% were very unwilling to remove firearms from their home. In terms of risk factors, 26% of the firearm owners reported having a male over 65 living in their homes. 32% reported having children living in the home, 12% of them had their firearms locked and unloaded and 2% have their firearms unlocked and loaded. 21% of firearm owners had a history of depression and 2% of them stored their firearms in the least safe way. Conclusions: Even though 1 in 2 firearm owners was willing to discuss firearm practices with their physicians, they were less willing to change their storage practices. Tools like motivational interviewing and providing information about how to prevent accidental firearm injuries with safer storage practices can help increase patients' willingness to change. There is also a need for a validated tool that can be used to screen for patients at higher risks of firearm injury and death in a primary care setting.

Poster: 46

Temitope Omoladun

Disparities in Health Care Utilization and the Effect of Family Resilience and Neighborhood Support

Mentor: *Nora Vish, M.D.*

Department: Dayton Children's Hospital

Abstract: Resilience, the ability to recover from adversity, can mitigate the negative outcomes associated with external drivers of health. Medical homes work to establish partnerships of responsibility and trust between physicians and families to promote well-being. This study assesses the association between family resiliency, neighborhood support and how healthcare is accessed. Methods: Data for children aged 4-17 years were drawn from the 2016-2017 National Survey of Children's Health, which sampled households in all 50 states. The effects of family resilience and neighborhood support were determined for 3 negative health care outcomes: not having a usual place for sick care, not receiving care through a medical home, and ≥2 emergency department (ED) visits in the past year. The constructs of family resilience, neighborhood support and medical home were assessed by ordinal responses to a series of statements of how a family faces problems, neighborhood support, and how care is received respectively. Multiple logistic regression with weighting was used to determine adjusted odds ratios and 95% confidence intervals for the effects of family resilience, neighborhood support on health care outcomes, controlling for child's age, sex, race, health insurance, parent education, family structure and income. Children with special health care needs (CSHCN) were identified by CSHCN screener to adjust for their complex needs and high utilization. Results: 58,336 children aged 4-17 years (51% male), representing a weighted sample of 57,688,434 were included. Overall, 8.0%, 13.1% and 78.9% lived in households identified as low, moderate and high resilience respectively. 56.1% identified their neighborhood as supportive. Of outcomes measured: 21.8% of children did not have a usual place for sick care, 52.5% did not receive care in a medical home, and 4.2% had ≥2 ED visits in the past year. High and moderate family resilience, and a supportive neighborhood were protective against not receiving care in a medical home but were not associated with a usual place of sick care or ≥2 ED visits (Table). Caregiver education less than a college degree, Black race, income below poverty level, two unmarried parents, and CSHCN were associated with all outcomes. Discussion Family resilience and neighborhood support have a protective effect on a child's use of a medical home, even after controlling for multiple factors. This study emphasizes a possible mechanism by which resilience and neighborhood support may mitigate health care disparities.

Poster: 47

Brooklynne Dilley and Samantha Roberts

Childhood Underinsurance During the Covid-19 Pandemic

Mentor: *John Pascoe, M.D., M.P.H.*

Department: Pediatrics

Abstract: Background: Health insurance makes an important contribution to children's health. However, having health insurance does not always give children access to quality health care. Earlier work has found no effect of the Affordable Care Act on children's underinsurance status in southwestern Ohio. This study examines childhood underinsurance in southwestern Ohio during the COVID-19 pandemic. Objective: To document the prevalence and correlates of children's underinsurance during the COVID-19 pandemic. Design/Methods: This is a cross sectional study of a convenience sample of children being seen in primary care practices within the Southwestern Ohio Ambulatory Research Network (SOAR-Net). Study parents were recruited in the waiting rooms of participating SOAR-Net pediatric practices from June through November 2021. Respondents completed the Medical Expenses of Children Survey that has been employed in similar research since 2009. Index children were considered underinsured if their parents responded "yes" to at least one of six questions

