

**Twenty Second Annual
Medical Student
Research Symposium**



**Pinn Hall
University of Virginia School of Medicine
November 10, 2023
12:00-2:30 PM**

Presentations

Presentation	Presenter/title
1	Abduhalikov, Timour - Narrative Medicine Workshop for Preclinical Medical Students Pilot Project
2	Almario, Nate - Mean Time to Lesser Toe Amputation Following Great Toe or First Ray Amputation
3	Baiocco, Christopher - Social Media Usage in Patients with Hand and Upper Extremity Conditions
4	Barakat, Nadim - Causal Language in Observational Rotator Cuff Database Studies Published From 2013-2022
5	Boyapati, Rohan - Dysphagia and Associated Mortality in the Hip Fracture Population Receiving Surgical Treatment
6	Carter, Caroline - Evaluation of Left Ventricular Longitudinal Strain by Cardiac Magnetic Resonance in Known and Suspected Ischemic Heart Disease
7	Chipoletti, Ashley - Correlates of Cannabis and Opioid Craving Among Patients with Chronic Pain
8	Choi, Janice - Using peripheral nerve stimulation to treat neuropathies of the upper extremity: a systematic review
9	Choudhary, Fatima - Longitudinal Outcomes of Successive Aortic Operations in Connective Tissue Disease Patients
10	Cios, Krystyna - Utility of Tilt Table Testing in Management of Seizure-like Activity after Inconclusive Epilepsy Monitoring Unit Admission
11	Condlin, Emily - Black Widow Spider Envenomation: A Review of National Data
12	Cook, William - Evaluation of Weekend Operating Room Delays at a Level 1 Trauma Center: A One-Year Retrospective Analysis
13	Cotton, Caroline - B-scan Ultrasonography Findings in Patients with Endophthalmitis and Associated Visual Outcomes
14	Crites, Sean - Evaluation of Pediatric Food Bank: Addressing Food Insecurity and Nutrition in an Academic Pediatric Outpatient Clinic

Presentation	Presenter/title
15	Denhard, Kelly - Dexamethasone impact on respiratory status and heart rate variability in preterm very low birth weight infants
16	D'Ovidio, Christina - Gender Expansive Population in the University of Virginia Pediatric Endocrinology Department and Teen and Young Adult Health Center
17	D'Silva, Susanna - Building a Time Depend Predictive Model for Lymphopenia after Radiation Therapy for Pancreatic Cancer
18	Dupre, Abigail - Neutrophil Extracellular Traps Accelerate Nonalcoholic Steatohepatitis Fibrosis by Modulation of Hepatic Stellate Cells
19	Esrig, Ari - Stool Sphingomyelin Analysis to Predict Parenteral Nutrition-Associated Cholestasis in Very Low Birth Weight Neonates
20	Farmer, Ryan - Communicating Uncertainty in Patient Handoffs
21	Florenzo, Brian - Dermatology Resources in the Latinx Community in Charlottesville
22	Gaston, Brayden - Evaluating Patient Demographics and Physical Activity Guidance in Annual Check-ups with Primary Care Physicians
23	Ghenbot, Rahwa – Promoting Health Equity in The University of Virginia Health System Patient Population
24	Goudarzi, Ariaz - Efficacy of Radial versus Femoral Access in Thrombectomy Procedures
25	Harrelson, Hannah - Lung Cancer Screening Uptake in a Non-Profit Federally Qualified Health Center
26	He, Britney - Trends in nipple-sparing mastectomies among individuals with breast cancer: a retrospective cohort from a tertiary academic center, 2014-2020
27	He, Xin - Qualitative Analysis of the Barriers to Inmate Access to Medical Care in the Virginia Correctional System
28	Holum, Parker - The Controversial Presentation of the Kidney by Andreas Vesalius

Presentation	Presenter/title
29	Johnson, Anna - The Effect of Patient Resources on Outcomes in Autologous Breast Reconstruction: A Single Center Matched Cohort Study
30	Kabir, Farah - Dietary Methionine and Homocysteine Level Interaction with Recurrent Stroke
31	Karri, Vishnusai - Multimodal Evaluation of VEGF-induced Ocular Pathology
32	Kartchner, Cate - Outcome of Large Vessel Occlusions in Frail and Non-frail Patients: A Comparative Analysis
33	Ke, Benjamin - The Effect of Pre-operative Exercise on Immune Cell Trafficking in Liver Metastases
34	Kirkpatrick, Summer - Methods to Evaluate Vascular Effects of Cocoa Flavanols on Calf Muscle Perfusion in Patients with Lower Extremity Peripheral Artery Disease
35	Kopp, Emily - Venous Thromboembolism Risk Stratification in Patients with WHO Grades 3 & 4 Diffuse Gliomas
36	Lain, William - Kinetics of enteric pathogen quantity during acute diarrhea in children in resource-limited settings by quantitative PCR
37	Le, Royce - Magnetic Resonance Imaging versus Diagnostic Arthroscopy to Identify Intraarticular Pathology Associated with Patellar Instability: A High Rate of Discordant Findings Altering Surgical Treatment
38	Lee, Manny - Utilizing Bayesian Machine Learning to Identify Predictive Features of Recurrent Clostridioides Difficile Infection
39	Lefbom, Lucie - Endocrine therapy and ovarian suppression approaches for risk reduction among premenopausal women with hormone positive breast cancer following mastectomy
40	Lewis, Jonah - Primary Care Provider's Approaches to Diagnosis and Therapy of Adults with Attention Issues
41	Lewontin, Myra - Molecular epidemiology and characteristics of shigellosis in the Global Pediatric Diarrhea Surveillance network, 2019-2020
42	Li, Gabrielle - Saving Cells: Retrograde Autologous Priming Reduces Blood Transfusions in Cardiac Surgery

Presentation	Presenter/title
43	Link, Courtney - Referral Patterns to a Gender Clinic
44	Lyons, Catherine - A Rare Case of Vasculitis Induced by Crusted Scabies Infection
45	Marcum, William - Akkermansia Muciniphila as a Prophylactic against Deep Vein Thrombosis in a Murine Model
46	Marino, Loren - Transgender Youth Capacity to Consent to Hormone Based Gender-Affirming Care: A Narrative Review
47	Mathur, Surbhi - Investigating the utility of dual-energy CT in the differentiation of anatomic sites during cancer treatment
48	Mazzoni, Gabrielle - Are Breastmilk Vitamin B3 Concentrations Associated with Childhood Growth and Development?: A Secondary Analysis of the Early Life Interventions in Childhood Growth and Development In Tanzania (ELICIT) Study
49	Mbualungu, James - Impaired Diastolic Function and Cardiorespiratory Fitness in patients with recent ST-Segment Elevation Myocardial Infarction
50	Meyers, Derek - Immunoglobulin G4 (IgG4) & Milk In Vitro Immune Complex Formation
51	Miao, Lucille - How should mindfulness therapy be designed for autistic adults with intellectual disability (ID), according to them and their allies? A qualitative interview study
52	Mullapudi, Abhishek - Analyzing Reasons for Clinical Deterioration Leading to ICU Transfer
53	Murad, Laiba - Recombinant Human Bone Morphogenetic Protein-2 (rhBMP-2) as an alternative to autologous bone graft in pediatric craniofacial reconstruction: A systematic review
54	Murray, Austin - Trends in U.S. Poison Center Data Involving Hallucinogenic Mushrooms
55	Nguyen, Joseph - Impact of closure devices on clinical outcomes following catheter-directed thrombolysis for acute lower extremity arterial occlusions
56	Ott, Garrett - MRI Methods for Quantitative Analysis of the DentatoRubroThalamic Tract in Parkinson's Disease and Essential Tremor treated with Focused Ultrasound (FUS) Thalamotomy

Presentation	Presenter/title
57	Pallinti, Pranavi - Evaluating how design-thinking education fulfills core competencies of medical education
58	Patel, Romil - Approaches to Posterior Fossa Decompressions in Stroke Patients
59	Pazhwak, Bobby - Assessing Primary Care Physicians' Knowledge and Comfort Level Managing Patients Fasting during Ramadan
60	Petrosian, Derek - Novel grading system for CADASIL severity: A multicenter cross-sectional study
61	Purohit, Nidhi - Advancing Interventional Radiology Training through 3D Printed Molds
62	Qiu, Kevin - Controlling the Controller: Identification of Novel Enhancers of the Key Hematopoietic TF PU.1
63	Ranjha, Shahroze - Research Study Characteristics Associated with Media Engagement in Hip and Knee Arthroplasty Database Studies
64	Reddy, Vishal - Investigating Inflammasome Inhibition as a Novel Treatment for Alzheimer's Disease in the 5xFAD Mouse Model
65	Rischie, Ishaan - Cosmetic or Medical Necessity: The Ethics of Hair Removal in the Context of Gender-Affirming Care
66	Royston, Sage - Weight Stigma and Outcomes in Primary Care
67	Schmidt, Michael A - Prescribing Patterns of Prednisone for the Treatment of Sarcoidosis: a single-center retrospective study
68	Senthilvelan, Jayasuriya - Intraoperative Hepatic Perfusion CT for TIPS: A Feasibility Study
69	Shenoy, Arpitha - Association between area deprivation index and premature infant outcomes and follow-up in the NICU.
70	Shetty, Shreya - Quality of Life following Gastric Cancer Surgery

Presentation	Presenter/title
71	Shukla, Anya - The role of periostin in pancreatic ductal adenocarcinoma (PDAC) metastasis
72	Singh, Aditya - Examining interventions that aim to enhance TB treatment adherence in Southeast Asia: A systematic review and meta-analysis
73	Smith, Aaron - A Novel Frameshift Variation in TNFAIP3 Presenting with Acute Liver Failure
74	Spirek, Benton - Longitudinal Physical and Cognitive Outcomes in Pediatric-Onset Multiple Sclerosis (POMS)
75	Tessa Tonleu, Joselyne - Breast-48: High intensity focused ultrasound (HIFU) and Pembrolizumab in metastatic breast cancer
76	Tewari, Anant - Biologically effective dose and prediction of obliteration of arteriovenous malformations in pediatric patients treated by Gamma Knife radiosurgery
77	Venkat, Shreya - Effect of Lactate Transport Inhibition on Hepatocellular Carcinoma Viability in a Woodchuck WHV Model
78	Vithoulkas, James - Pediatric Opioid Exposures in the United States (2012-2022)
79	Wells, James - How Kids Eat: A survey of child and family feeding practices in a rural pediatric population
80	Westlake, Cami - Ironing Out the Details: Does Neisseria gonorrhoeae Acquire Iron from Neutrophils?
81	Whitt, Carley - Improving Management of Clostridioides difficile Infection: A Study of Guideline Adherence and Outcomes
82	Wu, Daniel - Development of an NMT Model to facilitate ICD to AIS translation (PyAIS)
83	Yang, Jack - A Novel Approach to Ablation of Lung Tissue using MRI-guided Focused Ultrasound
84	Zulfiqar, Muhammad - A National PearlDiver Database Analysis of State-Based Differences in Rates of Gender-Affirming Cosmetic and Surgical Procedures for Patients with Gender Dysphoria

Poster #1
Narrative Medicine Workshop for Preclinical Medical Students Pilot Project

Abduhalikov, Timour

Background: The discipline of narrative medicine is predicated on the idea that the skills needed to analyze characters, plot, themes, and language in a work of literature can be used in medicine to better listen to and communicate with patients and thus to tailor person-centered, compassionate care. Our goals were (1) to learn if preclinical medical students would value a narrative medicine workshop involving guided consideration of short fiction with both direct and indirect ties to medicine and (2) to identify areas of improvement for planned future workshops.

Methods: In this pilot project, rising first and second-year medical students participated in a three-part narrative medicine workshop over summer break. They completed an anonymous Google Forms survey with open-ended and Likert scale questions. Responses were reviewed by the authors of this study and our faculty mentor.

Results: Eight of nine participants responded to the survey. They praised the opportunity to have meaningful conversations about life and medicine with their peers in a casual small-group setting. They suggested providing prompts beforehand, including more diverse authors, and giving advance notice of readings to be done outside the sessions.

Discussion: Participants enjoyed the open conversations about life and literature that the workshop setting fostered and took away lessons they feel may prove beneficial to their professional careers. With this input from our pilot participants, we will improve the workshop and ensure that all interested and willing students are able to experience some form of narrative medicine education during their time at UVA SOM.

Poster #2
Mean Time to Lesser Toe Amputation Following Great Toe or First Ray Amputation

Almario, Nate

Background: Diabetes causes significant complications including peripheral neuropathy, which can lead to foot ulceration and amputation. Combined with peripheral artery disease, present in 50% of diabetics, this increases risk of nonhealing wounds. We noticed an increase in lesser digit amputation following great toe and first ray amputation, which we believe is related to contracture of the FDL tendons as the lesser toes attempt to purchase the ground during ambulation. This study measures the mean time between the primary great toe amputation and the secondary lesser digit ulceration or amputation.

Methods: A single center retrospective cohort design was used to identify patients that underwent great toe amputation between July 2017 and June 2023. Utilizing operative notes, 213 patients were identified and subsequently reviewed. Demographic and clinical information including the presence of diabetes mellitus and mortality were gathered using preoperative and postoperative clinic notes to analyze post-surgical outcomes.

Results: Of 213 patients with a first toe amputation, 119 (55.9%) had subsequent ulceration or amputation of the ipsilateral limb. The mean time to second toe ulceration was 323 days and time to amputation was 348.5 days. Mortality among the population with subsequent amputation or ulceration was 26.89 %. The mean A1C for this population was 7.975.

Discussion: The large number of patients with lesser toe ulceration or amputation less than a year from the first toe amputation suggests prophylactic measures are needed. The efficacy of prophylactic surgical intervention such as flexor tenotomy in preventing lesser toe amputation/ulceration should be explored.

Poster #3

Social Media Usage in Patients with Hand and Upper Extremity Conditions

Baiocco, Christopher

Background: In 2022, there were an estimated 302.3 million social media users in the US, 6.77 million more than in 2021 (Statista). As social media platforms continue to grow, so do their applications to healthcare and patient education. This study aims to quantify the use of social media by hand and upper extremity patients and to characterize how social media is used to gather medical information on diagnosis and provider.

Methods: A digital survey was sent to all patients with an activated MyChart account at a single institution hand center. Information on demographics, hand condition, and social media use were collected. Multivariable logistic regression models were used to evaluate the relationship between demographic variables and social media usage.

Results: A total of 316 surveys were completed with a response rate of 6.43%. 241 (76%) patients reported using social media. Of these patients, 34% reported using social media to find information regarding their upper extremity condition and 17% to find information about their surgeon. Multivariable logistic regression revealed that age was inversely related to social media use.

Discussion: Social media platforms are widely used by the hand surgery patient population but less than half of these patients use social media to research their hand surgery diagnoses. As expected, we found that social media usage was age dependent. As social media usage continues to grow and younger generations present with acquired upper extremity conditions, social media may become an increasingly important platform for patient education and healthcare information.

Reference: Statista. Number of Social Media Users in the United States from 2019 to 2028 (in Millions) [Graph]. Statista; 2023. Accessed June 30, 2023.
<https://www.statista.com/statistics/278409/number-of-social-network-users-in-the-united-states/>

Poster # 4

Causal Language in Observational Rotator Cuff Database Studies Published From 2013-2022

Barakat, Nadim

Background: The application of multi-institutional databases in the rotator cuff repair (RCR) literature is growing. Database studies are inherently observational and cannot prove causal relationships, but despite this, authors may use causal language to describe their aims and findings. This study's objective was to quantify the prevalence of causal language and inferences in clinical RCR studies utilizing multi-institutional databases published from 2013 through 2022 across eight orthopaedic journals.

Methods: Clinically oriented RCR studies using multi-institutional databases published in eight orthopaedic journals from 2013-2022 were identified. For the title/abstract and the full text, two blinded reviewers assessed the usage of causal language in each article and assigned a grade of consistently causal, inconsistent, or consistently non-causal based on the extent of causal language utilized. Chi-squared analyses were performed to examine if there was an association between the causality gradings of articles and both the journal and year of publication.

Results: Of 44 eligible articles, 31.8% of both titles/abstracts as well as full texts were graded as consistently causal, 36.4% as inconsistent, and 31.8% as consistently non-causal. Chi-squared analyses demonstrated no statistically significant associations between the journal or year of publication and the title/abstract grade ($p = 0.626$, $p = 0.277$) or the full text grade ($p = 0.374$, $p = 0.822$).

Discussion: More than two-thirds of observational RCR database studies published from 2013-2022 contained causal language and inferences. Authors should avoid using causal language in RCR database studies to reduce the risk of erroneous interpretation of their findings.

Poster #5

Dysphagia and Associated Mortality in the Hip Fracture Population Receiving Surgical Treatment

Boyapati, Rohan

Background: Hip fractures are an increasingly common injury affecting the elderly in the US with 1-year mortality rates as high as 20%. Dysphagia, another common concern in this demographic, can complicate post-operative recovery and may lead to events of aspiration pneumonia or death. The prevalence of dysphagia and its associated mortality rates in elderly hip fracture patients remains unexplored.

Methods: In a retrospective cohort study at an academic tertiary care center, patients aged 65 and older with surgical treatment of hip fractures from January 2015 to December 2020 were analyzed. Main outcome measurements included patient characteristics, surgery dates, dysphagia events, aspiration pneumonia events, and 90-day mortality.

Results: Out of 617 patients who underwent surgical hip fracture treatment, 56.2% had documented dysphagia, with 7.3% experiencing aspiration pneumonia. Patients with dysphagia

had higher mortality rates (8.9%) than those without (2.6%) (chi squared, $p = 0.002$). Mortality rates were significantly greater in patients with acute perioperative dysphagia (21.2%) compared to those with chronic dysphagia presenting perioperatively (6.8%) (chi squared, $p = 0.01$). There was no significant difference in mortality rates between those with aspiration pneumonia (8.9%) and those without (5.9%) (chi squared, $p = 0.64$)

Discussion: The study highlights the underreported issue of dysphagia among elderly hip fracture patients. With nearly half of the patients experiencing swallowing difficulties, and significantly increased mortality risks for those with dysphagia, early evaluation and intervention to improve postoperative outcomes is needed in the elderly hip fracture population.

