



# VCU School of Medicine



## Poster Abstract Booklet

MEDICAL STUDENT RESEARCH DAY

MAY 5, 2026

# Poster Presentations

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# ROUND 1 ABSTRACTS

# Poster Presentation

Round 1 (11 AM - 12 PM)

1

## Ocular Dialysis Disequilibrium Syndrome: A Case Review Series

### Contributors:

Sarah Abouassali, M3, Virginia Commonwealth University

Zyannah Mallick, M1, Virginia Commonwealth University

Carolyn May MD, M3, Virginia Commonwealth University Department of Ophthalmology

Surbhi Bansal MD, Virginia Commonwealth University Department of Ophthalmology

### Abstract:

#### Background

Dialysis disequilibrium syndrome (DDS) is a recognized neurological complication of hemodialysis, attributed to osmotic shifts causing cerebral edema. Ocular dialysis disequilibrium syndrome (ODDS) characterized by acute, transient elevation of intraocular pressure (IOP) temporally related to hemodialysis sessions, is a poorly characterized and likely under-recognized phenomenon. No standardized diagnostic criteria or management guidelines currently exist, and the ophthalmology and nephrology communities rarely approach this condition collaboratively. We present a case series of four patients with recurrent post-dialysis IOP spikes to highlight the clinical features, diagnostic challenges, and management strategies of ODDS.

#### Description/Methods

We conducted a retrospective review of four patients with ESRD on hemodialysis who presented with recurrent acute IOP elevation temporally associated with hemodialysis sessions. Patient demographics, ocular and systemic history, IOP measurements, treatment regimens, and interdisciplinary management strategies were reviewed. One index case is presented in detail: a 64-year-old male with ESRD on thrice-weekly hemodialysis, low-tension glaucoma, status post phacoemulsification/Xen implant OS, who presented to the emergency department with IOP of 38 mmHg OS rising to a maximum of 48 mmHg following dialysis, requiring acute topical IOP-lowering therapy. Interdisciplinary discussion between ophthalmology and nephrology led to initiation of acetazolamide 250 mg orally three times weekly on non-dialysis days, with consideration of adjusting dialysis sodium bath and blood flow rate.

#### Results

Across the four cases, recurrent post-dialysis IOP elevation was the defining feature, with IOP spikes ranging from 30 to 48 mmHg. Management required individualized, interdisciplinary strategies combining topical glaucoma therapy and systemic carbonic anhydrase inhibition.

#### Conclusions/Lessons Learned/Potential Impact

ODDS represents a distinct and underrecognized clinical entity requiring heightened awareness among both ophthalmologists and nephrologists. Early interdisciplinary collaboration, individualized IOP management, and consideration of dialysis parameter modification are key to reducing the risk of progressive glaucomatous damage in this vulnerable patient population. Establishing diagnostic criteria and treatment protocols for ODDS is warranted.

# Poster Presentation

Round 1 (11 AM - 12 PM)

2

## **Biomarker Evidence of Toxicant Exposure in Exclusive Cigar Smokers: Insights from the Population Assessment of Tobacco and Health Study Wave 7 (2022–2023)**

### **Contributors:**

Amanda Adolfo, M3, Virginia Commonwealth University  
Mary Rezk-Hanna, PhD, UCLA School of Nursing  
Mary-Lynn Brecht, PhD, UCLA School of Nursing  
Umme S. Warda, MS, UCLA School of Nursing

### **Abstract:**

**Introduction:** Cigar smoking is often perceived as less harmful than cigarette smoking due to assumptions of infrequent use and lower inhalation. However, population-level biomarker evidence for exclusive cigar users, especially by recency of use remains sparse. Herein, we examined heavy metal and nicotine biomarker concentrations among exclusive cigar smokers versus cigarettes smokers and never tobacco users using data from Wave 7 (2022–2023) of the Population Assessment of Tobacco and Health (PATH) Study.

**Methods:** We compared geometric mean concentrations of urinary cadmium, lead, and uranium (heavy metals) and cotinine (nicotine metabolite) among exclusive cigar smokers ( $n = 79$ ), exclusive cigarette smokers ( $n = 1192$ ), and never tobacco users ( $n = 691$ ). Smokers were stratified by recency of use (Today versus Yesterday/Day Before). Survey-weighted multiple linear regression tested group differences in unadjusted and covariate-adjusted models.