regarding inability to pay for a pediatrician's recommendation despite the child having health insurance. Children were eligible between the ages of 6 months and 18 years. This analysis focused solely on index children's parents. Results: 394 caregivers were approached in waiting rooms of SOAR-Net practices. The response rate was 83%. This analysis focused on the 300 parents who completed the survey. 83% of respondents were the index child's mother, more than three quarters (78%) were white, and 71% were married. About 43% had a college degree, and over 57% of respondents reported annual income of at least $50,000. Children's mean age(N=293) was 8.9 (5.3) years. 14% of index children were underinsured. This is a similar prevalence compared to earlier studies using identical survey questions. Almost half (46%) of parents raising underinsured children reported that it was harder to access care for their child compared to 3 years ago, while only 6% of parents raising adequately insured children reported it was harder (p< 0.001). COVID-19 was more likely to have a negative effect on underinsured children's mental health (60%) compared to adequately insured children (33%, p=0.001). Conclusions: About one in six children remain underinsured in southwestern Ohio. Almost one half of parents of underinsured children report it is harder to access care for their child in 2021 compared to three years earlier, and the majority of parents of underinsured children report the pandemic has had a negative effect on their children's mental health. Further research should continue to examine factors related to underinsurance as many families struggle to raise their children during the COVID-19 pandemic.

Poster: 48

Samantha Roberts and Brooklynne Dilley

Children and COVID-19: A Primary Care Perspective

Mentor: *John Pascoe, M.D., M.P.H.*

Department: Pediatrics

Abstract: Background: The COVID-19 pandemic has had a significant negative impact on many children and their families. This study documents several aspects of parents' perspectives of COVID-19's putative effects on children and their families. Settings and participants: Study surveys were completed by parents/guardians of index children as they visited their administered as children and parents visited their child’s primary care pediatrician at practices within the Southwestern Ohio Ambulatory Research Network (SOAR-Net), a primary care child health research network located in the Miami Valley of Ohio. Methods: This is a cross sectional study of a convenience sample of children being seen in SOAR-Net primary care practices. Study parents were recruited in waiting rooms of participating SOAR-Net practices from June-November 2021. Results: 394 caregivers were approached in waiting rooms of SOAR-Net practices. Response rate was 83%. This analysis focused on 300 parents who completed the survey. 83% of respondents were the index child's mother, 78% were white, and 71% were married. The majority (57%) reported annual household income of at least $50,000. Index children's mean age was 8.9 (5.3) years. Almost half (49%) of families with annual income <$50,000 reported that the pandemic had a negative effect on income, compared to only 12% of higher income families (p< 0.001). One half of index children were vaccinated or very likely to be vaccinated. The majority (55%) of study parents were vaccinated against COVID-19 parents (55%), and they were far more likely to vaccinate their children compared to AOR=7.6 (95% CI 4.1-14.1) than unvaccinated parents AOR=7.6 (95% CI 4.1-14.1). More elementary aged children had school performance negatively affected (56%) compared to middle or high school students (42%, p=0.044). Over one third (37%) of parents reported the pandemic had a negative impact on their children's mental health, and 40% reported a negative effect on school performance. However, about 69% of index children with mental health struggles also had school performance issues, compared to only 31% of index children with no mental health struggles (p< 0.001). About 15% of index children had been infected with COVID-19. Index children's school performance was not related to whether or not they had COVID-19

infection (p>0.05), but 52% of index children who had COVID-19 had mental health struggles compared to 35% of children who had not had COVID-19 (p=0.033). Conclusions: The COVID-19 pandemic has had an adverse effect on family finances and children's mental health for many children/families seen in primary care settings. Vaccination status of parents was strongly related to vaccination status of index children. School performance of elementary school aged children was more likely to be adversely affected by the pandemic than middle or high school students, and childhood infection by COVID-19 was not related to school performance but was related to children's mental health. Future research should examine the longitudinal effects of COVID-19 on children and their families.