Poster #6

Evaluation of Left Ventricular Longitudinal Strain by Cardiac Magnetic Resonance in Known and Suspected Ischemic Heart Disease

Carter, Caroline

Background: Left ventricular peak global longitudinal strain (GLS), which primarily reflects sub-endocardial function, is a promising marker for identifying early left ventricular dysfunction. GLS might discriminate between coronary artery disease (CAD), suspected coronary microvascular disease (CMD), and controls. Additionally, peak segmental longitudinal strain (SLS) might differentiate amongst varying levels of myocardial ischemia.

Methods: Cardiac magnetic resonance (CMR) images from 114 individuals (77(68%) men, age 61 ± 17 years, 81(71%) hypertension, 43(38%) diabetes, 77(68%) hyperlipidemia) conducted across 8 centers were retrospectively examined. CAD ($n=57$) was defined as stenosis $\geq 70\%$ in 1 major vessel as confirmed by invasive coronary angiogram (ICA) or coronary computed tomography angiography (CCTA). Suspected CMD ($n=39$) was defined as subjects with angina and >2 risk factors for CMD (female, diabetes, hypertension, hyperlipidemia, smoking) without obstructive CAD as confirmed by ICA or CCTA. Controls without cardiovascular disease ($n=18$) were included. A CMR post-processing software computed GLS and SLS by feature-tracking method from two-chamber, three-chamber, and four-chamber long-axis cine images, acquired by steady-state free precession technique. For strain value comparisons, Games-Howell tests were performed with R Studio.

Results: Compared to controls (-17.4 ± 2.02), GLS was lower amongst subjects with CAD (-13.3 ± 3.80 , $p < 0.0001$) and suspected CMD (-15.5 ± 2.63 , $p = 0.01$). GLS was lower in subjects with CAD than suspected CMD ($p = 0.003$). Compared to $\geq 70\%$ stenosis, LGE(+), and absence of obstructive CAD groups, the control group had a significantly greater absolute value of SLS ($p < 0.001$).

Discussion: GLS could distinguish between CAD, suspected CMD, and healthy volunteers. SLS could discriminate different levels of myocardial ischemia from controls.

Poster #7

Correlates of Cannabis and Opioid Craving Among Patients with Chronic Pain

Chipoletti, Ashley

Background: Approximately 5 to 8 million Americans use long-term opioid therapy for the treatment of chronic pain. Chronic pain patients are increasingly using cannabis as an adjunct to long-term opioid therapy as more U.S. states continue to legalize cannabis use. Opioid-cannabis co-users have been shown to be at an elevated risk of aberrant drug use, and craving has been identified as an important risk factor for problematic drug use among this population.

Methods: A sample of 46 individuals with chronic pain who use cannabis and opioids completed questionnaires assessing demographics, co-use, clinical risk factors, and opioid and cannabis craving. Using linear mixed effects models, the levels of craving on days of co-use were compared to days of no use, opioid use only, and cannabis use only. The correlation between craving and concurrent risk factors was also analyzed.

Results: On days of co-use, participants reported increased cravings for opioids and cannabis compared to days of no use or sole use of either substance. Opioid and cannabis cravings were elevated in association with higher levels of pain, pain catastrophizing, and negative affect.

Discussion: Cravings for both cannabis and opioids were greater on days of co-use, indicating that co-use was more prominent when subjects experienced heightened craving. The most significant factors for cannabis and opioid cravings were found to be high levels of current pain and pain catastrophizing. These variables may play a crucial role in how individuals with chronic pain experience cravings and represent important targets for modulating the risk of non-medical drug use among opioid-cannabis co-users.

Poster #8

Using peripheral nerve stimulation to treat neuropathies of the upper extremity: a systematic review

Choi, Janice

Background: Peripheral neuropathy of the upper extremity often arises from nerve entrapment or nerve injury, and can result in chronic, debilitating pain. Peripheral nerve stimulation (PNS) has been shown to restore nerve function and provide pain relief in various neuropathies, particularly in cases refractory to conventional pain management strategies. Our aim was to evaluate the effectiveness of PNS for improving peripheral neuropathy and neuropathic pain due to an upper extremity nerve entrapment or injury.

Methods: A systematic search was conducted across PubMed, Cochrane, Ovid Medline and Web of Science to identify studies using PNS in upper extremity nerve entrapment or injury patients with reported outcomes measuring neuropathy (pain, sensory and motor function). Data regarding PNS type, neuropathy type, pain scores, motor unit number estimation, treatment duration, and study quality was extracted.

Results: Twenty-six studies (973 total participants) were included. Twenty-two studies reported pain relief, with significant decreases in the 11-point Numeric Pain Rating Scale from baseline (range: 2.92-6.43). Four studies reported improved nerve function. All studies evaluating secondary outcomes such as concomitant pain medication use and quality of life found improvement in at least one measure. Both permanent and temporary PNS yielded significant improvements, with minimal complications and promising long-term outcomes.

Discussion: Overall, PNS safely and effectively improved neuropathic pain, function, and quality of life in patients with nerve entrapment or injury of the upper extremity. More controlled studies are needed to assess the effectiveness of PNS compared to usual care.

Poster #9

Longitudinal Outcomes of Successive Aortic Operations in Connective Tissue Disease Patients

Choudhary, Fatima

Background: Connective tissue disease (CTD) patients are at high risk of aortic dissection and aneurysm, leading to significant morbidity and mortality. Despite frequent need for multiple aortic repairs over their lifetime, little is known about outcomes of successive operations. This study aimed to analyze clinical outcomes of each successive aortic operation in CTD patients.

Methods: A retrospective study was conducted using data from aortic database registry between 2012 and 2022 to identify patients with history of CTD. Outcomes were analyzed for each aortic repair throughout the patient's lifetime. Primary endpoints were major adverse events (MAE) and long-term survival.

Results: Nineteen patients underwent 42 aortic operations throughout follow-up. There were 9 Marfan Syndrome (47.4%), 5 Loeys-Dietz Syndrome (26.3%), and 5 unknown CTD variant patients. The mean age at CTD diagnosis was 32 ± 11 years, and 41 ± 13 years at index operation. Our cohort was followed over a median of 68 months (IQR 37-124 months). Open surgeries included 12 thoracoabdominal, 7 thoracic, and 2 descending aortic repairs. Endovascular surgeries included 19 TEVAR, 1 EVAR, and 1 TEVAR/EVAR. Overall, there were 10 MAE (23.8%) (1 in-hospital mortality, 2 paraplegia, 1 bowel ischemia, 8 reinterventions). There were no independent predictors of MAEs. Survival at 3-, 5-, and 10-years were 94%, 91%, 75%, respectively. Freedom from life-time aortic reintervention were 42%, 17%, and 6% at 1-, 3-, 5-years, respectively.

Discussion: In CTD patients undergoing lifelong surveillance, successive endovascular or open aortic operations have favorable outcomes. The risks of successive aortic operations are likely proportional to the extent of aortic disease and inherent risks of the operation.

Poster #10

Utility of Tilt Table Testing in Management of Seizure-like Activity after Inconclusive Epilepsy Monitoring Unit Admission

Cios, Krystyna

Background: Many patients suffer from unexplained loss of consciousness (LOC) and remain without a diagnosis after extensive neurological and cardiological work-up. Even the gold standard of diagnosis for epilepsy, epilepsy monitoring unit (EMU) studies, leave 12-24% of patients without definitive diagnosis. Lack of definitive diagnosis burdens patients with anxiety and practical restrictions like driving. Tilt Table Testing (TTT) can help distinguish between epileptic and dysautonomic (i.e. Postural Orthostatic Tachycardia Syndrome, POTS) causes of LOC, and is an inexpensive, low risk intervention. We hypothesize that inclusion of TTT in the diagnostic protocol improves medical management of patients suffering from recurrent unexplained episodes of LOC.

Methods: Retrospective data are collected on 22 patients who underwent TTT following inconclusive EMU between 03/2022 - 09/2023.

Results: Twenty two patients were evaluated by TTT following an inconclusive EMU. Of these, 13.6% (3) patients had an EMU showing seizure activity (positive EMU) and underwent TTT to rule out coexisting POTS; all had negative TTT with no change in management. Of the remaining 86.4% (19) patients with negative EMU, 73.7% (14) had positive TTT and benefitted from definitive POTS diagnosis. TTT also improved management through pre-epilepsy surgery evaluation, discontinuation of antiepileptic drugs, and transition from neurologic to primarily cardiologic management.

Discussion: EMU has utility in ruling out seizures as the etiology of LOC. In a subset of patients with diagnostic uncertainty following EMU, TTT provides definitive diagnosis, which improves patient well-being. We strongly recommend that patients with inconclusive EMU undergo TTT.

Poster #11

Black Widow Spider Envenomation: A Review of National Data

Condlin, Emily

Abstract: Black widow spider (BWS) envenomation is a risk in much of the United States (U.S.). The Poison Center National Poison Data System (NPDS) is the most comprehensive dataset of poisonings and exposures across the U.S. and therefore was used to inform this analysis. A similar analysis was conducted from 2000-2008; however, with the advent of improved antibody mediated antivenoms with unique risk profiles, an updated understanding is necessary.

Methods: Data from the NPDS for all closed, human exposure to BWS from 01/01/12 through 12/31/22 was performed using identifier 0194000 and keywords spider, black widow, and envenomation. Data for age, clinical effect, exposure site, gender, level of health care facility care, medical outcome, reason, start date month, and therapy were extracted and analyzed in this study.

Results: Our study found that BWS bites are common venom exposures reported to U.S. Poison Centers. While antivenom is likely the most effective treatment for severe BWS bite sequelae, a variety of conservative treatments are likely sufficient and of more acceptable risk profiles when treating the majority of BWS exposures. Still, high risk groups and those with extreme venom exposures may be good candidates for antivenom treatments.

Discussion: This study analyzed available data on treatment of BWS envenomation across the U.S. This information provides valuable data to providers attempting to create dynamic, individualized care while maintaining the lowest adverse event risk profile. Research to make antivenom therapies safer and more accessible is ongoing and has the potential to lead to more effective and efficient treatment in the future.

Poster #12

Evaluation of Weekend Operating Room Delays at a Level 1 Trauma Center: A One-Year Retrospective Analysis

Cook, William

Background: Operating rooms (ORs) are crucial yet costly hospital assets, making them prime targets for cost reduction in healthcare. This retrospective case study seeks to use the electronic medical record (EMR) to analyze the primary reasons for delayed start times for the first cases on weekends in the Department of Orthopedic Surgery at an academic level 1 trauma center.

Methods: We reviewed the institutional EMR for first-start weekend cases between January 1, 2022, and January 1, 2023. Inclusion criteria covered orthopedic trauma cases on weekends, overseen by the on-call orthopedic trauma attending surgeon. A "timely" case start was defined as documented "in-room" time of 07:30. Statistical analysis, including ANOVA, was conducted to account for variations in delays and weekend occurrences.

Results: In 2022, out of 106 weekend days studied, 88 initial cases were recorded, while 18 days did not meet the inclusion criteria for the first case. Causes of delay included "Other/Not Recorded" (24, 27%), patient factors (6, 6.8%), inadequate anesthesia coverage (14, 16%), transport issues (10, 11%), OR delays (18, 20%), surgeon-related factors (7, 8%), "weekend" (5, 5.7%), and pre-op delays (4, 4.5%).

Discussion: In 2022, none of the 88 first cases on 106 weekend days began on time. The most common causes of delay were "Other/Not Recorded," OR-related factors, and insufficient anesthesia coverage. Addressing these issues through further investigation will enhance patient outcomes, reduce OR expenses, and optimize resource usage. Further research is essential to develop data-driven strategies for ongoing evaluation and effectiveness in reducing delays.

Poster # 13

B-scan Ultrasonography Findings in Patients with Endophthalmitis and Associated Visual Outcomes

Cotton, Caroline

Background: Endophthalmitis is a severe infection within the tissues of the eye that can detrimentally and permanently affect vision. The purpose of this project was to further investigate whether B-scan ultrasonography can serve as a tool to diagnose endophthalmitis and to predict the visual prognosis of patients with endophthalmitis.

Methods: Retrospective chart review of patients age >18 (n = 209) diagnosed with endophthalmitis and received B-scans at MEEI from 2011-2021. Demographic data, endophthalmitis type, causative organism, slit lamp findings, and B-scan findings at diagnosis and extended visits were recorded for each patient. These data were compared to long-term best corrected visual acuity (BCVA) outcomes (BCVA at 1-year post-diagnosis or most recent BCVA within 1-year of diagnosis).

Results: Primary Outcome: Dense vitreous opacities, choroidal detachment, and retinal detachment on B-scan at diagnosis were associated with significantly worse final BCVA ($p = 0.007$, $p = 0.037$, $p = 0.003$). There were more retinal detachments in 1 month B-scans than initial scans ($p < 0.001$). Choroidal detachments were less common in 1 month B-scans than 1 week B-scans ($p = 0.020$). Patients who developed a retinal or choroidal detachment had significantly worse final BCVA compared to patients who did not exhibit either finding ($p = 0.002$ and $p = 0.008$).

Discussion: Advanced B-scan ultrasonography features (dense opacities, choroidal detachment, and retinal detachment) identified at diagnosis and extended follow-up visits may predict poor visual outcomes in patients with endophthalmitis. Initial and follow-up B-scans may be useful in patients with endophthalmitis to promptly diagnosis, monitor progression, and appropriately treat complications.

Poster #14

Evaluation of Pediatric Food Bank: Addressing Food Insecurity and Nutrition in an Academic Pediatric Outpatient Clinic

Crites, Sean

Background: In 2021, food insecurity affected 12.1% of children in Charlottesville, prompting the establishment of the UVA Children's Hospital's Battle Building emergency food bank. This study aimed to digitize pantry utilization data from July 2021 to June 2023. The objectives were to provide demographic insights into pantry users, evaluate referral patterns, and optimize food stocking to enhance the pantry's functionality and support ongoing research in addressing food insecurity at medical centers.

Methods: Data on pantry usage, patient demographics, and food items distributed were collected from patient charts and recorded in a Qualtrics survey. Descriptive statistics were employed to analyze demographic and distribution data.

Results: From July 2021 to June 2023, the pantry distributed 515 food packages to over 355 patients from 113 different zip codes. Pantry utilization increased over time, peaking at 43 families in May 2023. Patients were from a variety of racial and ethnic backgrounds (40.65% “Other”, 29.58% “White”, 25.07% “African American”, and 50.42% “Hispanic”). Most patients served were <1 year old. Patients were most commonly referred from the General Pediatrics service (42.7%).

Discussion: Increased pantry utilization over recent months suggests a consistent need in the region. Hispanic patients’ disproportionate usage may indicate that additional resources along with more culturally considerate food options are needed to better serve this population. Identifying pantry usage patterns is the first step toward improving pantry effectiveness for the community. Further research is needed to investigate barriers to access and ways to meet patient food preferences more effectively.

Poster #15

Dexamethasone impact on respiratory status and heart rate variability in preterm very low birth weight infants

Denhard, Kelly

Background: Dexamethasone improves respiratory status in some, but not all, preterm infants. We previously validated a respiratory acuity score (RAS) that predicts adverse respiratory outcomes. We also previously found that dexamethasone improves heart rate variability, via its anti-inflammatory effect, reflected by a decline in a heart rate characteristics index (HRCi). We hypothesized that the impact of dexamethasone on respiratory status would correlate with its effect on HRCi.

Methods: Retrospective analysis of NICU patients <32 weeks gestational age (GA) admitted from 2012-2022 who received >3 consecutive days of dexamethasone for lung disease. Daily mean FiO₂, HRCi, and RAS (respiratory support x FiO₂) were calculated days -2 to +2 relative to dexamethasone start (day 0). We defined “dexamethasone responder” as an infant with >20% decrease in mean RAS day -2 to 0 versus days +1 to +2. We compared changes in HRCi and clinical variables in dexamethasone responders versus non-responders.

Results: Of 69 infants who received dexamethasone with median GA 24 weeks (range 22-31), 36 infants (52%) had a favorable RAS response. Demographics, HRCi, and RAS at dexamethasone start were similar for responders and non-responders. Both responders and non-responders had a significant decrease in RAS (-147 vs -36). Responders had a similar median decrease in HRCi as non-responders (-0.50 vs -0.87). HRCi change was not significantly correlated with RAS improvement ($r=-0.19$, $p=0.11$).

Discussion: Dexamethasone treatment led to improvement in HRCi and RAS, but dexamethasone response was not correlated with improvement in heart rate variability as measured by HRCi.

Poster #16

Gender Expansive Population in the University of Virginia Pediatric Endocrinology Department and Teen and Young Adult Health Center

D'Ovidio, Christina

Background: In 2022, 76% of transgender and nonbinary youth in Virginia reported anxiety and 60% reported depression with 53% seriously considering suicide in the past year and 17% attempting. The UVA Pediatric Endocrinology Department and Teen and Young Adult Health Center provide holistic care to this vulnerable population through help with medical transition, mental health, family education, and nutrition.

Methods: A chart review provided insight into the demographic composition of the gender expansive patients in these clinics. The study population was limited using specific ICD-10 codes representing gender-affirming care. A total of 831 charts were initially identified and 657 are completed through data entry (demographic information, first and most recent visit, and psychiatric/gender care medications at each visit) into a designed REDCap database or exclusion. As data relied on provider notes, there were some noted differences between documentation. Analysis used REDCap Project Dashboards and Excel pivot tables.

Results: The majority of gender expansive patients were Non-Hispanic and White. More identified as Male/Transgender Male than any other gender identities. Only seven assigned female at birth identified as female at their last visit and only one assigned male at birth identified as male at their last visit. This could be due to de-transitioning, lack of documentation, or the beginning of gender identity exploration.

Discussion: These demographics are crucial in providing culturally competent care and gaining insight into gender-affirming care recipients. The collected data offers an opportunity to explore mental health and care duration outcomes for pediatric gender expansive patients.