**Results:** As compared to cigarette smokers, cigar smokers were predominately male and older (aged  $\geq 55$  years), with greater representation of non-Hispanic Black individuals and higher cardiovascular disease prevalence (all  $p < 0.05$ ). Flavored cigar use was reported by 94% of cigar smokers and cigarillos were most reported, with 41.8% smoking at least one in the past 3 days. Compared with never tobacco users, “Today” cigar smokers had significantly higher urinary cadmium (0.30 vs. 0.16  $\mu\text{g/L}$ ,  $p = 0.001$ ), uranium (0.010 vs. 0.005  $\mu\text{g/L}$ ,  $p = 0.002$ ), and cotinine (931.5 vs. 0.14  $\text{ng/mL}$ ,  $p < 0.0001$ ). Cadmium and lead levels among cigar smokers were comparable to cigarette smokers ( $p = \text{ns}$ ), whereas uranium was higher among cigar smokers ( $p < 0.05$ ). “Yesterday/Day Before” cigar smokers showed elevated lead (0.30  $\mu\text{g/L}$ ) and cotinine (199.4  $\text{ng/mL}$ ) relative to never users. In adjusted models, both recent-use groups remained significantly higher than never users across all metals and cotinine levels.

**Discussion:** Recent exclusive cigar use results in substantial systemic exposure to toxic metals and nicotine. These findings challenge the perception of cigars as a safer tobacco alternative and support regulatory actions to reduce flavored cigar appeal, enhance product warnings, and include cigars in cessation strategies.

# Poster Presentation

Round 1 (11 AM - 12 PM)

3

## CPT-derived Indicators Reveal Access Barriers to Ophthalmic Care in High-need Virginia Communities

### Contributors:

Omar Al-Dulaimi, M3, VCU

Tiba Alshammari, MS, VCU

Vikram Brar, MD, VCU Ophthalmology

### Abstract:

**Purpose:** To further characterize the relationship between vision difficulty and access to ophthalmic care across Virginia counties using per-capita billing of ophthalmology Current Procedural Terminology (CPT) codes as a proxy for healthcare utilization and access, with special focus on rural and non-rural distinctions.

**Methods:** County-level data on vision difficulty and population were obtained from the U.S. Census Bureau's American Community Survey (ACS) 2021 5-year estimates and the Decennial Census. Vision difficulty was defined as "blind or having serious difficulty seeing, even when wearing glasses." Counties were classified as above or below the state median prevalence (2.9%). Ophthalmic billing data from Medicare and Medicaid were used to calculate per-capita CPT code rates (per 10,000 residents) for eight procedures (92002, 92004, 92012, 92014, 92083, 92133, 92134, 67028). Analyses included nonparametric Spearman correlations, hurdle modeling (logit + negative binomial components), and standalone negative binomial regressions to distinguish between access (zero part) and utilization intensity (count part). Rural versus urban stratification and geographic mapping were performed to visualize disparities.

**Results:** Significant negative correlations were found for CPT 92002 ( $\rho = -0.25$ ,  $p = 0.0065$ ), 67028 ( $\rho = -0.24$ ,  $p = 0.0088$ ), and 92004 ( $r = -0.19$ ,  $p = 0.0358$ ), indicating that counties with higher vision difficulty had lower ophthalmic billing rates. Hurdle models confirmed access barriers ( $OR < 1$ ) for 92002 ( $OR = 0.620$ ,  $p = 0.0141$ ) and 67028 ( $OR = 0.622$ ,  $p = 0.0242$ ), while 92004 demonstrated both reduced access ( $OR = 0.755$ ,  $p = 0.0156$ ) and underutilization among those with access ( $IRR = 0.667$ ,  $p = 0.0025$ ). Negative binomial models showed consistent trends, with lower utilization intensities among rural counties.

**Conclusions:** Higher vision difficulty prevalence was associated with lower ophthalmic care access and utilization across multiple CPT codes, suggesting that current service distribution does not align with community need, especially in rural Virginia counties. CPT-based metrics provide a scalable, data-driven approach for quantifying ophthalmic access disparities and can inform public health strategies targeting underserved Virginia counties like establishing teleophthalmology.