Poster: 49

Ibrahim Alkhomsi and Brooklyn Morris

Generating heart specific lipin-1 deficient mouse model

Mentor: *Hongmei Ren, Ph.D.*

Department: Biochemistry and Molecular Biology

Abstract: Lipin1 functions as phosphatidic acid phosphatase that are required for lipid synthesis and also acts as transcriptional coactivators of PPARs that regulate fatty acid oxidation. It converts phosphatidic acid to diacylglycerol (DAG). DAG is an important molecule that participates in phospholipid biosynthesis. The loss of lipin-1 PAP activity in fld mice contributes to failure of adipose tissue to store lipids and cause lipodystrophy. In contrast, enhanced lipin-1 expression targeted to adipose tissue in transgenic mice results in obesity. Our data shows that lipin-1 protein and mRNA expression levels are significantly reduced in the cardiac muscle of the mdx mouse model of DMD. In addition, in the recently regenerated mdx:lipin transgenic mice, overexpression of lipin-1 in dystrophic heart reduced inflammation, necroptosis and fibrosis in the myocardium. Understanding the role of lipin1 in DMD patients is crucial which could improve the cardiac function in those patients. However, the function of lipin1 in heart muscle is not fully understood, our genotyping experiments allow us to identify the correct genotyping for the heart specific lipin1 deficient mice by developing a mouse model where lipin1 is depleted in heart muscle. We experimented with different PCR annealing temperatures and have chosen the correct primers to have a clear image for the genotyping between homozygous and heterozygous mice groups.

Poster: 50

Abdullah Alshudukhi

Lipin1 ameliorates dystrophic phenotypes in mdx mice via enhancing membrane integrity

Mentor: *Hongmei Ren, Ph.D.*

Department: Biochemistry and Molecular Biology

Abstract: Duchenne muscular dystrophy (DMD) is a severe muscular disease characterized by a progressive muscle fiber loss. DMD affects approximately 1 in 5000 male births worldwide. Patients die at early age due to impaired respiratory and cardiac functions. Currently, effective therapies for DMD have not been established. DMD is caused by mutations in dystrophin gene. Dystrophin is known to strengthen and protect myofibers membrane from tearing during contractions. Dystrophin mutations in DMD lead to disruption of the membrane integrity and necroptosis in DMD patients. Increased rate of muscle damage and cell death are linked to defects in the myofiber membrane which activate necroptosis. This necroptosis is reported in literature to be mediated mainly by Ripk3, a key mediator of necroptosis. Since gene therapies using dystrophin gene are not feasible for most cases of DMD patients the goal of this project is to find a potential therapeutic target which may improve muscle function/structure despite dystrophin deficiency. Our preliminary data show that lipin1 expression was significantly downregulated in mouse model of DMD (mdx mice). Lipin1 is an enzyme that generates

diacylglycerol (DAG) and acts as a transcriptional coactivator for PPARs. Lipin1 mutations were reported in patients with acute recurrence rhabdomyolysis. We have shown in a recently published work that lipin1 may play an important role in stabilizing the membrane integrity in the skeletal muscle since muscle-specific lipin1 null mice have impaired membrane integrity and enhanced muscle fiber degeneration. We hypothesized that overexpression of lipin1 gene in the skeletal muscles of mdx mice improves membrane integrity and reduces necroptosis in mdx mice through its phosphatidic acid phosphatase (PAP) activity or its nuclear function. The objective of this study is to determine the effect of overexpressed lipin1 in strengthening muscle membrane integrity in mdx mice through its PAP activity. To that end, lipin1 will be delivered to gastrocnemius (GAS) muscles of mdx mice via injecting a virus carrying Lpin1 gene (AAV-vector) or lipin1 mutants.