Poster #17

Building a Time Depend Predictive Model for Lymphopenia after Radiation Therapy for Pancreatic Cancer

D'Silva, Susanna

Background: Patients with pancreatic cancer develop severe treatment-related lymphopenia, which is negatively correlated with overall survival. However, there is no computational model to predict the RT plan dependent immune suppression. We evaluated lymphocyte reduction from radiation therapy in pancreatic cancer from the dose volume data and correlated the static organ dose volumes to immune suppression.

Methods: We analyzed 92 patients who received RT to the pancreas. The following structures were contoured using RTOG contouring atlas: superior mesenteric artery, celiac artery, portal vein, inferior vena cava, aorta, liver, stomach, bowel, kidney, spleen, duodenum, and lymph nodes. For each patient for the above organs, integral dose, dose volumes: V2-V50, PTV volume, and dose fractionation were recorded. Statistical analysis was performed using IBM SPSS Statistics.

Results: Lymphocyte drop is maximum at day 35 following initiation of RT, which is about a 79% reduction from Pre-Tx LYA value. Even at day 185, the reduction is 65%. However, if the total dose is less than or equal to 45Gy, lymphocyte drop is less than 0.75×10^9 cells per L. Lymphocyte drop increases with the number of fractions. The highest Spearman rank correlations were observed for stomach, bowel, and kidney, suggesting the importance of these organs for dose sparing in pancreas radiation.

Discussion: Lymphocyte changes correlated most strongly with dose to stomach, bowel, and kidney and number of fractions of treatment. This model for RT-associated lymphopenia can be used to guide immunotherapy decisions. It may also guide how to plan RT while minimizing risk of lymphopenia, which is vital information when trying to treat a cancer with such a poor survival rate.

Poster #18

Neutrophil Extracellular Traps Accelerate Nonalcoholic Steatohepatitis Fibrosis by Modulation of Hepatic Stellate Cells

Dupre, Abigail

Background: Non-Alcoholic Steatohepatitis (NASH) is characterized by inflammation and hepatocyte injury in a steatotic liver. It can lead to fibrosis and ultimately end stage liver disease and hepatocellular carcinoma (HCC). The primary cell type responsible for fibrosis is hepatic stellate cells (HSC). In NASH, HSCs become activated and deposit extracellular matrix, contributing to the fibrotic changes seen in this disease process. Neutrophils have also been shown to correlate with liver fibrosis in Non-Alcoholic Fatty Liver Disease. These cells can establish neutrophil extracellular traps (NETs) which are large, extracellular web-like structures composed of cytosolic and granule proteins assembled on decondensed chromatin. While NETs formation promotes the transition from NASH to NASH-HCC, the role of NETs in liver fibrosis is still unclear. The goal of this study was to elucidate if NETs play a role in hepatic fibrosis through the modulation of hepatic stellate cells.

Methods: A NASH-associated fibrosis mouse model was created by using western diet (WD) plus CCl₄ treatment. Liver samples were harvested from four groups of mice at 12 weeks; histological analysis and western blot were used to assess the correlation between NASH-associated fibrosis and NETs formation.

Results: NETs formation was significantly elevated in the NASH-associated fibrosis mouse model. NETs depletion through DNase I administration alleviated the development of NASH-associated fibrosis. Moreover, NETs formation increased α -SMA expression in HSCs.

Discussion: Dysregulated NETs formation may play a role in NASH pathogenesis by activating hepatic stellate cells. Hence, downregulated NETs formation is implicated as a potential therapeutic target in NASH-fibrosis.

Poster #19

Stool Sphingomyelin Analysis to Predict Parenteral Nutrition-Associated Cholestasis in Very Low Birth Weight Neonates

Esrig, Ari

Background: Parenteral Nutrition-Associated Cholestasis (PNAC), diagnosed by elevated serum conjugated bilirubin secondary to liver damage, correlates with very low birthweight (VLBW, <1500g) and prolonged parenteral nutrition. Previous untargeted fecal metabolomics from our group identified 12 sphingomyelins as potential PNAC biomarkers. This study aimed to validate and quantify these biomarkers through targeted metabolomics.

Methods: We prospectively enrolled VLBW infants from the UVA level IV NICU with guardian consent. Biweekly collection of stool samples and comprehensive clinical data were recorded in a REDCap database. We used mass spectrometry for sphingomyelin detection in stool samples.

Results: We enrolled 34 VLBW infants with mean gestational age 27.4 ± 2.0 weeks, birthweight 880.9 ± 256.5 grams, and TPN duration 17.3 ± 11.6 days. Of these infants, 21 (62%) were White, 13 (38%) were Black, 18 (53%) were male, and 16 (47%) were female. Four infants (12%) developed PNAC. Preliminary analysis of nine stool samples (seven non-PNAC and two PNAC) confirmed the presence of 10 sphingomyelins previously associated with PNAC.

Discussion: Our preliminary results demonstrate the viability of quantifying sphingomyelins in stool samples through targeted metabolomics for VLBW preterm infants, suggesting the potential utility of stool biomarker analysis in predicting PNAC risk. Ongoing data collection and sequencing of the stool microbiome will offer deeper insights into applicability. Successful identification of a stool biomarker for PNAC risk could reduce reliance on blood tests and promote preventative interventions to mitigate liver damage.

Poster #20

Communicating Uncertainty in Patient Handoffs

Farmer, Ryan

Background: Patient handoffs between clinicians are a critical component of safe and effective medical care, yet several factors can cause patient handoffs to be a source of medical error. We hypothesized that these factors include inadequately communicating the degree of uncertainty about patient diagnoses, prognosis, and management, ultimately leading to discordance between clinicians in their working diagnoses and next steps in management.

Methods: Patient handoffs were observed between attending hospitalists and/or advanced practice providers during morning and evening shift change in the UVA Department of Internal Medicine. Verbal patient handoffs were recorded using OtterAI transcription software and were manually edited for later analysis. Natural language processing tools will be used in order to evaluate verbal handoff transcripts and identify phrases associated with communicating uncertainty. Immediately following handoffs, participating clinicians were given surveys that

captured their demographic information as well as their diagnostic, prognostic, and management uncertainty relating to the primary diagnosis.

Results: Survey data were collected between June and July 2023. A total of 111 surveys were completed. Statistical analyses will be performed to determine the extent of discordance among clinicians involved in the patient handoff, and whether a discrepancy exists in diagnostic or prognostic certainty as well as patient management. This research is still ongoing and results will be reported in due course.

Discussion: As patient handoffs are an essential part of modern medical care, we plan to use the results of our study in order to improve handoff education and overall safety of patient handoffs.

Poster #21

Dermatology Resources in the Latinx Community in Charlottesville

Florenzo, Brian

Background: The UVA Latino Health Initiative (LHI) programs “Tardes de Salud Familiar,” and the annual “Latinx Health Fair” provide dermatology resources in the Charlottesville Latinx community.

Methods: The annual “Latinx Health Fair” is a community health fair offering education and screening for a variety of health needs. “Tardes de Salud Familiar” is a monthly multifaceted community health educational program designed to reduce health disparities of the Latinx community by increasing health literacy and disseminating information on local health resources.

Results: The 2022 and 2023 “Latinx Health Fairs” educated and screened more than 20 attendees each, referring them for further workup at UVA or other appropriate clinics when necessary.

The February 2023 “Tardes de Salud” program focused on dermatology, with the title “Enfermedades de la Piel en la Familia Latina.” Faculty and students met with LHI community health workers to train them on the topic and receive cultural validation of the presentation to be offered to community. The interactive community health event featured an educational talk and skin screening services, servicing more than 40 attendees. A monthly newsletter focusing on these common skin conditions was distributed via social media and paper at more than 20 Latinx-friendly locations. For social media outreach, a Q&A session with experts was hosted via Facebook Live and YouTube with 374 viewers.

Discussion: LHI programs and outreach have been instrumental in screening and educating the Charlottesville Latinx community about skin conditions and is continuing to do so through social media, printed fliers, and community events.

Poster #22

Evaluating Patient Demographics and Physical Activity Guidance in Annual Check-ups with Primary Care Physicians

Gaston, Brayden

Background: Physical activity across the lifespan is a clear positive predictor of healthy aging and improved healthspan. One way that physical activity levels can be improved is in the guidance given by primary care physicians during annual check ups. However, prior research has shown this guidance is not always given, nor is it given equally across patient demographics and health statuses.

Methods: I studied the rates of physical activity guidance with primary care physicians at the UVA Family Practice Clinic. A chart review of 100 annual check ups was conducted for patients aged 18-64 from August 2022 to August 2023. Demographic data and chronic health condition status was collected. Then I navigated through the note and searched for evidence of a discussion around physical activity.

Results: In the data set, 23 charts showed no evidence of exercise discussion with the majority having had a discussion, and 68% of the latter having an in-depth discussion as evidenced in the chart. Chi-square analysis was used to find any relationship between each demographic variable and if exercise was discussed. With the sample size used, the only statistically significant relationship was found between age and exercise discussion ($p < 0.05$). It was found that the younger age group (18-39), discussed exercise with their physician more often than the older age group (40-64).

Discussion: With the data set collected, we can conclude that in the physicians sampled, there were not significant discrepancies between patient demographics and those who received advice. A further expanded study with greater power may be needed to further elucidate any relationships.

Poster #23

Promoting Health Equity in The University of Virginia Health System Patient Population

Ghenbot, Rahwa

Background: Health equity involves amelioration of avoidable health differences between socially, economically, and geographically defined groups. This article delves into the intricate dynamics of social determinants of health and disparities within the University of Virginia Health System (UVA Health) patient population, with the aim of advancing health equity.

Methods: Through the analysis of literature, reports and statistics, this study identifies key factors contributing to health disparities among UVA patients, including socioeconomic status, geographical location, and healthcare accessibility.

Results: Regions with higher minority populations, greater rurality, lower socioeconomic standings, and southern/coastal locations face pronounced health challenges. Disparities persist across leading causes of mortality—cardiovascular diseases, metabolic diseases,

cancer, and stroke—exacerbated by historical discriminatory practices. Minority populations encounter obstacles in insurance, employment, and healthcare access, impeding preventive and routine care.

Discussion: A holistic approach is crucial to address these challenges, necessitating interdisciplinary collaboration and community input. Providers should serve as access points for social support, while government-supported programs (e.g., WIC, SNAP, housing support) should be simplified to facilitate accessibility. Employment assistance, modeled on programs for individuals with disabilities and veterans, can help mitigate economic disadvantages contributing to health disparities. The article underscores the social and moral obligation for collaborative efforts among scientific, medical, and bureaucratic entities alongside community leaders to dismantle barriers to health equity in Virginia.

Poster #24

Efficacy of Radial versus Femoral Access in Thrombectomy Procedures

Goudarzi, Ariaz

Background: The role of thrombectomies in managing vascular occlusive disorders, especially ischemic strokes, has historically favored the femoral artery as the preferred access route due to its accommodating diameter and path to cerebral vessels. However, advancements in interventional tools have brought the radial artery into consideration, due to its superficial location and reduced hemorrhagic complications.

Methods: This retrospective cohort study, encompassing 305 thrombectomy procedures (53 radial, 232 femoral, 7 switch from femoral to radial and 9 from radial to femoral) over four years, seeks to provide a comparison between femoral and radial access, addressing a gap in existing literature by not only evaluating clinical outcomes but also exploring procedural and interventionist perspectives.

Results: Radial access demonstrated a slightly lower incidence of intraprocedural complications (3.8% vs. 5% in femoral, P value of 1) and a marginally shorter mean procedure duration (34.56 minutes vs. 39.32 minutes, P-value of 0.215). Additionally, radial access necessitated fewer attempts (average: 1.77 vs. 2.34 in femoral, P value of 0.0057). However, hospitalization duration was comparable between radial (9.12 days) and femoral (9.19 days) groups. Subjective data showed the radial route having slightly easier intercranial routes.

Discussion: While radial access presents certain advantages, the nuanced differences in complications and interventionist preferences highlight the importance of a multifaceted approach in determining the optimal vascular access route. Overall, larger prospective trials should be performed, however the radial route is showing promising results for use.

Poster #25

Lung Cancer Screening Uptake in a Non-Profit Federally Qualified Health Center

Harrelson, Hannah

Background: Lung cancer (LC) is the leading cause of cancer-related deaths in the U.S. The U.S. Preventive Services Task Force (USPSTF) recommends Low Dose CT (LDCT) for LC screening for qualified patients. Federally qualified health centers provide healthcare services to low-income populations, and an income <\$15,000 is associated with lower screening rates. To our knowledge, there have been no studies examining barriers to lung cancer screening uptake in a FQHC since the USPSTF expanded their screening recommendations in 2021.

Methods: Study Population: 2129 current and former smokers aged 50-80 seen by a provider at a Neighborhood Health clinic between 5/22 and 6/23.

Data Collection: Charts were reviewed in ascending age order from 50 years old to 80 years old. Recorded demographic factors included age, gender, race, ethnicity, language, insurance status and type, sexual orientation, tobacco use status, quit date, and pack-year.

Results: Preliminary Analysis: Per the USPSTF 2021 Screening Guidelines, 11% (55) patients qualified for screening, 24.4% (122) did not qualify for screening, and 64.6% (323) were undetermined. 63.4% (317) of patients did not have pack-year documentation. Of those qualified for screening, 54.5% (30) were not recommended screening, 45.5% (25) were recommended screening, and only 10.9% (6) of eligible patients completed the LDCT.

Discussion: Preliminary analysis suggests that lack of pack-year documentation may be a barrier to identifying qualified patients. We will continue to review a total of 2129 charts of current and former smokers aged 50-80 seen by providers at Neighborhood Health clinics between May 2022 and June 2023.

Poster #26

Trends in nipple-sparing mastectomies among individuals with breast cancer: a retrospective cohort from a tertiary academic center, 2014-2020

He, Britney

Introduction: As breast surgery trends have gravitated towards minimally invasive approaches with improved cosmetic outcomes, several studies suggest a rising prevalence of nipple-sparing mastectomies (NSM) in breast cancer patients. This study reports on NSM trends, patient characteristics, and associated outcomes at a tertiary academic care center.

Methods: We performed a retrospective cohort study of patients with primary breast cancer who underwent complete mastectomies at a single tertiary center between January 2014 and December 2020. We compared a subset of females who underwent NSM versus simple mastectomy (SM) using t-tests and chi-square tests.

Results: Among the 605 patients included, the majority were female (98%), Caucasian (80%) and English-speaking (96%), with an average age of 47. 103 (17%) patients elected for NSM, with a trend towards increased NSM preference over the study period. Rates of NSM ranged

from 5% in 2014 to 28% in 2018, declining to 21% in 2019 and 18% in 2020. Patients undergoing NSM tended to be younger ($p < 0.05$) and had unifocal tumors ($p < 0.05$). No other significant differences in patient or tumor characteristics were observed. Nearly all patients (98%) who pursued NSM had reconstruction with an implant or flap. Notably, recurrence rates were similar at 13% for NSM and 9% for SM ($p = 0.79$).

Discussion: These findings demonstrate a trend toward pursuing NSM and subsequent reconstruction in the therapeutic management of breast cancer without compromising treatment effectiveness. Further analyses are warranted to comprehensively evaluate the role and long-term implications of NSM in breast cancer management.

Poster #27

Qualitative Analysis of the Barriers to Inmate Access to Medical Care in the Virginia Correctional System

He, Xin

Background: Virginia Department of Corrections (VADOC) has experienced several high-profile lawsuits in the past decade resulting in major reforms of their healthcare delivery system. The aim of this study was to identify remaining barriers for Virginian inmates in accessing healthcare to guide future state and national policies on correctional care.

Methods: This was a qualitative, descriptive study carried out via the analysis of relevant VADOC documents and operating procedures to determine whether they met correctional care metrics established in a previous Pew study. Information was retrieved from documents on the VADOC official website, as well as from the current constitution and administrative codes of Virginia. Each document was selected and analyzed using the READ (Ready materials, Extract data, Analyze data, Distill) approach to document analysis. Information on EHR and cancer screenings was also verified by members of Virginia Commonwealth University and University of Virginia health systems.

Results: Barriers to health access for inmates include: (1) a lack of a unified EHR system across DOC facilities and between community providers, (2) incomplete inmate health data collection within VADOC, and (3) absence of routine cancer screenings and unified screening procedures between facilities.

Conclusion: According to the documents reviewed, VADOC inmates continues to face several barriers in receiving quality health care, most derived from challenges in patient record keeping and access. Since state DOCs operate on a limited budget, VADOC should consider the financial consequences of current procedures, including litigation and costly chronic diseases, and use these as evidence in their future policy decisions on inmate health.

Poster #28

The Controversial Presentation of the Kidney by Andreas Vesalius

Holum, Parker

Background: Andreas Vesalius is widely considered the father of modern anatomy. His focus on evidence-based anatomy and his textbook, the *Fabrica* (1543), transformed the teaching of anatomy. Yet, his early work suffered from a lack of exposure to human material, at times influencing the *Fabrica*. His occasional reliance on animal anatomy and the work of his predecessors drew criticism from his contemporaries. This project will discuss Bartolomeo Eustachio's criticisms of Vesalius, particularly regarding his description of the kidney.

Methods: A review of historic works and modern literature was conducted, utilizing the Wangensteen Historical Library's collection at the University of Minnesota. A recently translated edition of the *Fabrica* was used to evaluate Vesalius' description of the kidney, and an excerpt from Eustachio's *Opuscula anatomica* (1563) was translated from Latin to examine his criticism of Vesalius.

Results: Eustachio wrote of Vesalius: "Vesalius described, depicted, and dissected the kidney of the dog..." There are multiple pieces of evidence to suggest Vesalius depicted the canine kidney, including the general appearance of the kidneys in the *Fabrica* and his description of their location in the body. However, he did describe a case of hydronephrosis, uncommon in dogs, and correctly dispelled earlier theories regarding the filtration process of the kidney.