# Poster Presentation

Round 1 (11 AM - 12 PM)

4

## Determining the Impact of Antibiotic Therapy on the Resolution of Symptoms in Pediatric Acute Neuropsychiatric Syndrome (PANS)

### Contributors:

Sruthi Alampally, M2, Virginia Commonwealth University  
Dr. Judith Voynow, MD, VCU Department of Pulmonology  
Dr. David Jaffe, MD, VCU Department of Neurology

### Abstract:

Pediatric Acute-Onset Neuropsychiatric Syndrome (PANS) is defined by the abrupt onset of cognitive and behavioral regression in children, most commonly between ages 3 and 12 (1). It is frequently associated with recent infections, including Group A Streptococcus (1). Diagnosis requires the sudden development of obsessive-compulsive disorder or severe food restriction, accompanied by at least two additional symptoms: anxiety, emotional lability, irritability, aggression, developmental regression, decline in academic performance, sensory or motor abnormalities, sleep disturbances, or urinary symptoms. Although the exact etiology remains unclear, an autoimmune mechanism is suspected (1). Diagnosis is challenging due to the absence of definitive laboratory testing and significant overlap with primary psychiatric conditions. Children with PANS may exhibit severe agitation and alarming compulsive behaviors, causing profound distress for families, underscoring the urgency of effective treatment (1). Current therapeutic approaches include antibiotics, corticosteroids, intravenous immunoglobulin (IVIG), and plasmapheresis, yet no standardized treatment guidelines exist. While antibiotics have shown promise, prospective controlled trials remain limited due to clinical heterogeneity among patients (2).

To address gaps in understanding treatment efficacy, we conducted a retrospective chart review evaluating antibiotic therapy in 30 patients diagnosed with PANS under the care of Dr. David Jaffe, MD, VCU Child Neurology from the years 2016-2023. Our central hypothesis was that earlier initiation and longer duration of antibiotic therapy would improve remission rates and prolong symptom-free intervals. Using de-identified EPIC data, we collected information on symptom presentation, age at onset, age at treatment initiation, and diagnostic criteria fulfillment.

Patients were categorized into three groups: resolution with antibiotics, no resolution, and lost to follow-up. Results showed PANS predominantly affects early school-age children and 70% of the children improved on antibiotic therapy. We will determine factors that are associated with clinical response to antibiotics. Limitations include single-physician sampling, retrospective design, incomplete data, and variability in documentation.

Psychiatr Clin North Am . 2023 Mar;46(1):69-88. doi: 10.1016/j.psc.2022.11.004. Neuroinflammation in Obsessive-Compulsive Disorder: Sydenham Chorea, Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections, and Pediatric Acute Onset Neuropsychiatric Syndrome. Allison Vreeland 1, Margo Thienemann 2, Madeleine Cunningham 3, Eyal Muscal 4, Christopher Pittenger 5, Jennifer Frankovich 6. PMID: 36740356 DOI: 10.1016/j.psc.2022.11.004

Burchi, E., & Pallanti, S. (2024, January 26). Antibiotics for pandas? limited evidence: Review and putative mechanisms of action. Psychiatrist.com. <https://www.psychiatrist.com/pcc/antibiotics-for-pandas/>

# Poster Presentation

Round 1 (11 AM - 12 PM)

5

## Exploring the Impact of Palliative Care and Hospice Involvement on Hospital Mortality Metrics

### Contributors:

Dalia Allaw, M3, Virginia Commonwealth University  
Brian Cassel, PhD, VCU Department of Internal Medicine

### Abstract:

**Background:** Hospital mortality rates are widely used in public reporting systems, hospital rankings, and reimbursement programs as indicators of hospital quality. These measures assume mortality reflects care performance. However, patients receiving palliative care (PC) or hospice services may have fundamentally different goals of care. A 2010 analysis by Cassel et al. demonstrated variability in how mortality-reporting entities accounted for hospice and PC involvement. Given substantial changes in coding systems and mortality modeling over the past decade, an updated evaluation is warranted.