Poster: 51

Mashael Alyahya

Replication Stress Induced by the Ribonucleotide Reductase Inhibitors Guanazole, Triapine, and Gemcitabine in Schizosaccharomyces Pombe

Mentor: *Yong-jie Xu, M.D., Ph.D.*

Department: Pharmacology and Toxicology

Abstract: Introduction: Replication stress can be produced by various exogenous or endogenous factors that perturb the movement of replication forks. To overcome the stress, cells provoke the DNA replication checkpoint (DRC) that mobilizes several pathways to protect the forks, maintain the genome integrity, and promote cell survival. Although the replication checkpoint is crucial for genome integrity in all eukaryotes, the underlying mechanisms remains to be fully understood. To investigate the mechanisms of DRC, hydroxyurea (HU), an established inhibitor of ribonucleotide reductase (RNR), has been widely used in laboratories as an inducer of the replication stress. However, HU targets other cellular components than RNR, which may complicate the checkpoint studies, leading to ambiguous description of the checkpoint mechanisms. The aim of this study is to find an RNR inhibitor that produces the replication stress more specifically than HU by examining guanazole (GZ), triapine (3-AP), and gemcitabine (GEM) under several experimental conditions. Methods: The sensitivity of S.pombe to the tested drugs was determined by chronic and acute spot assays, and the cell recovery assay. The effect of the selected drugs on the DRC signaling pathway was analyzed via measuring the protein and the phosphorylation levels of the checkpoint mediator Mrc1 by Western blot. Cell cycle analysis was performed by flow cytometry. The effect of the drugs on mutants with defective DRC was examined under microscope for the presence of cut phenotype. Results: We found that GZ and 3-AP produce the replication stress more specifically than HU under the chronic drug exposure conditions. Under acute drug treatment conditions, however, GZ causes other intracellular stress. Cell cycle analysis revealed that when GZ is used in high concentrations, the majority of S. pombe cells were arrested at the G2/M phase, not at S-phase. The microscopic examination did not show the cut phenotype in GZ-treated cells suggests that the G2/M arrest prevents rad3Δ cells from undergoing a mitotic catastrophe. Discussion: Replication stress is unavoidable in all proliferating cells that activates the DRC to maintain cell health and survival. Since HU triggers cellular stress responses other than replication stress, we tested other RNR inhibitors to find a specific replication stress inducer. GEM did not show any cytotoxic effect. It could be because S.pombe lacks either the transporter for its influx or the nucleoside kinase which convert GEM into its active metabolites. While 3-AP showed a cytotoxicity under chronic conditions, it was not effective under acute treatment. IT is likely due to its bulky structure or its hydrophilicity that hinders it from penetrating the cell wall in a short time. GZ is the only drug that exhibits both chronic and acute sensitivity. However, it arrests majority of the tested cells in G2/M, not S phase, which strongly suggests a side effect of GZ which may function similarly as the DNA damage checkpoint when used in high concentrations. Therefore, we propose that employing GZ for producing the replication stress under

chronic conditions and HU for inducing acute replication stress would supplement each other and benefit the checkpoint research.