Discussion: While it is impossible to conclusively say Vesalius dissected and depicted the canine kidney in the *Fabrica*, it appears likely he was at least influenced by its anatomy. This is not the only example of animal anatomy influencing Vesalius' work and it is important to analyze his work, and the work of his contemporaries, with a critical eye. This does not, however, detract from the important contributions of Vesalius to modern anatomy.

Poster #29

The Effect of Patient Resources on Outcomes in Autologous Breast Reconstruction: A Single Center Matched Cohort Study

Johnson, Anna

Background: At our breast reconstruction center we have developed a focused program to increase access to care for low resource patients. This program includes outreach clinics, physician extenders, care coordinators, and telehealth utilization.

Methods: A retrospective review of all patients undergoing free flap breast reconstruction between 2017 and 2022 at our center was created. Specific criteria including insurance carrier, average educational attainment and median household income of the patient's zip code, language barriers, and distance to hospital were used to create favorably-resourced (FR) and unfavorably-resourced (UR) cohorts. Propensity score matching was then used to control for reconstruction type, timing, oncologic stage, chemotherapy, radiation, age, BMI, smoking status, T2DM, HTN, cardiovascular disease, and autoimmune disease.

Results: 49 and 52 patients met inclusion criteria for FR and UR cohorts, respectively, producing 29 matched pairs. FR was associated with a greater average number of donor site revisions (0.72 vs. 0.45, $p=0.03$). Other statistically significant differences included average zip code household income (\$109,828 FR vs. \$72,940 UR, $p=0.0006$), bachelor's degree education level (26% FR vs. 16% UR, $p<0.0001$), and average distance to hospital (29 miles FR vs. 85 miles UR, $p<0.0001$). No significant differences were detected between groups regarding mastectomy skin flap necrosis, recipient site infection, recipient site wound, breast revisions, donor site infection, donor site wound, seroma, fat necrosis, hernia/bulge, length of follow-up, or drain removal time.

Discussion: This study shows that through the utilization of access to care programs equivalent results can be achieved in autologous breast reconstruction in both favorably and unfavorably resourced patients.

Poster #30

Dietary Methionine and Homocysteine Level Interaction with Recurrent Stroke

Kabir, Farah

Background: The folate one-carbon metabolism pathway (FOCM) provides vital one-carbon units for epigenetic regulation. Genetic variants in FOCM genes may affect methionine metabolism. Elevated circulating homocysteine (Hcy), a FOCM byproduct, is linked to increased stroke risk. However, the protective effects of dietary regulation of methionine and Hcy levels against recurrent stroke are uncertain. Our objectives were: to investigate dietary methionine (METH) and its interaction with post-methionine load Hcy levels (POST) with recurrent stroke risk; to assess if genetically determined POST and its interaction with METH predict recurrent stroke risk.

Methods: We utilized the Vitamin Intervention for Stroke Prevention (VISP) trial to estimate hazards ratios of METH and its interaction with POST on recurrent stroke with a Cox proportional hazards model. We also generated a POST polygenic risk score (PRS) with ridge regression using previously identified polymorphisms, located within ALDH1L1, CPS1, GNMT, and PSPH, as indicators of FOCM function.

Results: The participants ($n=2,100$; 64% men) had a mean (SD) age of 67 (11) years with few (7.3%) having missing POST values. Ancestry consisted of 82% European, 12% African, and 5.7% Other. Clinical POST (HR 1.02; 95%CI 0.98, 1.06) and its interaction with METH (HR 0.99; 95%CI 0.97, 1.01) were not associated with recurrent stroke risk. Similarly, there was no significant relationship observed between PRS POST (HR 0.96; 95%CI 0.80, 1.15) and its interaction with METH (HR 1.02; 95%CI 0.94, 1.10).

Discussion: Dietary methionine and post-methionine load homocysteine levels neither interact nor predict recurrent stroke risk. Our PRS approach showed similar negative findings. The FOCM's relationship with recurrent stroke risk may lie in epigenetics.

Poster #31

Multimodal Evaluation of VEGF-induced Ocular Pathology

Karri, Vishnusai

Background: Vascular endothelial growth factor (VEGF) is a key driver of ocular complications in many retinal diseases, including diabetic retinopathy and age-related macular degeneration. We evaluated VEGF-induced ocular pathological changes with multimodal assessment using a mouse model with intravitreal injections of VEGF.

Methods: Recombinant human VEGF-A 165 protein or vehicle was administered into mouse vitreous humor, with dosages ranging from 50ng to 500ng. Mouse eyes were evaluated with optical coherence tomography (OCT) and fluorescein angiography (FA)/leakage assay using Evans Blue 24 hours after the administration. Electroretinography (ERG) was recorded 20 days after administration.

Results: OCT images revealed significant retinal thickening 24 hours after VEGF administration (10-15% increase from baseline retinal thickness) compared to the vehicle (2.5% increase from baseline retinal thickness). VEGF-injected eyes exhibited a significant decrease of both a- and b-wave amplitudes on ERG (42.3% and 44.2% reduction of a- and b-wave amplitude, respectively, from baseline), compared to 9.0% and 18% reduction, respectively, in the vehicle-injected eyes, 20 days after injection. Fluorescein angiography imaging showed robust fluorescein leakage into vitreous humors, and Evans Blue leakage assay showed dose-dependent leakage when compared to the vehicle 24 hours after VEGF administration.

Discussion: VEGF intravitreal administration in mice induced robust retinal thickening, ocular leakage, and retinal electrical dysfunction, as manifested in various retinal diseases, including diabetic retinopathy and age-related macular degeneration.

Poster #32

Outcome of Large Vessel Occlusions in Frail and Non-frail Patients: A Comparative Analysis

Kartchner, Cate

Background: LVOs account for nearly 46% of acute ischemic strokes and often lead to substantial morbidity and mortality. Frailty (diminished physiological reserves and increased vulnerability to stressors) has been identified as a factor that may influence the prognosis and management of patients. This review aims to investigate the differences in clinical outcomes between frail and non-frail patients with LVOs who underwent mechanical thrombectomy.

Methods: A retrospective analysis of a prospectively collected database was conducted for 302 patients admitted to UVA with acute ischemic stroke due to an LVO over 2.5 years. Patients were categorized as frail or non-frail based on the Modified Frailty Index (MFI), which estimates frailty by measuring five accessible factors. The primary outcomes assessed were functional disability at discharge and follow up, and in-hospital mortality.

Results: 68.5% of patients were identified as frail based on the MFI, exhibiting distinct characteristics including a statistically significant higher prevalence of hypertension,

hyperlipidemia, and history of smoking. In terms of outcomes, frail patients experienced marginally lower average discharge mRS and NIHSS scores compared to non-frail patients.

Discussion: The classification of frailty did not impact outcomes as anticipated, possibly due to the efficient stroke care protocols in place. This data emphasizes the importance of early identification and target interventions in all patients. These findings contribute to our understanding of the complex interplay between frailty, stroke, and treatment outcomes, paving the way for more targeted and personalized care strategies in the future.

Poster #33

The Effect of Pre-operative Exercise on Immune Cell Trafficking in Liver Metastases

Ke, Benjamin

Background: Surgical resection is a mainstay treatment for patients with primary or metastatic liver cancer. However, surgical trauma itself is pro-inflammatory and pro-tumorigenic, increasing the likelihood of cancer recurrence. We aim to characterize how pre-operative exercise therapy (PEX) influences the tumor immune microenvironment and to use these findings to improve clinical outcomes.

Methods: Eight-week-old C57BL/6 mice were randomly divided into PEX and sedentary (Sed) groups. PEX mice ran on a motorized treadmill at 12.5 m/min for 60 min/day, 5 days/week for 4 weeks. To simulate liver metastasis, 10^5 MC38 colorectal cancer cells were injected into the portal vein, and surgical stress was modeled with mouse warm ischemia-reperfusion injury protocols. Mice were sacrificed 3 weeks later, and immune cell populations from hepatic metastasis were quantified using flow cytometry.

Results: Liver samples isolated from mice in the PEX group had significantly greater CXCL9+ Kupffer cell populations (CXCL9+Clec4f+F4/80+Cd11b+) and CXCR3+ cytotoxic T cell populations (CXCR3+CD8+) compared to those from the Sed group. Additionally, significantly more T cells from the PEX group expressed granzyme B, IFN- γ and TNF- α compared to those in the Sed group.

Discussion: This data suggests that following PEX, more Kupffer cells expressing CXCL9 may enhance recruitment of CD8+ cytotoxic T cells through CXCL9/CXCR3 chemokine-mediated cell migration. Surprisingly, PEX was associated with improved tumoricidal ability of cytotoxic T cells, as evidenced by increases in cells with anti-tumor effector molecules. This mechanism supports our ongoing understanding of how PEX can attenuate tumor progression.

Poster #34

Methods to Evaluate Vascular Effects of Cocoa Flavanols on Calf Muscle Perfusion in Patients with Lower Extremity Peripheral Artery Disease

Kirkpatrick, Summer

Background: Peripheral artery disease (PAD) can lead to reperfusion injury to calf muscles, including myofiber damage and decreased mitochondrial activity. There are few treatments that improve or prevent further decline in muscle function; however, recent preliminary studies have shown that patients with PAD who consumed cocoa flavanols daily had significantly improved 6-minute walk distance at six-month follow-up vs. placebo. Methods to reliably quantify perfusion changes due to these potential treatments remain an active area of research.

Methods: 190 eligible participants are being randomized to take two capsules daily of either cocoa flavanols or placebo in an ongoing study. Arterial spin labeling (ASL) MRI is being used to quantify changes in calf perfusion. A thigh cuff is inflated to 200-250mm Hg for 4 minutes to cause arterial occlusion, and motion-corrected (MOCO) structural and ASL perfusion MR images are acquired after cuff deflation and reperfusion. Regions of interest (ROIs) of each calf muscle group are segmented on MOCO images and then copied to the associated ASL slice to obtain intensities corresponding to blood flow. ROIs on ASL images are manually adjusted to exclude large blood vessels. Average intensities of each muscle group for a given ASL image are generated. Mean ASL perfusion values are compared across slices to identify the greatest perfusion intensity and thus peak blood flow for each patient.

Results: This study is ongoing and thus data analysis is not yet complete. The researchers remain blinded to all data points during image interpretation.

Discussion: ASL perfusion MRI is a valuable noninvasive technique in the evaluation of calf muscle perfusion. With ongoing analysis, we aim to understand whether cocoa flavanols improve calf muscle blood flow in patients with lower extremity PAD using ASL imaging.

Poster # 35

Venous Thromboembolism Risk Stratification in Patients with WHO Grades 3 & 4 Diffuse Gliomas

Kopp, Emily

Background: Patients with newly diagnosed gliomas are at high risk for venous thromboembolism (VTE), including deep venous thrombosis (DVT) and pulmonary embolism (PE). Prior studies have investigated potential risk factors associated with VTE in this population. This study attempts to validate these assessments and identify new risk factors in patients with World Health Organization (WHO) grades 3 and 4 diffuse gliomas.

Methods: This is a retrospective case-control study of 514 patients aged ≥ 18 years with newly diagnosed WHO grade 3 (astrocytoma or oligodendroglioma) or grade 4 (astrocytoma or glioblastoma) gliomas. Data for risk factors including demographics, clinical characteristics, laboratory parameters, and treatments were recorded. Outcomes regarding any subsequent VTEs and mortality were also collected. Preliminary statistics are reported.

Results: 24.9% of patients in the cohort developed a VTE. Patients who developed VTEs were more likely to have limb weakness at glioma diagnosis (25.78% vs. 17.18%, $P = 0.039$), to have a grade 4 tumor (89.06% vs. 70.83%, $P = 2.853 \times 10^{-5}$), to have taken bevacizumab (58.59% vs. 41.67%, $P = 0.0018$), and to have hypertension at baseline (67.19% vs. 57.92%, $P = 0.061$).

Discussion: This preliminary analysis evaluates data from 514 of 907 patients within the specified cohort; data collection and analysis are ongoing. Early results validate many previously identified risk factors for VTE. This work aims to reduce VTE morbidity and mortality by improving predictive models and identifying patients for aggressive prevention.

Poster #36

Kinetics of enteric pathogen quantity during acute diarrhea in children in resource-limited settings by quantitative PCR

Lain, William

Background: Diarrhea remains a significant cause of morbidity and mortality in children under 5 in resource-limited settings. While quantitative PCR (qPCR) is increasingly used to identify the etiology of diarrhea, the dynamics of pathogen detection during an episode are poorly understood.

Methods: We analyzed data from the MAL-ED multisite birth cohort study conducted at eight locations (2009-2012). Fieldworkers collected stool samples from children twice a week and monthly during non-diarrheal and diarrheal episodes. Traditional methods were used for sample analysis, followed by re-testing with qPCR. Focusing on the eight pathogens with the highest attributable burden of diarrhea, we modeled the relationship between days of symptoms at sample collection and pathogen quantity. Subsequent modeling considered age, malnutrition, and repeat infections to understand their impact on pathogen kinetics.

Results: Among 44,427 stool samples, 6,692 were collected during diarrheal episodes. Further filtration allowed consideration of episodes with a single assigned etiology. We observed pathogen quantity peaking within days 0-3 of symptoms. Notably, rotavirus, known for its short duration, showed a significant 2-log reduction in pathogen quantity within seven days of symptoms. Age, malnutrition, and repeat infections were also observed to influence pathogen quantity throughout episodes. Finally, we also observed the day of sample collection affecting traditional test sensitivity, peaking on days 0-4.

Discussion: Overall, the collection day may alter etiology attribution via qPCR and traditional testing. Studies aiming to optimize etiology assignment should strive to collect samples during the first few days of symptoms whenever possible.

Poster # 37

Magnetic Resonance Imaging versus Diagnostic Arthroscopy to Identify Intraarticular Pathology Associated with Patellar Instability: A High Rate of Discordant Findings Altering Surgical Treatment

Le, Royce

Background: Acute traumatic patellar dislocations can lead to recurrent symptoms of patellar instability for which treatment includes reconstruction of the medial patellofemoral ligament (MPFL). The purpose of this study is to determine the rates of coexisting intra-articular pathology in patients with patellar instability requiring MPFL reconstruction and elucidate any discordance between preoperative MRI and diagnostic arthroscopy findings.

Methods: All patients undergoing MPFL reconstruction at a single institution between 2010 and 2023 were identified and preoperative MRI reports were queried. Arthroscopic and MRI findings were recorded as discordant if a lesion identified on arthroscopy was not present in the full MRI report. Procedures undertaken as a result of these missed pathologies on MRI were recorded.

Results: 640 patients were identified, and 507 complete records were included. Preoperative MRI identified patellar cartilage lesions in 333 patients(66%), loose bodies in 119 patients(24%), lateral femoral condyle cartilage lesions in 97 patients(19%) and meniscus tears in 47 patients(9%). Among these patients, 172(34%) had a diagnosis during arthroscopy which was not identified on preoperative MRI. These arthroscopic findings resulted in 75 loose body removals, 74 patellar shaving chondroplasties, 16 partial meniscectomies, 3 microfractures, 3 osteochondral lesion fixations, and 2 meniscal repairs which would have been omitted due to discordant MRI findings.

Discussion: Over 1/3 of patients who underwent diagnostic arthroscopy during patellar instability surgery had pathology identified which required surgical intervention that was not reported on a pre-operative MRI. The findings of this study highlight the importance of diagnostic arthroscopy in the treatment of patellar instability.

Poster #38

Utilizing Bayesian Machine Learning to Identify Predictive Features of Recurrent Clostridioides Difficile Infection

Lee, Manny

Introduction: Approximately 25% of Clostridioides difficile infection (CDI) patients will develop recurrent CDI (rCDI). Accurate rCDI risk assessment at index CDI diagnosis is critical for preventing rCDI, however, existing rCDI predictive models underperform, likely owing to poor feature selection and lack of a symptom-based rCDI definition. Many putative rCDI risk factors exist but the relative importance of these factors is unknown.

Methods: We assembled a database of hospitalized CDI cases between November 2013 and April 2021 using clinical chart review to capture additional rCDI cases (within 60 days of index diagnosis) where retesting could not be performed (defined as recurrence of CDI symptoms after treatment completion requiring retreatment). Twenty-five rCDI risk factors were gathered based on previously published risk models and consensus guidelines. We used Bayesian

Machine Learning to select the most important independent risk factors for rCDI within a multivariable logistic regression model.

Results: Among 1,660 CDI cases, 167 had rCDI via positive re-testing within 60 days (10.1%). Through chart review, we identified an additional 200 cases, yielding a total 367 cases of rCDI (22.1%). Six variables were found to have non-zero probabilities of being included in the best model: recurrence number (probability, 0.9989), *C. difficile* PCR cycle threshold (0.8341), hospital-onset CDI (0.5478), antibiotic usage within 60 days (0.4314), intensive care unit admission at CDI onset (0.0884), and treatment with vancomycin (0.0525).

Discussion: Test-based rCDI definitions may under capture clinically-relevant rCDI. We were able to select the 6 features that are together most likely to accurately predict rCDI.

Poster #39

Endocrine therapy and ovarian suppression approaches for risk reduction among premenopausal women with hormone positive breast cancer following mastectomy

Lefbom, Lucie

Background: National guidelines recommend treating premenopausal women with estrogen receptor positive (ER+) invasive breast cancer with tamoxifen followed by an aromatase inhibitor (AI) or AI plus an ovarian function suppressive (OFS) agent. There is a paucity of information on endocrine therapy utilization and risk-reducing gynecological surgeries among premenopausal women after mastectomy, despite this representing a particularly vulnerable population with elevated risk of side effects and psychological sequelae.

Methods: We performed a retrospective cohort study of patients with breast cancer who underwent complete mastectomy at a single tertiary center between January 2014 and December 2020. Of 607 total patients, we analyzed a subset of 96 premenopausal females with ER+ invasive breast cancer.

Results: This sample was majority white (84%) with an average age of 42 years. Three patients had BRCA mutations. Six (6%) decided against endocrine therapy, three of whom were non-white. Of remaining patients, 59 (65%) started Tamoxifen, 16 (18%) started an OFS agent and AI, and 15 (17%) underwent bilateral salpingo-oophorectomy (BSO) and started an AI. Among patients with ≥ 5 years of follow up, 28/57 (53%) discontinued endocrine therapy prematurely. Discontinuance increased to 9/12 (83%) among women after BSO.

Discussion: Over half of premenopausal women discontinued endocrine therapy early, with patients who underwent BSO having the highest rates of discontinuance. Providers should be familiar with these trends in endocrine therapy usage, as well as medication side effects and risk-reducing surgical options, to help improve compliance to recommended treatments in this subset of high-risk patients.

Poster #40

Primary Care Provider's Approaches to Diagnosis and Therapy of Adults with Attention Issues

Lewis, Jonah

Background: Diagnoses of ADHD have increased dramatically over the last several years. This phenomenon has coincided with a large increase in public discussions of ADHD, especially online through sites like TikTok. These joint phenomena drove the research question underlying this project: How does patient self-diagnosis of ADHD (either organic or based on TikTok content) affect the diagnostic and treatment decisions made by Family Physicians?

Methods: I am using a randomized intervention to examine physician responses to adult complaints of attention problems. Physicians are receiving a link to a survey, which randomizes to one of three conditions: a patient with attention concerns, the same case but the patient expressed interest in ADHD treatment based on the advice of their friend, and the same case but the patient expressed interest based on content they saw on TikTok. They are then asked a series of multiple choice and open ended questions regarding their diagnostic and treatment plan for this case.

Results: Data collection is ongoing for this project, with a goal of receiving 150 responses. So far 43 individuals have completed the survey and 42 met qualification criteria. Of those, 37 have been white, three have been Black, one has been American Indian/Alaskan Native, and one has preferred not to answer. Of the respondents, 58% have been men and 42% have been women.

Discussion: Response rates have been better than expected for this period of outreach, so we hope to meet and exceed our response goal. From there, we hope to have sufficient data to suss out whether patient self diagnosis does impact provider diagnostic and treatment plans.

Poster #41

Molecular epidemiology and characteristics of shigellosis in the Global Pediatric Diarrhea Surveillance network, 2019-2020

Lewontin, Myra

Background: Shigella, a leading global cause of pediatric diarrhea, consists of several species with corresponding serotypes. Understanding distribution of these serotypes and their epidemiological characteristics is key in developing treatment strategies, including vaccines. However, we lack accurate, globally representative data on serotype distribution.

Methods: The Global Pediatric Diarrhea Surveillance (GPDS) network collects stool specimens from children under age 5 hospitalized with diarrhea at 33 sites in low- and middle-income countries and tests these samples via qPCR. We applied an algorithm to determine serotype for Shigella-positive GPDS samples based on qPCR results. We compared clinical characteristics for infections between *S. flexneri* and *S. sonnei*, the two predominant species.

Results: Of the 555 Shigella-positive samples, 43% were *S. flexneri*, 25% were *S. sonnei*, and the remaining 33% were other Shigella infections (*S. boydii*, *S. dysenteriae*, or mixed

infections). The predominant *S. flexneri* serotypes were 2a (21%), 3b, (5.6%), 3a (3.4%), and 6 (3.4%). Compared to *S. flexneri*-attributable cases, *S. sonnei* cases showed lower likelihood of bloody diarrhea (OR 0.35; 95% CI 0.16-0.75), higher likelihood of vomiting (OR 2.53; 95% CI 1.18-5.41) and dehydration (OR 5.95; 95% CI 2.24-15.8), and no difference in diarrheal severity (Beta 0.29; 95% CI -0.13-0.70) or likelihood of acute diarrhea (OR 1.16; 95% CI 0.17-7.98).

Conclusions: Our results indicate that vaccines targeting *S. sonnei* and *S. flexneri* serotypes 2a, 3a/3b, and 6 will likely provide the greatest protection against shigellosis. Our analysis also suggests variations in the clinical presentations of infections by *S. sonnei* and *S. flexneri*.

Poster #42

Saving Cells: Retrograde Autologous Priming Reduces Blood Transfusions in Cardiac Surgery

Li, Gabrielle

Background: Coronary artery bypass grafting (CABG) is associated with significant risk of blood transfusions. Efforts to mitigate transfusion include blood conservation strategies such as retrograde autologous priming (RAP). The clinical efficacy of RAP lacks consensus with conflicting results in the literature.

Methods: A retrospective review was conducted on all patients undergoing on-pump, isolated CABG between October 2018 and March 2023 at a single institution. Wilcoxon rank sum and X² analysis were used to analyze continuous and categorical outcomes, respectively. Risk-adjusted multivariable logistic regression was also performed.

Results: Of 1775 patients undergoing CABG during the study period, 1109 met inclusion criteria with 332 (29.9%) receiving RAP. Patients in the RAP group had less total crystalloid use (900mL vs. 1100mL, $p < 0.01$) and lower rates of intraoperative cryoprecipitate transfusion (5.7% vs. 10.8%, $p < 0.01$). Postoperatively, RAP was associated with lower rates of prolonged ventilation (4.5% vs. 8.2%, $p = 0.03$), red blood cell transfusion (16.6% vs. 27.8%, $p < 0.01$), and shorter mean length of stay (6.9 days vs. 8.1 days, $p < 0.01$). On risk-adjusted analysis, RAP was found to significantly reduce the risk of postoperative blood transfusion (OR=0.54, $p < 0.01$) and prolonged ventilation (OR=0.47, $p = 0.02$).

Discussion: The use of RAP may result in fewer blood transfusions and improved outcomes. Potential mechanisms include avoidance of volume overload and transfusion-related acute lung injury. RAP should be considered in appropriately selected patients undergoing cardiac surgery.

Poster #43
Referral Patterns to a Gender Clinic

Link, Courtney

Background: Gender-diverse (GD) youth are increasingly presenting to primary care providers (PCPs) for gender-affirming care and referrals to specialty gender clinics. Using a multimodal phased approach, this study aims to identify areas for improvement in the coordination of care for GD youth and better understand the needs of PCPs supporting these youth. The first phase of this study, described herein, examined referral patterns to a pediatric transgender health clinic serving nonmetropolitan youth.

Methods: Retrospective chart review was performed to examine referrals to the gender clinic at UVA Teen and Young Adult Health Center for patients with an intake appointment between January 2023 and June 2023, inclusive (n= 32). Data were collected on demographics, gender-related health care visits, PCPs, and referral status. Analysis consisted of descriptive statistics and geographic mapping.

Results: Of 32 patients, the average age was 17.5 years. 16% were female-identifying, 59% were male-identifying, and 25% were non-binary-identifying. 81% were assigned female at birth and 19% were assigned male at birth. 38% were referred by a PCP. 22% had a mental health evaluation prior to their intake. Among patients interested in initiating hormone therapy, 36% received a same-day prescription; lack of mental health letter was the most frequently observed reason for prescription delay.

Discussion: These referral trends highlight potential areas for improvement in coordinating the care of GD youth. For example, patients may have experienced less delays in receiving gender-affirming hormone therapy if they had a mental health evaluation prior to their intake. Further research with a larger sample size is needed to determine if referral status is related to delays in care.

Poster #44
A Rare Case of Vasculitis Induced by Crusted Scabies Infection

Lyons, Catherine

Here we present a 70-year-old man who presented with a rare case of cutaneous leukocytoclastic vasculitis (LCV) secondary to a crusted scabies (*Sarcoptes scabiei* var *hominis*) mite infestation. Few cases have been reported in the literature of LCV in association with scabies as LCV is typically caused by a bacterial or viral infection or other malignancy. Since this combination of cutaneous manifestations is rare, diagnosis and treatment may be delayed, allowing for the development of advanced disease.

Poster #45

Akkermansia Muciniphila as a Prophylactic against Deep Vein Thrombosis in a Murine Model

Marcum, William

Background: Deep vein thrombosis (DVT) is a potentially life-threatening condition characterized by the formation of blood clots within deep venous structures, leading to many local and systemic sequelae including pulmonary embolism and post-thrombotic syndrome. Treatment options for DVT are aimed at addressing the condition after development, and there are no current treatment options for PTS. With this discrepancy in mind, this research focused on how exogenous exposure to *Akkermansia Muciniphila*, a member of the human gut microbiome with many known health benefits, affects DVT formation in a murine model.

Methods: We used a murine model to conduct this experiment. Male c57b6/j mice (8-12-week-old) were divided into experimental (n=9) and control (n=8). The experimental group was gavaged for the 7 days preceding DVT induction with *A. Muciniphila* once daily, where the control group was gavaged in a similar fashion with brain heart infusion broth (BHI) used for bacteria culture. A micro-surgical vascular stenosis procedure was performed, and sample collection was carried out on day two post-procedure. Inferior vena cava samples were subjected to histological (H&E) and immunofluorescent staining (endoplasmic reticulum stress marker, PERK), followed by analysis using ImageJ to quantify PERK activation intensity and document clot formation.

Results: We found that mice pretreated with *A. Muciniphila* developed fewer gross clots and exhibited a significant decrease in PERK activation as compared to mice in the control arm ($P = .0051$).

Discussion: This study supports the potential use of *Akkermansia Muciniphila* probiotic therapy as a prophylactic for DVT formation. We aim to expand our scope by looking at the effect of this treatment on post-thrombotic syndrome.

Poster #46

Transgender Youth Capacity to Consent to Hormone Based Gender-Affirming Care: A Narrative Review

Marino, Loren

Background: Transgender (trans) youth often seek gender-affirming healthcare services as part of their transition. In order to obtain these services, current guidelines recommend that youth demonstrate medical decision-making capacity (DMC). However, this raises questions about how best to evaluate DMC and what ethical concerns might arise. This review aims to identify standards for assessing DMC and the ethical concerns of multiple stakeholder perspectives to guide and improve clinical practices surrounding DMC assessments.

Methods: A non-systematic narrative review of literature surrounding youth DMC was initially performed, then narrowed in scope to focus on trans youth. Articles were reviewed thematically

to determine common topics. These included: ethical concerns surrounding trans youth DMC, stakeholder perspectives, assessments of DCM, shared decision-making, and clinical recommendations for DMC assessments.

Results: 27 relevant articles were identified. Ethical concerns in most articles included: respect for autonomy, long term risks and uncertainty of treatment effects, de-transitioning, regret, and youth neurodevelopmental considerations. Articles identified shared decision-making, adequate time to deliberate, and developmentally-appropriate materials as important. Eight studies directly evaluated youth DMC, suggesting the MacArthur Competence Assessment Tool for Treatment (MacCAT-T) could feasibly assess DMC in minors. One study demonstrated that 93.2% of trans youth possessed DMC using the MacCAT-T.

Discussion: For gender-affirming care providers, the need to assess DMC may raise ethical concerns. The MacCAT-T and ethics support tools may prove useful, in conjunction with shared decision-making and consideration of youth developmental abilities. Ultimately, a standardized, collaborative approach to assessing trans youth DMC would benefit youth and their parents, and likely alleviate ethical concerns.

Poster #47

Investigating the utility of dual-energy CT in the differentiation of anatomic sites during cancer treatment

Mathur, Surbhi

Background: Dual-energy CT (DECT) is a currently underutilized imaging technique in radiation oncology. As a specialty in which differentiation between normal tissue and tumor is of utmost importance, DECT shows promise to be an effective tool in cancer treatment. DECT utilizes two different X-ray energy spectra to evaluate changes in material attenuation.

Methods: We received surveys from attending physicians and residents comparing the image quality of different energies: non-contrast, 40 keV, 60 keV, and 70 keV. The 70 keV setting acted as a surrogate control for a regular CT scan. For each, the quality of various structures and tumors was assessed according to four categories: poor (1), fair (2), good (3), and excellent (4), which were compared via a one-way ANOVA test. Additionally, a post-hoc Tukey Test was conducted to analyze which settings' means varied in comparison to one another.

Results: With a significance value of $p < 0.00001$ given a 95% confidence interval, it can be determined there is significant variation in the mean response values for each survey ($n = 12$). Additionally, the 60 keV setting performed better than all three other settings it was compared to. The 70 keV control performed worse than the 40 and 60 keV settings.

Discussion: Of the settings with contrast, the control of 70 keV performed worst, indicating DECT has greater diagnostic value according to residents and attendings' perceptions than regular CT. Across the board, the 60 keV setting performed significantly better than non-contrast, 40 keV, and 70 keV, suggesting it is the most ideal setting to implement with DECT.

Poster #48

Are Breastmilk Vitamin B3 Concentrations Associated with Childhood Growth and Development? A Secondary Analysis of the Early Life Interventions in Childhood Growth and Development In Tanzania (ELICIT) Study

Mazzoni, Gabrielle

Background: Haydom, Tanzania has high rates of stunting, with 50% of children age 18 months having a height below the 3rd percentile. The diet in Haydom is maize-based, with low bioavailability of tryptophan, a precursor to niacin. Abnormalities in this pathway have been implicated in growth delays and intestinal inflammation during enteric infection. The ELICIT trial in Haydom was a 2 × 2 factorial randomized controlled trial assessing the effects of daily nicotinamide and scheduled antimicrobials on childhood growth age 0-18 months.

Methods: This was a secondary analysis of ELICIT data, focusing on the effects of nicotinamide supplementation on child growth. Nicotinamide or placebo was given daily to mothers as the children breastfed exclusively through age 6 months. The data were analyzed using SAS to assess whether breastmilk vitamin concentrations were associated with growth outcomes.

Results: Analysis of the breastmilk demonstrated that the group receiving nicotinamide had higher concentrations of B3 vitamers. Linear regression of breastmilk vitamin B3 on height, weight, and head circumference revealed that higher concentrations of B3 were not correlated with better outcomes. Cognitive development was assessed using the MDAT and was found to have a statistically significant weak inverse association with vitamin B3 at 1 month.

Discussion: Analysis confirmed that the nicotinamide treatment was indeed delivered to the children via breastmilk. Linear regression of vitamin B3 showed that breastmilk concentration of vitamin B3 had no significant association on growth outcomes. Further analysis is needed to determine if breastmilk B3 concentration was associated with enteric pathogens carriage in the cohort.

Poster # 49

Impaired Diastolic Function and Cardiorespiratory Fitness in patients with recent ST-Segment Elevation Myocardial Infarction

Mbualungu, James

Background: Patients with recent STEMI are at risk of decreased diastolic function, and the pathophysiology behind this is not fully understood. An impaired diastolic function at rest and stress could help explain the reduction in cardiorespiratory fitness (CRF) in patients with recent STEMI, independent of systolic function.

Methods: We identified 32 patients 19 [59%] males, 59 [49-65] years, 5 [16%] Black or African American 6 weeks following STEMI. We measured left ventricular ejection fraction (LVEF), e' average, a measure of lusitropy, and E/e', an estimate for left ventricular diastolic pressure, at rest and after exercise stress at echocardiography and peak oxygen consumption (pVO₂) and the slope of the ratio of minute ventilation and carbon dioxide production (VE/VCO₂) at

cardiopulmonary exercise testing. Data expressed as median and interquartile range, and correlations assessed using Spearman test.

Results: LVEF was 53.5 [50.8-58.7]%, average e' velocity was 8.9 [7.2-10.2]cm/s at rest and 13.2 [10.2-15.9]cm/s after exercise. Peak $\dot{V}O_2$ was 17 [15.7-25.4]mLO₂ ·kg⁻¹·min⁻¹. E' velocity at rest and with exercise significantly correlated with $p\dot{V}O_2$ ($R = +0.382$, $p = 0.031$, $R = 0.417$, $p = 0.018$, respectively) while LVEF did not ($R = -0.136$, $p = 0.458$). E' velocity at rest also negatively correlated with $VE/\dot{V}CO_2$ slope ($R = -0.360$, $p < 0.043$). E/e' ratio at rest and with exercise did not correlate with $p\dot{V}O_2$ nor $VE/\dot{V}CO_2$ slope.

Discussion: Impaired myocardial relaxation at rest and with exercise is associated with impaired aerobic exercise capacity in patients with recent STEMI. Future studies are needed to improve myocardial lusitropy after STEMI and address how such improvements may result in improved CRF.

Poster # 50

Immunoglobulin G4 (IgG4) & Milk In Vitro Immune Complex Formation

Meyers, Derek

Background: Immunoglobulin G4 (IgG4) is known to bind milk proteins in the esophageal tissue of patients with active eosinophilic esophagitis (EoE). However, the role these complexes play in the EoE inflammatory response is unknown. The purpose of this study was to determine the optimal concentration of milk-specific IgG4 antibodies necessary to form immune complexes in vitro.

Methods: 96-well plates were coated overnight with 0.5 μ g milk protein. Human monoclonal IgG4 antibodies (mAb) shown to bind milk at higher or lower affinities (1F8 & 3D4, respectively) were added to the plates at 37°C for 1 hour at various ratios of milk:mAb (100:1, 50:1, 25:1, 10:1, 1:1, 1:10, 1:25, 1:50, 1:100). Each experimental condition was run in triplicate. Secondary antibodies directed against human IgG4 were then added. ELISAs were performed and absorbance @ 450 nm was measured using an ELISA plate reader.

Results: Absorbance (abs) @ 450 nm was significantly greater than the background for all trials of 1F8 mAb alone, 3D4 mAb alone, & 1F8:3D4 in combination. Absorbance plateaued at the milk:mAb 10:1 ratio (0.609 abs), the 1:1 milk:mAb ratio (0.448 abs), and 1:10 milk:mAb ratio (0.441 abs), for 1F8, 3D4:1F8, and the 3D4 trials, respectively.

Discussion: These results suggests that a ratio of 10:1, 1:1, & 1:10 were optimal binding concentrations for IgG4-milk immune complex formation for 1F8, 1F8:3D4, & 3D4, respectively. This information will be used to further study the role of IgG4 in the EoE inflammatory response via in vitro eosinophil stimulation assays.