Poster: 52

Sankhadip Bhadra

Role of TTT complex in regulating DNA replication checkpoint in fission yeast

Mentor: *Yong-jie Xu, M.D., Ph.D.*

Department: Pharmacology and Toxicology

Abstract: Background: DNA replication can be perturbed by hydroxyurea (HU) that depletes dNTPs and the DNA damaging agents such as methyl methanesulfonate (MMS) that damage DNA templates. These agents stall replication forks, causing replication stress. If undetected, stalled forks collapse, causing mutations or cell death. In response to the stress, the cell activates the replication checkpoint controlled by the protein kinases ATR and ATM. ATR and ATM are members of the phosphatidylinositol-3-kinase (PI3K) family and their maturation and stability are regulated by TTT (Tel2-Tti1-Tti2) protein complex. The TTT interacts with R2TP (Rvb1-Rvb2-Tah1-Pah1) co-chaperone and the PI3K kinases for their proper folding and assembly. Methods: A genetic approach was used to screen for Tti1 mutants through random mutagenesis followed by integrating these mutations in the yeast genomic locus via pop-in/pop-out recombination strategy. The sensitivity of the selected mutants to either HU or MMS or both was phenotypically determined by chronic spot assay. Western blot analysis was performed to study the effect of these mutants on checkpoint signaling at the molecular level by measuring the phosphorylation of the checkpoint sensor kinases Mrc1 and Chk1. Finally, mutants with defects in checkpoint, especially in the presence of HU was determined by the presence of cut phenotype under the microscope by Hoechst and Blankophor staining. Discussion: The current model demonstrates the upstream regulation of Rad3 (ATR) by the TTT complex. Recent studies in our lab have identified a tel2 mutation tel2-C307Y that eliminates Rad3 (ATR ortholog)-mediated replication checkpoint signaling in the fission yeast Schizosaccharomyces pombe. Surprisingly, although the Rad3-mediated replication checkpoint signaling is eliminated by the mutation, the Rad3-mediated signaling in the DNA damage checkpoint pathway is only moderately reduced, suggesting that in addition to Rad3 maturation, Tel2 may contribute to the replication checkpoint via a previously unknown mechanism in fission yeast. To better understand the checkpoint mechanisms, we are using a genetic approach to analyze the functions of Tti1, the largest component of the TTT complex. Our preliminary data show that it is likely that new separation- of-function mutants of tti1 in the DNA replication checkpoint and the DNA damage response have been identified which suggests that the TTT complex might also regulate the downstream checkpoint signaling pathway.

Poster: 53

Scout Bowman-Gibson and Bryce Linkous

Placental-specific transcriptomics of preeclamptic pregnancies with increased adiposity

Mentor: *Thomas L. Brown, Ph.D.*

Department: Neuroscience, Cell Biology and Physiology & Obstetrics and Gynecology

Abstract: Background: Preeclampsia affects 5% to 7% of all pregnancies and is responsible for over 70,000 maternal deaths and 500,000 fetal deaths worldwide, every year (Hogan et al. 2010, Kuklina et al. 2009, Wanderer et al. 2013). It is a leading cause of maternal and fetal death (Chappell et al., 2008). The devastating outcomes associated with preeclampsia underscore the dire need for noninvasive diagnostic techniques for early identification of at-risk pregnancies. Extracellular vesicles (EVs) are secreted by various tissues throughout the body. Encased by a lipid bilayer as they bud off of the plasma membrane. EV are capable of avoiding enzymatic destruction as they transport their cargo into the maternal circulation (Salomon et al., 2017; Kupper

and Huppertz, 2021; Burkova et al., 2021). EVs increase in pregnant women and those originating from placental trophoblast cells have demonstrated angiogenic and oxygen-sensing functionality through the delivery of specific proteins, DNA, messenger RNA (mRNA), and microRNA (miRNA) (Yang et al., 2019; Matsubara et al., 2021). miRNAs are small noncoding RNA fragments capable of binding to the 3' end of mRNA in order to regulate protein translation (Valadi et al., 2007). In response to inflammation or hypoxic challenge, the placenta can differentially release miRNAs to regulate target maternal gene expression (Cai et al., 2017). The deregulation of miRNA expression has been implicated in the endothelial dysfunction that contributes to the development of preeclampsia (Pillay et al., 2017; Hornakova et al., 2020). Increased adiposity (IA30), i.e., a body mass index (BMI) of greater than 30 kg/m2, is a significant risk factor for developing preeclampsia (Roberts et al. 2011; Spradley et al., 2015). EV secretion in pregnant IA30 patients is significantly higher than in normal pregnancy. In this study, we will analyze the transcriptomic profiles of placenta-derived EVs collected from plasma early in gestation. We will compare these EVs to the placental tissue collected at birth in preeclamptic IA30 patients and then compare those to uncomplicated pregnancies to identify predictive biomarkers that can be used for early diagnosis. Methods: Patients with singleton pregnancies will be identified for sample collection based on a rigorous set of inclusion/exclusion criteria. Maternal pre-pregnancy BMI must be greater than 30 kg/m2 to qualify for study participation, and patients with chronic medical conditions such as diabetes, preexisting hypertension, or renal dysfunction will be excluded. Ten milliliters of blood will be drawn between 26 to 34 weeks of pregnancy and immediately centrifuged to obtain patient plasma samples. Plasma will be stored at -80°C before purification and analysis. EVs will be isolated from plasma according to the manufacturer’s protocol (ExoQuick Ultra, System Biosciences) and confirmed by TSG101 and CD63 positivity. Western blot analyses of plasma-derived EV samples derived from the placenta will be determined by placental alkaline phosphatase (PLAP) and human leukocyte antigen-subtype G (HLA-G). Placental samples will be collected immediately upon delivery. Approximately 1 cm3 of tissue will be excised from four quadrants of the maternal surface and stored in RNAlater for transcriptomic analysis. miRNAs isolated from a patient's placental tissue will be analyzed in parallel to the those isolated from their plasma-derived extracellular vesicle by RNA-Seq.

Poster: 54

Alexandra Brown

Effects of Lipin1 Deficiency and Overexpression in the Dystrophic Diaphragm

Mentor: *Hongmei Ren, Ph.D.*

Department: Biochemistry and Molecular Biology

Abstract: Duchenne Muscular Dystrophy (DMD) is an X-linked recessive disorder that is characterized by severe and progressive muscle wasting. This disease is caused by a mutation in the largest known human gene which encodes the protein, dystrophin. Dystrophin connects the inner cytoskeleton to the extracellular matrix and is critical for maintaining the structural stability of muscle cells during contraction. Mutations to the dystrophin gene result in myocyte membrane instability, contributing to the structural deterioration of the muscle tissue. Progressive muscle degeneration and the replacement of muscle fibers with fibrotic tissue negatively impacts muscle contractility and is particularly detrimental to health when essential muscles such as the diaphragm are affected. Respiratory failure is a hallmark of DMD and is one of the leading causes of mortality associated with this disease. Currently there is no cure for Duchenne Muscular Dystrophy, and gene therapy approaches are limited by the sheer size of the dystrophin gene which spans across 2,200 kb of DNA. Previous data generated from the laboratory has shown that the mdx mouse (used to model DMD) displays reduced expression of Lipin1. Additionally, other works have shown that skeletal muscle specific Lipin1 knockout mice present muscle membrane instability. Collectively, these findings suggest the potential for Lipin1 to serve as an alternative

therapeutic target in the dystrophic diaphragm. Within the membrane of the endoplasmic reticulum, Lipin1 functions as a phosphatidic acid phosphatase (PAP), which catalyzes the conversion of phosphatidic acid (PA) to diacylglycerol (DAG), a reaction important for membrane phospholipid and triacylglycerol synthesis. Current data suggests further knockdown of Lipin1 in the dystrophic diaphragm leads to increased necroptosis and fibrosis, as well as reduced muscle regeneration. Overexpression of Lipin1 in the dystrophic diaphragm results in reduced inflammation, fibrosis, and degeneration/regeneration cycling of muscle fibers. Additionally, respiratory functionality assays have shown decreased respiratory function when Lipin1 is further knocked down but improved respiratory function when Lipin1 is overexpressed in the dystrophic diaphragm. Continued investigation is required to better understand the mechanisms behind these findings, and to determine the role of Lipin1 in maintaining muscle membrane stability.

Poster: 55

Reid Fursmidt

Evaluating the in vitro efficacy of bovine lactoferrin products against SARS-CoV-2 variants of concern