Poster #51

How should mindfulness therapy be designed for autistic adults with intellectual disability (ID), according to them and their allies? A qualitative interview study

Miao, Lucille

Background: An estimated 30% of autistic adults also have co-occurring intellectual disability. Autistic adults with intellectual disability are at higher risk for mental health disorders when compared to the general population, autistic adults, and adults with intellectual disability. Recent reviews found that mindfulness interventions significantly increased subjective well-being in autistic adults. However, there is limited research about mindfulness interventions in autistic adults with intellectual disability. This study aims to understand autistic adults with intellectual disability and their allies' perspectives on mindfulness therapy, a potential mental health treatment with autistic adults with intellectual disability.

Methods: Semi-structured qualitative interviews were conducted with four autistic adults with intellectual disability, ten autistic adults, and eight primary caregivers of autistic adults with intellectual disability. Interviews explored participants' coping strategies, previous experiences with mindfulness therapy, and preferences for learning mindfulness therapy.

Results: Five primary themes emerged: (1) preference for brief, goal-directed mindfulness activities; (2) use of movement-based, creative, and sensory activities as relaxation strategies; (3) preference for knowledgeable therapists, who can enable client autonomy; (4) preference for reminders and visual and audio aids to help learn mindfulness; (5) belief that mindfulness therapy should be individualized to the client.

Discussion: This qualitative study suggests a mindfulness intervention for autistic adults with intellectual disability should focus on brief mindfulness activities, incorporate relaxation strategies like exercise and creative and sensory pursuits, and include visual and audio aids to teach mindfulness.

Poster #52

Analyzing Reasons for Clinical Deterioration Leading to ICU Transfer

Mullapudi, Abhishek

Background: The COVID-19 pandemic has played a tremendous role in shaping healthcare and has prompted discussions of how medical practices, patient populations, and the nature of patient illnesses might have changed. However, the examination of patients in the UVA Cardiology department in 2023, revealed a similar distribution of reasons for ICU transfer as patients in 2020, prior to the pandemic.

Methods: From patients in the adult acute care cardiac and cardiovascular surgery ward at the University of Virginia Hospital, I manually reviewed the charts of 234 patients who were transferred to the ICU due to clinical deterioration. Using clinical definitions from the prior 2020 Blackwell et al., study, and guidance from my mentors, Drs. Oliver Monfredi and Randall Moorman, I classified reasons for deterioration and reviewed each patient record thoroughly, paying specific attention to the 48 hours prior to and following ICU transfer (1).

Results: Of the patients in the study, the most common indication for ICU transfer was respiratory instability. This was followed by arrhythmia and infection. Amongst 7 broad categories of clinical deterioration, the order in terms of gross counts resembles the Blackwell study.

Discussion: This project aimed to validate the patterns of clinical deterioration leading to ICU transfer that was seen in the prior study. The data from this project largely affirmed those results, and showed that despite the pandemic, the reasons for clinical deterioration have remained similar.

References: Blackwell JN, Keim-Malpass J, Clark MT, et al: Early Detection of In-Patient Deterioration: One Prediction Model Does Not Fit All. *Critical Care Explorations* 2020; 2:e0116

Poster #53

Recombinant Human Bone Morphogenetic Protein-2 (rhBMP-2) as an alternative to autologous bone graft in pediatric craniofacial reconstruction: A systematic review

Murad, Laiba

Background: Pediatric craniofacial reconstruction is often accomplished through autologous bone grafts. rhBMP-2 has some potential as a substitute, sparing patients from donor-site morbidity. This review assesses whether rhBMP-2 can serve as an appropriate alternative.

Methods: A literature search was conducted via Pubmed/Medline, Ovid, and Web of Science for publications between January 2008 and May 2023. Included were RCTs, prospective or retrospective case series, and case reports on pediatric craniofacial reconstruction with rhBMP-2 grafting.

Results: 211 articles were screened. 6 RCTs, 2 longitudinal prospective studies, 10 retrospective comparative studies, and 3 case reports were included. Among 21 included studies, 18 utilized rhBMP-2 for alveolar cleft repair. Iliac crest bone graft (ICBG) patients were designated as controls. rhBMP-2 grafting and ICBG were compared based on osteogenic efficacy, complications, operative time, hospitalization time, and cost. Among 12 studies comparing osteogenesis, 4 favored rhBMP-2, 1 favored ICBG, and 7 showed no difference. Among 11 studies evaluating complication rates, 5 favored rhBMP-2, 2 favored ICBG, and 4 showed no difference. rhBMP-2 was frequently associated with facial edema, and ICBG was frequently associated with donor-site morbidity. 5 studies compared OR time, and all 5 favored rhBMP-2. Among 8 studies comparing hospitalization time, 7 favored rhBMP-2, and 1 showed no difference. Among 4 studies comparing cost burden, 2 favored rhBMP-2, 1 favored ICBG, and 1 reported no difference.

Discussion: With regard to osteogenesis, complications, hospital resources, and costs, it can be concluded that rhBMP-2 may serve as an appropriate alternative to ICBG in pediatric alveolar cleft repair. However, its use in other craniofacial reconstruction procedures, such as calvarial or mandibular defect repair, warrants further study.

Poster #54

Trends in U.S. Poison Center Data Involving Hallucinogenic Mushrooms

Murray, Austin

Background: Since May 2019, several U.S. cities and states have taken steps to decriminalize the possession, use, and cultivation of psilocybin-containing mushrooms. A retrospective review of the National Poison Data System (NPDS) database was conducted to understand trends of hallucinogenic mushrooms poisoning during the last 10 years, as reported to U.S. poison centers.

Methods: The National Poison Data System was queried for cases involving exposure to hallucinogenic mushrooms during January 1, 2013 - December 31, 2022. Persons aged 13-25 years were included. Trends in frequency were analyzed using Poisson regression methods. Single substance cases were examined by clinical effects, level of care provided, and medical outcome.

Results: During January 1, 2013-December 31, 2022, a total of 6,840 hallucinogenic mushrooms associated cases were reported to U.S. PCs (Table), 4,649 (68.0%) being single substance exposures. Most exposures occurred among teenagers, ages 13-19 years old (34.7%) and adults, ages 20-29 years (33.3%). Intentional abuse and misuse were reported in 75.2% of the cases. Overall, 63.5% of single substance exposures received medical attention and 11.4% resulted in hospital admission. In 2022, the number of hallucinogenic mushroom poisonings reported to PCs more than tripled compared to the period 2013-2018.

Discussion: One third of the cases occurred among teenagers aged 13-19 years, which is alarming given the exponential increase in usage, and that possession and consumption by individuals under 21 is illegal in all US cities. Continued trend monitoring is critical to determine the impact of decriminalization and legalization on specific substance use trends, especially among youth.

Poster #55

Impact of closure devices on clinical outcomes following catheter-directed thrombolysis for acute lower extremity arterial occlusions

Nguyen, Joseph

Background: Catheter-directed thrombolysis (CDT) is a common treatment for acute lower extremity arterial occlusions. Due to the use of intra-procedural thrombolytics and anticoagulation, and the need to immediately anticoagulate after CDT, there is clinical interest in using closure devices, even after 24-72 hours of common femoral access. We evaluate whether the use of manual pressure, Angioseal, or other closure devices affects clinical outcomes.

Methods: Retrospective chart review of 377 cases of CDT at an academic medical center from 2007-2021. Inclusion criteria were acute lower extremity arterial occlusion treated with CDT and closure done via manual pressure, Angioseal, or other device.

Results: The primary method of closure was manual pressure in 264 cases (70.0%), Angioseal in 75 cases (19.9%), and another closure device in 38 cases (10.0%). Median age was 62 and

60.7% of patients were male. There was no difference in the rate of major bleeding ($p=0.960$), minor bleeding ($p=0.234$), access site hematoma ($p=0.976$), groin pseudoaneurysm formation ($p=0.903$), groin infection ($p=0.650$), or post-procedure length of stay ($p=0.589$) between the three methods. Mean lysis duration was 31.2 hours, and there was no difference in any complications between the methods when stratified by lysis duration (<36 vs ≥ 36 hours).

Discussion: There was no difference between manual pressure, Angioseal, and other closure methods regarding major or minor bleeding, access site hematoma, groin pseudoaneurysm formation, groin infection, or post-procedure length of stay, even when stratified by lysis duration. Angioseal and other closure devices provide a safe option for closure in patients undergoing lower extremity CDT.

Poster #56

MRI Methods for Quantitative Analysis of the DentatoRubroThalamic Tract in Parkinson's Disease and Essential Tremor treated with Focused Ultrasound (FUS) Thalamotomy

Ott, Garrett

Background: MR-guided Focused Ultrasound (MRgFUS) thalamotomy is a recently approved treatment for patients suffering from essential tremor or Parkinson's disease, and represents a noninvasive alternative to deep brain stimulation (DBS) neurosurgery. Both procedures work by targeting the thalamic portion of the Dentato-Rubro-Thalamic tract (DRTT) involved in relaying the tremor, specifically the ventral intermediate (VIM) nucleus. However, methods to reliably quantify changes in the Dentate and Red (Ruber) nuclei of the DRTT in Parkinson's, Essential tremor, pre and post MRgFUS thalamotomy remain an active area of research.

Objective: To develop reliable MR methods for quantitative analysis of the Dentate and Red nuclei of the DRTT pre and post MRgFUS in Parkinson's and Essential Tremor.

Methods: T1, T2, and diffusion MRI were acquired on 50 patients with Parkinson's or Essential Tremor pre and post treatment with MRgFUS at Brigham and Women's Hospital. Red and Dentate nuclei were compared across MR sequences. B0 diffusion MRI was selected to best quantify volumetric changes in the nuclei, and the DRTT via fiber tractography. Regions of interest (ROIs) consisting of the left and right Red and Dentate nuclei were then manually segmented and compared using a custom SPINE workflow. Volumetric ROIs for the Red and Dentate nuclei were input as seeds into MRTrax for fiber tractography of the DRTT.

Results: The study is ongoing and data analysis is not yet complete. The investigators remain blinded to results.

Discussion: Diffusion MRI and fiber tractography are valuable noninvasive techniques for quantitative analysis of the Red and Dentate nuclei. In future analysis, we hope to quantify changes in the DRTT in Parkinson's and Essential Tremor, pre- and post-MRgFUS thalamotomy.

Poster #57

Evaluating how design-thinking education fulfills core competencies of medical education

Pallinti, Pranavi

Background: Design-thinking is a problem-solving methodology focusing on developing empathy for user-needs to inform approaches to complex problems. It is used extensively in business and engineering to develop new products and services. A growing number of medical schools see design-thinking as a potentially useful pedagogy to help future physicians build the skills, mindsets, and confidence necessary to take on complex systems-based challenges.

Methods: This project aimed to help formalize the application of design-thinking in medical education. A comprehensive literature review of case studies and evaluation of institutional design-thinking and medicine programs was conducted to accomplish this. Results of this review were then synthesized and used as the basis for a formal mapping of embedded skills and problem-solving approaches in design-thinking to core competencies targeted by national standard groups in the United States for undergraduate medical training.

Results: The analysis highlights that while an increasing number of medical schools are teaching aspects of design-thinking aspects, programs are generally taught without a formalized curriculum. Commonly taught principles of design-thinking incorporated into medical school programs include identification of user-needs (empathy), productive brainstorming (ideation), use of low-fidelity prototypes to test early insights, synthesis of qualitative and quantitative data, and field testing. The competency mapping exercise demonstrates that these and other design thinking principles and techniques map to core competencies of medical education such as practice-based learning, systems-based practice, and interprofessional collaboration.

Discussion: The literature review results demonstrate strong potential to apply aspects of design-thinking to help medical students achieve national competencies for future physicians.

Poster #58

Approaches to Posterior Fossa Decompressions in Stroke Patients

Patel, Romil

Background: Posterior fossa decompression (also known as a suboccipital craniectomy) is a procedure most commonly used for Chiari malformation, but it can also help treat cerebellar infarctions. This study compares two different approaches to a suboccipital craniectomy (midline vs. lateral) in terms of anatomical and functional differences.

Methods: Patients who underwent a posterior fossa decompression due to a recent stroke were analyzed. Data collected from each patient included postoperative outcomes, quantitative scores based on the National Institutes of Health Stroke Scale (NIHSS) and Glasgow Coma Scale (GCS), and the area of bone removed during each craniectomy. The sample included a total of 22 stroke patients who underwent a posterior fossa decompressive surgery at the University of Virginia Health System. Statistical analyses of the data were performed using Fisher's Exact test and Wilcoxon Rank Sum test.

Results: There were no significant differences between midline and lateral suboccipital craniectomies in terms of postoperative improvement in fourth ventricular mass effect ($p=1$) and hydrocephalus ($p=1$), area of craniectomy ($p=0.29$), and change in GCS score ($p=0.39$).

Discussion: No significant differences between the two types of suboccipital craniectomies in terms of the measured outcomes were illustrated. The lack of major differences may highlight how surgeons should consider and use either approach depending on specific factors of the case. Further research is needed to distinguish any potential differences between midline and lateral suboccipital craniectomies, and additional factors, such as intraoperative complications and postoperative neurological functioning, should be investigated.

Poster # 59

Assessing Primary Care Physicians' Knowledge and Comfort Level Managing Patients Fasting during Ramadan

Pazhwak, Bobby

Background: Fasting during the month of Ramadan is one of the five Pillars of Islam observed by Muslims around the world. During Ramadan, participating Muslims abstain from ingesting substances, including food, water, and medication, from sunrise to sunset. This practice has been associated with both positive and negative health outcomes depending on the patient population. This study aimed to evaluate the knowledge of Ramadan fasting among primary care physicians (PCPs) within the University of Virginia (UVA) Health System and assess their self-reported comfort level managing fasting patients.

Methods: A 16-question self-administered online survey was distributed to 116 PCPs associated with UVA. The 16 survey questions were divided into 6 categories: Knowledge (6 questions), Comfort Level (3 questions), Perception (2 questions), Practice Behaviors (2 questions), Training/Resources (2 questions), and Open Comments (1 questions). Responses were analyzed using descriptive statistics.

Results: The results of this study demonstrate that few PCPs (14%; $n=5$) were able to correctly answer all 6 basic knowledge questions about Ramadan despite recognizing the medical importance of Ramadan. Only 40% ($n=14$) of respondents strongly or somewhat agreed that they received adequate training on how to manage patients fasting during Ramadan.

Discussion: There is a clear discrepancy between PCP's self-reported comfort level caring for patients fasting during Ramadan and their basic knowledge of Ramadan fasting. Furthermore, current medical education may be inadequately preparing PCPs to meet the healthcare needs of Muslim patients. More research is needed to qualify these results and identify particular areas where knowledge may lack.

Poster #60

Novel grading system for CADASIL severity: A multicenter cross-sectional study

Petrosian, Derek

Background: Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) is an inherited progressive cerebral microangiopathy with considerable phenotypic variability. This study aimed to describe the generalizability of a recently proposed grading system of CADASIL across multiple centers in the United States.

Methods: Electronic medical records (EMR) of an initial neurological assessment of adult patients with confirmed CADASIL were reviewed across 5 tertiary referral medical centers with expertise in CADASIL. Demographic, vascular risk factors, and neuroimaging data were abstracted from EMR. Patients were categorized into groups according to the proposed grading system: Grade 0 (asymptomatic), Grade 1 (migraine only), Grade 2 (stroke, TIA, or MCI), Grade 3 (gait assistance or dementia), and Grade 4 (bedbound or end-stage). Inter-rater reliability (IRR) of grading was tested in a subset of cases.

Results: We identified 138 patients with a mean age of 50.9 ± 13.1 years, and 57.2% were female. The IRR was acceptable over 33 cases ($\kappa=0.855$, SD 0.078, $p<0.001$) with 81.8% being concordant. There were 15 patients (10.9%) with Grade 0, 50 (36.2%) with Grade 1, 61 (44.2%) with Grade 2, 12 (8.7%) with Grade 3, and none with Grade 4. Patients with a lower severity grade (grade 0 vs 3) tended to be younger (49.5 vs. 61.9 years) and had a lower prevalence of hypertension (50% vs. 20%, $p = 0.027$) and diabetes mellitus (0% vs. 25%, $p = 0.018$). A higher severity grade was associated with an increased number of vascular risk factors ($p = 0.02$) and independently associated with hypertension and diabetes ($p<0.05$). Comparing Grade 0 vs. 3, cortical thickness tended to be greater (2.06 vs. 1.87 mm; $p = 0.06$) and white matter hyperintensity volume tended to be lower (54.7 vs. 72.5 ml; $p = 0.73$), but the differences did not reach significance.

Discussion: The CADASIL severity grading system is a pragmatic tool for characterizing CADASIL phenotype that doesn't require testing beyond that done in standard clinical practice. Higher severity grades tended to have a higher vascular risk factor burden. This system offers a simple method of categorizing CADASIL patients which may help describe populations in observational/interventional studies.

Poster #61

Advancing Interventional Radiology Training through 3D Printed Molds

Purohit, Nidhi

Background: The integration of 3D printing in medical education has resulted in a rapidly growing field of hands-on, immersive learning experiences. Within the field of IR, simulation training provides trainees the opportunity to practice in a risk-free environment while providing tactile feedback, an easier way to understand the spatial relations between anatomical structures, and procedural realism. Although there are numerous commercially available models for hands-on education, 3D printing provides an avenue for the creation of endlessly customizable models with varying anatomies, pathologies, and scenarios for all levels of training

and education. Specifically, resin printing allows for a more accurate, detailed, and smoother model when compared to traditional extrusion printing.

Methods: This exhibit will describe the methods for creating a relatively low-cost model for practicing ultrasound-guided femoral vein and upper-arm vein access. Resin printers make possible the creation of smooth-walled molds that can include hollow structures such as arteries, veins, or bile ducts. Ballistics gel poured into these molds creates a surrounding soft tissue structure. After removing the cooled gel from the mold, Penrose drains are inserted to create pressurized vessel walls, and PVC pipes are used to create bone cortex. Using anatomical proportions, a 3D model was created and tested.

Results: One mold was able to create multiple models, convenient for large group teaching and easily rebuilding gel models that develop air artifacts. This technique can create models to simulate a variety of procedures such as ultrasound-guided arterial or venous access and fluoroscopically-guided catheterizations with various levels of difficulty.

Discussion: Hands-on simulation training remains a critical method for learning IR skills. Femoral and arm vein access models can be created using relatively inexpensive materials. Educators can create and share computer designs for local 3D printing using increasingly accessible resin printers, allowing greater access to simulation.

Poster #62

Controlling the Controller: Identification of Novel Enhancers of the Key Hematopoietic TF PU.1

Qiu, Kevin

Background: The ETS transcription factor PU.1 plays a central role in driving hematopoietic cell development and is required for B and myeloid immune cell maturation. Aberrant PU.1 expression through dysregulation of non-coding enhancer regions has been implicated in hematological malignancies. One example is seen in RUNX1-ETO AML, in which the fusion protein sequesters a key enhancer, the Upstream Regulatory Element (URE), thus driving oncogenesis. This underscores the need to identify and classify enhancers regulating PU.1 expression to better characterize its nuanced yet vital role in normal hematopoiesis and disease.

Methods: We identified putative enhancer regions by comparing homologous regions between the human genome and 100 other vertebrates using UCSC Genome Browser. We then acquired publicly available genomic profiles, including single-cell multi-ome, ATAC, ChIP, and Hi-C sequencing datasets, of human myeloid, B, T, and erythroid cells. After preprocessing, we profiled the epigenetic characteristics of the URE and our putative enhancer regions using chromatin accessibility, histone binding, and DNA-DNA interactions.

Results: We confirmed the enhancer properties of the URE region by confirming high DNA accessibility, H3K27ac histone binding, and contact with the PU.1 promoter specifically in myeloid cells. Using this signature, we identify two additional regions 10kb and 13kb upstream with a similar accessibility and histone profile, including the latter which also maintains DNA contact with the PU.1 promoter.

Discussion: We applied a bottom-up epigenetic model of enhancer activity to identify two previously unreported enhancer regions of PU.1, thus allowing for targeted ablation studies and evaluation in the context of hematological disease.

Poster #63

Research Study Characteristics Associated with Media Engagement in Hip and Knee Arthroplasty Database Studies

Ranjha, Shahroze

Background: The number of hip and knee arthroplasty research publications using databases is growing, with some attracting more media interest than others. This study identified associations between a study's media engagement, measured by its Altmetric Attention Score (AAS) or the number of times it was posted on X, with article characteristics such as the topic or publishing journal.

Methods: Hip and knee arthroplasty studies using multi-institutional databases published in 2020 in BJJ, CORR, JBJS, and JOA were identified. Articles were assigned one of the following topics: complications and outcomes, technology, medications and/or anesthesia, logistics, and surgical techniques. AAS and X posts for each article were retrieved. Kruskal-Wallis tests were used to identify differences in the AAS and number of X posts across journals and topics.

Results: Kruskal-Wallis tests revealed a difference between an article's publishing journal and its AAS ($p = 0.034$) and number of X posts ($p = 0.032$), with articles published in the BJJ having the greatest mean AAS (16.27) and X posts (25.73). Kruskal-Wallis tests showed a difference between an article's topic and its AAS ($p = 0.001$) and number of X posts ($p = 0.027$), with articles focused on surgical techniques having the greatest mean AAS (26.50) and X posts (37.00).

Discussion: There is significant variation in the degree of media engagement for hip and knee arthroplasty database studies. In articles published in 2020, the topic (surgical techniques) and journal of publication (BJJ) were associated with a greater level of engagement.

Poster #64

Investigating Inflammasome Inhibition as a Novel Treatment for Alzheimer's Disease in the 5xFAD Mouse Model

Reddy, Vishal

Background: Alzheimer's disease (AD) is one of the most common health conditions affecting the elderly. AD, an inflammatory disease characterized by amyloid- β plaque deposition in the brain, is thought to be driven by inflammasome activation. We studied 3SQ, a novel inflammasome inhibitor, in 5xFAD mice, a widely-used model for studying AD. It is well-established that 5xFAD mice exhibit impaired spatial learning and memory formation. We sought to determine whether previous findings by the Ambati lab, i.e., that 3SQ treatment

improved cognitive deficits in 5xFAD mice, were correlated with immunohistochemical changes in various brain regions.

Methods: Starting at an age of 5.5 months, 5xFAD mice were treated with 3SQ (60 mg/kg) or PBS (vehicle) for 3 months. At 5.5 months (untreated), and 8.5 months, 6 mice/group were sacrificed, and their brains were removed and embedded in paraffin blocks. Parasagittal sections were then made at a thickness of 7 microns. Immunohistochemical staining was performed for amyloid- β in the hippocampus, frontal cortex, and motor cortex. Images were obtained using a confocal microscope (Nikon A1R) and quantified using ImageJ.

Results: 5xFAD mice at 8.5 months of age had significantly more amyloid- β deposits compared to 5xFAD mice at 5.5 months. Furthermore, 3SQ-treated mice had significantly less amyloid- β deposits compared to PBS-treated mice in the hippocampus, frontal cortex, and motor cortex.

Discussion: Immune response via the inflammasome is implicated in AD pathology. Our studies show that inflammasome inhibition by 3SQ slowed progression of amyloid- β deposition in 5xFAD mice. Inflammasome inhibition can be further explored as a therapy for AD.

Poster #65

Cosmetic or Medical Necessity: The Ethics of Hair Removal in the Context of Gender-Affirming Care

Rischie, Ishaan

Background: Access to “cosmetic” gender-affirming interventions like hair removal is limited for transgender and gender-diverse individuals because these procedures are widely regarded as not medically necessary. However, for transgender and gender-diverse individuals experiencing gender dysphoria, aligning their appearance with their gender identity often involves modification of facial and body hair due to the inherent visibility and societal associations of hair with the gender binary. Thus, inadequate access to gender-affirming hair removal represents a significant unmet healthcare need.

Methods: This narrative review involved an extensive search of scholarly literature to explore the anthropologic basis for associations between hair and gender. A bioethical principlism framework was applied to further analyze relevant literature to determine the ethical considerations of hair removal for gender-affirming care.

Results: Facial and body hair is rooted in social constructs of both race and gender with cisgender women being expected to have less hair. Medicine has played a significant role in maintaining the gendered binary for hair due to its continual pathologization of, and subsequent treatments for, “excess” body hair in cisgender women. These treatments for permanent hair removal have been shown to improve psychosocial outcomes for transgender and gender-diverse patients with gender dysphoria and to be an important prerequisite for gender-affirming surgery, thereby supporting ethical principles of autonomy and beneficence.

Discussion: This ethical analysis of hair and gender highlights the medical necessity of cosmetic hair removal for the treatment of gender dysphoria. Accordingly, insurance policies must ensure adequate coverage of hair removal for patients with gender dysphoria.

Poster #66
Weight Stigma and Outcomes in Primary Care

Royston, Sage

Background: Weight bias is defined as negative attitudes, beliefs, or judgments about a person based on their body size. In medicine, weight is a complex and unique parameter that has both physiological and social implications. The goals of this study are to investigate the relationship between patients' internalized weight bias and their health outcomes.

Methods: The design of the study is observational in nature and will collect two categories of data: biomedical data from chart review and qualitative data in the form of responses to a validated weight stigma questionnaire. The major inclusion criteria are BMI > 25 and age > 18 years old. Data gathered from chart review will include demographics, diagnoses of hypertension and/or type two diabetes mellitus, and last measured hgbA1c, HDL, and LDL levels. Multiple correlational analyses will be performed to examine the relationship between the total survey score and the biomedical variables.

Results: The endpoints of this study will be finding the correlation coefficients between the survey results and the aforementioned variables. Based on the estimated correlational coefficients, the sample size necessary for statistical power is 80 participants.

Discussion: This project has received an initial review by the IRB and is undergoing preparation for the next stage. Finalized results and discussion will be reported following its approval and data collection.

Poster #67
Prescribing Patterns of Prednisone for the Treatment of Sarcoidosis: a single-center retrospective study

Schmidt, Michael A

Background: Sarcoidosis is a chronic granulomatous disease that often presents with involvement of multiple organ systems. Prednisone remains an integral component of treatment. It is important to elucidate what factors influence the treatment patterns of sarcoidosis with prednisone, as the drug can cause significant adverse side effects.

Methods: This is a retrospective study of patients enrolled in the UVA Sarcoidosis Registry (IRB# 20937). Clinical data included demographics, biopsies, extrapulmonary involvement, treatment with steroid-sparing agents, and patterns of prednisone treatment. Patients were grouped into tertiles (T1-T3) based on crude estimates of cumulative prednisone dosing within the first year of treatment. A multinomial logistic regression model was used to estimate the impact of covariates on getting different treatments separately.

Results: 122 patients enrolled between 2019 and 2022 were reviewed. Exclusion criteria: lack of clear and documented prednisone courses for the treatment of sarcoidosis in their medical record. Our study sample included 79 patients. 59.5% of patients identified as white; 40.5% identified as black. Within the first year of treatment, patients were on prednisone for mean of

264 days, with an average initial dose ~40mg. Patients in higher tertiles had higher incidences of side effects related to prednisone. White patients had 86% lower odds to be in the T2 group as compared to the T1 group. Propensity score matching was performed to show the impact of predictors on treatment assignment, with a strict ordering in impact and a trend towards significance.

Discussion: Our preliminary analysis revealed that treatment patterns of sarcoidosis with prednisone vary amongst different patient populations. Further analysis and data collection is required in multi center cohorts.

Poster #68

Intra-procedural Hepatic Perfusion CT for TIPS: A Feasibility Study

Senthilvelan, Jayasuriya

Background: Transjugular Intrahepatic Portosystemic Shunt (TIPS) can risk hepatic encephalopathy. While portosystemic gradient (PSG) is the standard treatment endpoint, it is only a surrogate for true portal perfusion. The purpose of this study is to evaluate the feasibility of intra-procedural perfusion CT for TIPS procedures.

Methods: Two TIPS creation patients and one TIPS revision patient were enrolled. After portal vein access, 20cc of contrast was injected at 10 ml/s into the portal vein. CT perfusion imaging of thickness 3.84 cm centered on the portal vein bifurcation was obtained over 30 seconds. After stent dilatation and PSG measurements, CT perfusion was repeated. Blood Flow (BF) was estimated using the Body Perfusion CT workflow in Siemens syngo.via software.

Results: Technical success was achieved in all patients. The two TIPS creations resulted in PSG reduction from 17 to 12 mmHg (29%) and 15 to 8 mmHg (47%), respectively. Whole liver BF correspondingly dropped from 83.2 to 58.6 ml/100ml/min (30%) and 242.8 to 119.6 ml/100ml/min (50%). The TIPS revision resulted in PSG reduction from 35 to 21 mmHg (40%); whole liver BF increased from 54.2 to 66.7 ml/100ml/min (23%).

Discussion: Intra-procedural perfusion CT during TIPS is feasible and provides a measure of portal perfusion. This pilot study demonstrated a correlation between PSG reduction and whole liver BF for both TIPS creation patients. This was not the case for the TIPS revision patient. Further investigation with a larger sample size is necessary to determine if this difference is related to acute vs. chronic perfusion changes.

Poster #69

Association between area deprivation index and premature infant outcomes and follow-up in the NICU.

Shenoy, Arpitha

Background: The Area Deprivation Index (ADI) measures neighborhood disadvantage using American Census Survey data such as income, education, employment, and housing quality. In a multicenter cohort of extremely premature infants (EP, gestational age <29 weeks), a higher national ADI percentile, or more deprivation, was associated with increased mortality and morbidity in the NICU. These findings demonstrate how pervasively maternal deprivation affects infant outcomes.

Methods: We collected clinical and ADI data for EP infants admitted to UVA from 2018-2020. We compared characteristics of infants below and above the national median ADI using Fisher's-exact tests and t-tests to investigate associations between ADI of EP NICU patients, neurodevelopmental follow-up, and outcomes.

Results: We analyzed 132 infants, of which 120 had ADI data available. More infants had high ADI (59%) than low ADI (41%). Infants with high ADI lived farther from UVA (80.0 vs 45.8 miles, $p<0.05$). More low ADI infants had an inpatient neurodevelopmental consult or referral (61% vs 39%, $p<0.05$). We saw a non-significant trend toward more low ADI infants having any neurodevelopmental follow-up or Early Intervention visit. There was a higher proportion of Black infants in high ADI areas (25% vs. 20%, $p<0.05$). Sex and ethnicity were similar between ADI groups. Sepsis, intraventricular hemorrhage, home oxygen, and necrotizing enterocolitis rates were similar between groups.

Discussion: Area deprivation correlated with neurodevelopmental follow-up referral and distance to UVA but not short-term outcomes. Trends toward lower follow-up rates for infants with low ADI warrant continued analysis.

Poster # 70

Quality of Life following Gastric Cancer Surgery

Shetty, Shreya

Background: Eight per one thousand people in the U.S. will develop gastric cancer in their lifetime. Surgery can be curative in early stages but can cause significant lifestyle changes. While survival and recurrence rates are useful measures of outcomes, quality of life (QoL) following gastric cancer surgery has not been well-studied. Assessing QoL provides information about patients' experiences with their disease, which can influence clinical decision-making.

Methods: This study utilized a mixed methods approach to explore differences in QoL after total and subtotal gastrectomies. Patients in the University of Virginia Cancer Registry (2008-2023) who underwent surgery for gastric cancer were examined. Quantitative measures included validated oncology EORTC QLQ-C30 and gastric cancer-specific QLQ-STO22 questionnaires. Global health status, function and symptom scales were calculated and compared. Qualitative

interviews allowed patients to elaborate, and excerpts underwent thematic analysis by two independent researchers.

Results: Of 278 gastric cancer patients who underwent gastrectomies, 103 are currently living. 55 patients have completed the study, most of whom underwent subtotal gastrectomies (85%) and are mostly Caucasian (91%) and female (54%). Wilcoxon rank sum tests showed a statistically significant difference between total and subtotal gastrectomies only in hair loss ($p=.044$). Inquiry into social activities produced the themes of isolation (33%) and being limited by physical side effects (22%). Participants were often introspective (32%) when asked about how they had reflected upon life following their diagnosis and treatment.

Data collection is ongoing with 48 potential participants left to be enrolled.

Poster #71

The role of periostin in pancreatic ductal adenocarcinoma (PDAC) metastasis

Shukla, Anya

Background: Metastasis is a hallmark of pancreatic ductal adenocarcinoma (PDAC), a highly aggressive and deadly cancer. High levels of periostin, a matricellular protein secreted by cancer-associated fibroblasts (CAFs), is a predictor of liver metastasis and reduced survival in PDAC. Previous work showed that periostin-expressing CAFs promoted the lymphovascular invasion of breast cancer to sentinel lymph nodes, but it is unknown if these periostin-expressing CAFs differentially function in other cancers. We hypothesize that, irrespective of their organotypic-specific location, periostin-expressing CAFs expand via proliferation and remodel collagen fibers in the tumor microenvironment to support PDAC progression, invasion, and metastasis.

Methods: The murine PDAC cell line KPC1-mCherry was orthotopically injected into the pancreas (primary tumor) and spleen (liver metastasis via the portal circulation) of transgenic mice whose periostin+ cells were labeled with a fluorescent marker. Periostin expression was subsequently quantified from the harvested pancreas and liver tissue of the KPC1-injected and sham-injected control mice, as well as PDAC patient-derived xenografts.

Results: Preliminary data shows 10-15 fold expansion of periostin-expressing cells in the KPC1-injected pancreas. KPC1-mCherry micrometastases to the liver are accompanied by numerous periostin-expressing cells while few were detected in metastasis-free liver. Additionally, periostin was enriched in PDAC patient-derived xenografts.

Discussion: Further work needs to be conducted to meet our aims such as 1) depleting periostin+ cells to determine if periostin expression promotes the metastasis of PDAC to the liver, and 2) generating CAFs with mutant periostin isoforms to determine if periostin's ability to bind and align collagen fibers is essential to its role in promoting metastasis.

Poster #72

Examining interventions that aim to enhance TB treatment adherence in Southeast Asia: A systematic review and meta-analysis

Singh, Aditya

Background: Adherence is a barrier to curative treatment of Mycobacterium tuberculosis (TB). There have been numerous interventions focused on increasing TB treatment adherence in Southeast Asia. This systematic review and meta-analysis aimed to compile and evaluate the literature on interventions designed to increase TB treatment adherence in Southeast Asia and their effectiveness.

Methods: We searched Cochrane Library Reviews (CDSR) and Cochrane Library Trials (CENTRAL), Medline, CINAHL, Scopus, and Web of Science from 2000 to 2022. We included studies of any design conducted in Southeast Asia that implemented interventions to increase treatment completion in people diagnosed with TB and assessed completion as an outcome. The heterogeneity across studies was explored by I² statistics. We assessed bias using the Newcastle-Ottawa Scale and Cochrane ROB 2.0. We used a random effects meta-analysis to calculate a pooled risk ratio with 95% confidence intervals.

Results: From 1881 abstracts, we included 14 articles. There were 7198 subjects with 3163 (44%) receiving a TB treatment adherence intervention across eight countries. Interventions included directly observed therapy, text-message reminders, food incentives, and more. The risk ratio, derived from the meta-analysis of eight included studies with a control group and 6618 participants overall, was 1.04 (95% CI 1.01, 1.08; I² = 29%), favoring the interventions over controls with little concern for heterogeneity or risk of bias.

Discussion: The results suggested there is a small, statistically significant benefit of using interventions to promote TB treatment completion. Future research could look at additional strategies and combinations of strategies to promote adherence.

Poster #73

A Novel Frameshift Variation in TNFAIP3 Presenting with Acute Liver Failure

Smith, Aaron

A20 haploinsufficiency (HA20) is an autosomal dominant disorder caused by high-penetrance heterozygous loss-of-function variations in the TNFAIP3 gene (6q23.3, containing 9 exons) that results in an early onset autoinflammatory disease. We describe a 15 year-old female with a novel variation (c.599del, p.Cys200Serfs16) that results in a stop codon in exon 4 (position 16). Our patient initially presented with acute cirrhosis of the liver with ascites and was preliminarily diagnosed with drug-induced lupus secondary to minocycline taken for acne. After further investigation, this diagnosis was changed to HA20. This is the first known case of HA20 causing acute liver failure prompting a transplant. Upon 3 month follow up, the patient presented with no symptoms except ongoing mouth and genital ulcers that continue to respond to colchicine therapy.