Mentor: *Jonathan Sexton, Ph.D.*

Department: Medicinal Chemistry

Abstract: Bovine lactoferrin (bLF), a naturally occurring glycoprotein found in milk, has bioactive characteristics against many microbes, viruses, and other pathogens. Bovine lactoferrin strongly inhibits SARS-CoV-2 infection in vitro through direct entry inhibition and immunomodulatory mechanisms. This study reports on the anti-SARS-CoV-2 efficacy of commercially available bLF and common dairy ingredients in the human lung cell line H1437 using a custom high-content imaging and analysis pipeline. We also show for the first time that bLF has potent efficacy across different viral strains including the South African B.1.351, UK B.1.1.7, Brazilian P.1, and Indian Delta variants. Interestingly, we show that bLF is most potent against the B.1.1.7 variant [half-maximal inhibitory concentration (IC50) = 3.7 μg/mL], suggesting that this strain relies on entry mechanisms that are strongly inhibited by bLF. We also show that one of the major proteolysis products of bLF, lactoferricin B 17–41, has a modest anti-SARS-CoV-2 activity that could add to the clinical significance of this protein for SARS-CoV-2 treatment as lactoferricin is released by pepsin during digestion. Finally, we show that custom chewable lactoferrin tablets formulated in dextrose or sorbitol have equivalent potency to unformulated samples and provide an option for future human clinical trials. Lactoferrin's broad inhibition of SARS-CoV-2 variants in conjunction with the low cost and ease of production make this an exciting clinical candidate for treatment or prevention of SARS-CoV-2 in the future.

Poster: 56

Abdulrahman Jama

The Role of Lipin1 in Skeletal Muscle of MDX mice

Mentor: *Hongmei Ren, Ph.D.*

Department: Biochemistry and Molecular Biology

Abstract: Duchenne muscular dystrophy (DMD) is a genetic disorder inherited through X-linked manner affecting 1 in 3500 male births. It is characterized by mutations on the dystrophin gene which leads to the loss of functional dystrophin protein. The dystrophin protein is part of a complex of proteins that stabilizes the skeletal muscle membranes due to mechanical stress exerted by movements. Lack of dystrophin leads to membrane tear and damage leading to muscle death through necroptosis. Currently there are no effective treatments for the DMD patients. Lipin1 is a phosphatidic acid phosphatase that converts phosphatidic acid (PA) to diacylglycerol (DAG). DAG is an important molecule that participates in phospholipid biosynthesis. Preliminary data from our lab shows that lipin1 expression, both at the protein and mRNA level, is

downregulated in Mdx mice, the DMD mice model. Ablating the remaining Lipin1 levels by generating double knockout mice mdx/lipin1-/-, our lab seeks to understand the role of lipin1 in DMD.

Poster: 57

Shaina Ailawadi and Raghav Talreja

Titanium dioxide and zinc oxide nanoparticles in sunscreens: impact on cytokine expression in human skin post-UVB exposure

Mentor: *Courtney Sulentic, Ph.D.*

Department: Biochemistry and Molecular Biology

Abstract: Nanoparticles (NP) have recently been widely used in sunscreen products to prevent UVB-mediated skin damage. Research has shown that Zn and TiO2 NP effectively scatter, reflect, and absorb light in the UV range. However, there is little research on the impact of UVB exposure with or without NP therapy related to inflammatory cytokine expression. This study investigates the influence of ZnO and TiO2 NP on the expression of pro- and anti-inflammatory cytokines in the setting of UVB radiation on in-vivo human skin samples. Three human skin explants obtained post-surgically were treated as follows: UVB alone (control), ZnO or TiO2 NP with or without UVB, and ZnO/TiO2 combination therapy with UVB exposure. Samples were analyzed with BioRad Bio-Plex Pro Human Cytokine 27-plex Assay to determine cytokine expression of: IL-1β, IL-1RA, IL-6, IL-8, IL-15, FGF basic, Eotaxin, GM-CSF, IFN-γ, MCP-1, MIP-1β, RANTES, TNF-α, and VEGF under various experimental conditions. Our preliminary analysis of results confirms previous research suggesting a baseline increase in pro-inflammatory cytokines when skin is exposed to UVB, Zn or TiO2 NP. We also found that baseline inflammation with NP-only treated samples is generally higher than UVB exposure alone. Interestingly, some inflammatory cytokines were synergistically increased with either NP application before or after UVB exposure. These results suggest a potential for NP sunscreen and UVB exposure to induce inflammation and supports further studies to evaluate the safety and efficacy of using NP sunscreens.

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