Poster #74

Longitudinal Physical and Cognitive Outcomes in Pediatric-Onset Multiple Sclerosis (POMS)

Spirek, Benton

Background: Pediatric-Onset Multiple Sclerosis (POMS) is associated with heightened rates of physical and cognitive impairment, fatigue, and depressive symptoms compared to the general population. While individuals with POMS are considered at risk of decline over time, studies have reported conflicting outcomes, and few have provided long-term insights into the progression of these specific factors beyond a 2-year period.

Methods: Participants with POMS participated in longitudinal assessments, including questionnaires and physical and cognitive performance tests. Data were selected from individuals who had completed testing on at least two separate occasions more than three years apart.

Results: 15 subjects with POMS were followed for an average of 4.87 years between initial and final visit. Compared to their initial encounters, 11 of the 15 (73.3%) demonstrated reduced performance in their two-minute walk, and 12 of 15 (80%) exhibited shorter six-minute walks at final follow-up. With cognitive performance, 6 of 15 (40%) improved on the Symbol Digit Modalities Test (SDMT), while 9 of 15 (60%) improved on the Paced Auditory Serial Addition Test (PASAT). Beck's Depression Scores increased in 8 of 15 participants (53.3%). Of 14 subjects who completed the Multiple Sclerosis Fatigue Severity Scale (MFIS), 10 (71.4%) reported higher levels of fatigue.

Discussion: Our results highlight the variable course of POMS, though suggest that physical performance and fatigue may be more susceptible to decline over time compared to cognitive performance and depressive symptoms. Further research is warranted to explore the underlying factors contributing to the differential progression of these aspects in POMS.

Poster #75

Breast-48: High intensity focused ultrasound (HIFU) and Pembrolizumab in metastatic breast cancer

Tessa Tonleu, Joselyne

Background: Pembrolizumab, a monoclonal antibody to PD-1, has led to improved clinical outcomes in triple negative breast cancer patients. High intensity Focused Ultrasound (HIFU) has been associated with an increase in circulating antigen-primed T-cells. HIFU may improve the action of Pembrolizumab by improving tumor antigen presentation.

Methods: Thirteen patients (mean±SD: 53.2±10.9) with metastatic breast cancer were randomized into one of two arms. Arm A received 200mg of pembrolizumab on days 22, 43, and 64. Arm B received 200mg of pembrolizumab on days 1, 22, 43 and 64. On day 15 both arms received HIFU thermal ablation of their tumor. Biopsies were completed on days 1 and 22 and evaluated as part of the immunologic correlative studies. Primary end points were the change in

the CD4:CD8 ratio in the ablation zone and the safety of the combination treatment. Overall Survival (OS), progression-free survival (PFS), and distant response were secondary.

Results: Six patients were enrolled into arm A while seven were in Arm B. In this intention-to-treat population, the OS was 18 months and PFS was four months. Results of tumor analyses showed an overall reduction in CD8/FoxP3 and CD8/CD56 ratios pre- to post-ablation (mean \pm SD: -1.87 ± 48.3 and -1.51 ± 15.1 , respectively). Adverse events (AEs) reported in this study ranged from Grade 1-3. Treatment related Grade 3 AEs include elevated ALT, ALP, and AST alongside hyperthyroidism.

Conclusion: Pembrolizumab in combination with HIFU was safe and cause a favorable alteration in the tumor infiltrating lymphocytes in the microenvironment in metastatic breast cancer patients.

Poster #76

Biologically effective dose and prediction of obliteration of arteriovenous malformations in pediatric patients treated by Gamma Knife radiosurgery

Tewari, Anant

Background: Stereotactic radiosurgery (SRS) represents an effective treatment for pediatric arteriovenous malformations (AVMs). Biologic effective dose (BED) has shown promising results in two previous studies as a predictive variable for outcomes in adults, but its role has never been studied in pediatric outcomes.

Methods: Retrospective data for ≤ 18 years old patients treated with a single-session SRS for AVMs was collected from 1989–2019. BED calculations were performed using an a/b ratio of 2.47. Kaplan-Meier analysis was used to evaluate obliteration, new hemorrhage and radiation-induced changes (RIC). Cox-regression analysis was used for obliteration prediction using two models (margin dose versus BED).

Results: 197 patients [median age=13.1 years] were included; 72.6% (143/197) of them presented initially with spontaneous hemorrhage. A median margin dose of 22Gy with a median BED of 183.2Gy were used to treat AVM with a median volume of 2.8cm³. Following SRS, obliteration was confirmed in 115/197 of patients (58.4%) using MRI and angiography at a median follow-up of 2.85years. The cumulative obliteration probability was 43.6%, 60.5%, 66.0% at 3, 5 and 10years respectively. In Cox multivariate analysis, a BED >180Gy [p=0.002] in model 1, and a margin dose >20Gy [p=0.019] in model 2, were associated with obliteration. An AVM nidus volume >4cm³ was associated with lower obliteration rates in both models. The probability of symptomatic RIC at 10years was 8.6%. Neither BED nor margin dose were associated with RIC occurrence, with the only predictive factor being deep AVM location [p=0.048].

Discussion: This study confirms BED as a predictor for pediatric AVM obliteration. Optimization of BED in pediatric AVM SRS planning may improve cumulative obliteration rates.

Poster #77

Effect of Lactate Transport Inhibition on Hepatocellular Carcinoma Viability in a Woodchuck WHV Model

Venkat, Shreya

Background: Woodchucks are a human hepatocellular carcinoma (HCC) model due to the similarities between woodchuck hepatitis virus (WHV) and human hepatitis B virus (HBV). Transarterial catheter embolization (TACE) is a HCC treatment where embolic particles are injected into a tumor's arterial supply. Caffeic acid (CA), which inhibits lactate efflux, can be added to TACE to enhance hypoxic efficacy. Building upon previous investigation, we created a system to measure treatment efficacy by differentiating tumor viability from tumor volume. We evaluated the efficacy of lipiodol and CA TACE treatment compared to normal saline or lipiodol in a woodchuck model.

Methods: Woodchucks inoculated with WHV were divided into three embolic treatment groups: normal saline control, lipiodol, and lipiodol and CA. Tumor volume and perfusion were measured by T1 MRI and MATLAB ROI analysis before treatment and monthly for six months following treatment.

Results: The control group and the lipiodol group showed growth with volumes that were 2,130% larger and 712% larger respectively compared with baseline. The lipiodol and CA group showed a 10.2% decrease in volume compared with baseline. The lipiodol and CA group demonstrated a reduction in tumor perfusion between the preoperative and immediate post-operative timepoints (125%, $p < 0.05$).

Discussion: Embolization with lipiodol + CA provides a statistically significant improved tumor response compared to lipiodol or normal saline in a woodchuck WHV model. Combination treatment through embolization and lactate transport inhibition shows promise in reducing tumor volume and tumor viability.

Poster # 78

Pediatric Opioid Exposures in the United States (2012-2022)

Vithoukias, James

Background: The epidemiologic impact of opioid use in the United States has been widely studied. The effects of opioid exposures in pediatric populations have received considerably less attention. Few studies have focused on children under 10, a population which is prone to accidental exposure. The present study aims to explore patterns in the prevalence and health consequences of opioid exposures among children aged 0 to 9 in the U.S.

Methods: We conducted a retrospective review of the U.S. National Poison Data System (NPDS) between 2012 and 2022. Each poison center submits de-identified case data to NPDS after providing poison exposure management and information services to callers from the general public and health care providers. We assessed trends in exposures among children aged 0 to 5 years and among children aged 6 to 9 years. Type of substance exposure, medical outcome, and the level of care are reported. Poisson regression was used to identify trends over the study period.

Results: In 2022 there were 4,009 reported opioid exposures to NPDS in children aged 0 to 9 years, a decrease from 10,883 exposures in 2012. Statistically significant increases in rates of admission to critical care units were observed in both age groups over the study period. The rate of major effects also increased significantly in both age groups. Buprenorphine exposures increased among children aged 0 to 5, from 11.2% in 2012 to 26.7% in 2022. Among children aged 6 to 9, buprenorphine exposures increased from 3.7% in 2012 to 11.3% in 2022. Methadone exposures among both age groups did not change significantly in this study period. Prescription fentanyl-related exposures increased among children aged 0 to 5 from 0.4% in 2012 to 5.2% in 2022, and from 0.5% in 2012 to 3.7% in 2022 among children aged 6 to 9.

Discussion: Despite a decline in total exposures, the increase in critical care admissions and major effects observed in both age groups suggests that pediatric exposures are increasing in clinical severity. Increases in buprenorphine and prescription fentanyl exposures indicate a change in the profile of opioid exposures among pediatric patients. As clinical outcomes of pediatric opioid exposure become more severe, action is needed to limit pediatric opioid exposures.

Poster #79

How Kids Eat: A survey of child and family feeding practices in a rural pediatric population

Wells, James

Background: The purpose of our study was to assess nutritional practices for pediatric patients in Orange County Virginia so we could identify opportunities for education towards better eating habits. Current literature shows children are not following USDA dietary guidelines. The population at Orange is rural and consists of groups who are especially affected by poor diets.

Methods: Data was collected via a survey given to parents of children ages 1 to 12 during their visits to Orange County Pediatrics. Our survey included questions about economical barriers to food, mealtime practices, technology use, and the general composition of what children were eating. Data was collected for six weeks between June and July of 2023.

Results: Minority groups were more likely to consume sugary beverages. 36% of participants reported a TV being on when they eat and over 25% of children used tablets during meals. These participants were significantly more likely to eat fast food, eat fried foods, and drink sugary drinks. 43% of children drank a sugary drink daily and 20% were not drinking the recommended amount of dairy. 27% and 17% of children did not eat a daily vegetable or fruit respectively. 82% of participants reported eating fast food for convenience in the past month and over 75% ate fast food at least once a week. 12% of participants ran out of food before they got money to buy more in the past year.

Discussion: Children in our population were engaging in many unhealthy behaviors and faced many barriers to healthy eating. Further education about healthy eating practices is needed.

Poster #80

Ironing Out the Details: Does *Neisseria gonorrhoeae* Acquire Iron from Neutrophils?

Westlake, Cami

Background: *Neisseria gonorrhoeae* (Gc) causes 87 million new cases of the STI gonorrhea per year. Clinical sequelae of untreated infection include pelvic inflammatory disease, epididymitis, disseminated gonococcal infection, and life-threatening ectopic pregnancy. Increasing antibiotic resistance and no vaccine highlight the urgent need for research.

Gc utilizes metal transporters to hijack essential nutrients from human proteins. These proteins show promise as targets for vaccines and therapeutics due to their stability and importance. Neutrophils, the initial responders to Gc infection, fail to eliminate the pathogen. The aim of this study is to determine if and how Gc acquires iron from neutrophils.

Methods: Wild-type Gc was exposed to primary human neutrophils. RNA was collected from the infection mix and sequenced, or neutrophils were lysed and Western blotted for proteins of interest. Staining and imaging flow cytometry were used to assess transferrin presence in neutrophils. Isogenic mutant Gc strains lacking key metal transport genes were created and tested on human neutrophils to evaluate their survival and growth.

Results: Gc differentially expressed many iron-related genes when exposed to neutrophils, including the transferrin binding protein *tbpAB*. Neutrophils rescued growth of iron-starved Gc. Neutrophils were shown to have transferrin, but *TbpAB* was found to be dispensable for Gc survival during early interaction with neutrophils.

Discussion: These findings suggest that Gc acquires iron from neutrophils via a *TbpAB*-independent mechanism, possibly involving alternative iron transporters. Future research will determine the role of other Gc iron transporters in acquiring iron from neutrophils.

Poster #81

Improving Management of *Clostridioides difficile* Infection: A Study of Guideline Adherence and Outcomes

Whitt, Carley

Background: Appropriate management of *Clostridioides difficile* infection is complicated, and inappropriate treatment exacerbates and elongates illness. Patients are at greater risk of recurrent disease when providers fail to distinguish true *C. difficile* infection from colonization or post-infectious IBS. Substandard CDI care can occur by deviating from guidelines for repeat stool testing, over-treating with antibiotics, and delaying referral to the specialty clinic.

Methods: To evaluate guideline adherence and outcomes, we examined the electronic medical record of 63 consecutive patients referred to the UVA Complicated *C. Difficile* Clinic from March 2020 to July 2021. We evaluated diagnostic accuracy, treatment guideline adherence, and treatment outcomes in the community. We collected data from 220 disease episodes by reviewing test results, office visits, and outside hospital records to make a clinical judgment on the accurate diagnosis. Eighteen cases were excluded due to unknown outcomes or unknown treatment.

Results: The discordant diagnosis rate was 17.8 percent, with 72.2 percent of discordant diagnoses revised to *C. diff* colonization ($p = 0.0001$). Of those with true colonization, 68.3% responded to antibiotic treatment; 93.8% of true CDI responded ($p = 0.0001$). Of all episodes managed, 68.3 percent received a standard dosage of the 2017 Infectious Diseases Society of America (IDSA) recommended antibiotics; of those who received non-standard treatment, most (89 percent) received a non-standard dose of vancomycin, an IDSA-recommended antibiotic.

Discussion: In conclusion, there is a significant need for provider education to improve diagnostic accuracy and decrease inappropriate antibiotic use in CDI management.

Poster # 82

Development of an NMT Model to facilitate ICD to AIS translation (PyAIS)

Wu, Daniel

Background: The Abbreviated Injury Scale (AIS) provides a standardized medical terminology that ranks injury severity. Worldwide, the International Classification of Diseases (ICD) is more widely used to capture medical information. Both tools are essential for injury research; however, conversion between these two medical coding systems mirrors the challenges encountered in language translation. We hypothesize that neural machine translation (NMT), a deep learning technique used for human language translation, could be used to convert ICD codes to AIS. This study compares the accuracy of the NMT model for determining injury severity compared to two established methods of conversion and introduces a package to implement the NMT model for widespread use.

Methods: Data from a US national trauma registry, coded in both AIS and ICD, was used to train an NMT model. The prediction accuracy of the NMT model was compared to that of the official Association for the Advancement of Automotive Medicine (AAAM) ICD-AIS map and the R package 'ICD Program for Injury Categorization in R' (ICDPIC-R). Utilizing Python 3.7 as the foundation, a package was developed with the intention of distribution.

Results: The results show that the NMT model was the most accurate across all injury severity classifications, followed by the ICD-AIS map and then ICDPIC-R package. The NMT model also showed the highest correlation between the predicted and observed ISS scores.

Discussion: Overall, NMT appears to be a promising method for predicting injury severity from ICD codes, however, validation in external databases is needed.

Poster #83

A Novel Approach to Ablation of Lung Tissue using MRI-guided Focused Ultrasound

Yang, Jack

Background: MRI-guided Focused Ultrasound (MRgFUS) is a treatment modality that is minimally invasive and has been used for the ablation of solid tissue masses. Using ultrasound waves, acoustic energy can be concentrated to heat tissue to 60°C, causing rapid cellular death. However, one issue with MRgFUS for lung tissue ablation is the number of air-tissue interfaces, which attenuate ultrasound waves. This experiment tested the feasibility of a controlled lung collapse with hydrothorax to generate an acoustic window for MRgFUS lung ablations.

Methods: For this study, a total of eleven pigs were treated. Pigs were anesthetized and intubated with a double-lumen endotracheal tube. One lung was ventilated while the other was allowed to collapse, and saline was introduced into the respective hemithorax. For Pigs#10-#11, a mixture of Vitamin E, Evans Blue, and dye was injected to generate an artificial target visible on MRI and gross histology. Ablations were then conducted with MRgFUS, and pigs were re-scanned with MRI, euthanized, and examined with gross histology.

Results: Ablations at 350Watts for 20 seconds were appropriate for consistent lung ablation. In Pig#10-#11, the dye mixture generated a target visible on MRI. Ablations were conducted targeting this location and tissue destruction was confirmed with post-treatment MRI and gross histology.

Discussion: This experiment demonstrates a novel methodology for MRgFUS that uses controlled lung collapse and hydrothorax to target deep lung parenchyma. We generated artificial targets, and ablated specific lung regions, thus creating a treatment methodology that may be used to treat benign or malignant lung masses.

Poster #84

A National PearlDiver Database Analysis of State-Based Differences in Rates of Gender-Affirming Cosmetic and Surgical Procedures for Patients with Gender Dysphoria

Zulfiqar, Muhammad

Background: Hair removal is an essential aspect of gender-affirming care amongst transgender patients experiencing gender dysphoria, especially for fulfilling preoperative surgical requirements. However, most insurance policies lack coverage for hair removal procedures.

Methods: Using the PearlDiver database, patients with an ICD-10 gender dysphoria diagnosis between 2010 and 2021 were identified. Among these patients, those who underwent either permanent hair removal procedures or genital gender-affirming surgery were targeted with specific CPT codes. Procedure rates were recorded by state and analyzed by logistic regression.

Results: The PearlDiver database identified 86,360 patient records that fit the inclusion criteria. From this pool, 374 patients underwent genital reassignment surgery, and 191 patients had hair

removal procedures. There were no significant state-based differences in patient access to hair removal. In contrast, patients in Michigan ($p \leq 0.05$, OR = 7.41) and Ohio ($p \leq 0.05$, OR = 10.31) had increased odds of undergoing genital reassignment surgery.

Discussion: Patients with gender dysphoria have differential access to genital gender-affirming surgery across states, likely resulting from varying degrees of acceptance of surgical gender transition between states. In contrast, there were no significant differences in rates of permanent hair removal procedures that were covered by insurance. Given that patients with gender dysphoria underwent nearly twice as many genital gender-affirming surgeries as hair removal procedures, these results suggest that insurance coverage and acceptance of cosmetic gender-affirming procedures like hair removal are consistently inadequate across the United States.