**Methods:** We conducted a structured review of current mortality methodologies from CMS (Hospital Compare/Star Ratings), U.S. News & World Report, Healthgrades, Vizient, and Premier. Publicly available technical documentation was analyzed for inclusion/exclusion criteria, risk-adjustment strategies, and handling of hospice enrollment and ICD-10 codes associated with palliative care (Z51.5) and do-not-resuscitate status (Z66). Recent methodological updates, including incorporation of Medicare Advantage data and revised comorbidity adjustment models, were examined.

**Results:** All entities use risk-adjusted mortality measures but differ substantially in how hospice and PC involvement are handled. CMS excludes patients with prior hospice enrollment but does not incorporate palliative care coding into risk adjustment. Healthgrades excludes certain hospice discharges and incorporates PC coding in selected cohorts. Vizient and Premier primarily use observed-to-expected mortality ratios, with Premier relying heavily on ICD-10 coding to identify palliative care and selectively excluding prior hospice cases. Across systems, identification of PC is largely dependent on administrative coding, which may be inconsistently applied.

**Conclusions:** Significant variability persists in how mortality metrics account for end-of-life care. Inconsistent recognition of hospice and palliative care involvement may introduce bias in hospital comparisons. Improved transparency and incorporation of end-of-life variables may enhance fairness in hospital quality measurement.

# Poster Presentation

Round 1 (11 AM - 12 PM)

6

## Hidden in the White Count: Light-Chain MGUS Unmasked by Unexplained Leukocytosis

### Contributors:

Aesha Amin, M4, Virginia Commonwealth University School of Medicine

Eva Jin, MD, Internal Medicine Resident, Virginia Commonwealth University

Bharadhwaj Kolipakkam, MBBS, Department of Internal Medicine, Virginia Commonwealth University

### Abstract:

A 23-year-old male was referred to the Hematology-Oncology clinic for persistent leukocytosis, with WBC ranging from 22.6 to 40.7  $10^9/L$ . Leukocytosis was initially detected during an episode of pneumonia. Labs at that time revealed a negative infectious and inflammatory workup. Peripheral blood smear demonstrated neutrophilia with mild monocytosis. The initial bone marrow biopsy revealed normocellular marrow with myeloid hyperplasia. Additionally, BCR/ABL1 mRNA qualitative analysis for atypical transcripts was negative, and next-generation sequencing identified no clinically significant mutations. Given persistent neutrophilia, imaging was done to exclude a paraneoplastic etiology, which did not show any evidence of malignancy. Repeat bone marrow biopsy was performed to exclude a myeloproliferative disorder, which demonstrated hypercellularity (100%) with 5% lambda-restricted plasma cells consistent with monoclonal plasmacytosis. Additional testing showed elevated serum free lambda light chains (309 mg/L), normal free kappa light chains (16 mg/L), and a decreased kappa/lambda ratio of 0.05. SPEP, IFE, and GM-CSF levels were within normal limits. Based on these findings and the lack of Myeloma-defining events, the patient was diagnosed with Light-Chain MGUS. The patient is currently under surveillance with a Myeloma specialist. MGUS is a premalignant plasma cell disorder, most commonly presenting as IgG or IgM subtypes. Light-chain MGUS is a rare variant characterized by the absence of an immunoglobulin heavy chain. This may progress to Light-Chain Smoldering Myeloma, Light-Chain Multiple Myeloma, AL amyloidosis, or light-chain deposition disease. Neutrophilic leukemoid reaction associated with plasma cell disorders, including MM and MGUS, is an uncommon but recognized phenomenon. Mechanisms include production of cytokines such as IL-6 and G-CSF by clonal plasma cells that stimulate granulopoiesis. This case highlights a rare presentation of persistent neutrophilia associated with Light-Chain MGUS, emphasizing the need to consider Plasma Cell Disorders in the differential diagnosis of unexplained neutrophilia.

# Poster Presentation

Round 1 (11 AM - 12 PM)

7

## Evaluating Discordance Between MRI and PSMA-PET/CT in Initial Prostate Cancer Imaging

### Contributors:

Aashish Batheja, M4, Virginia Commonwealth University

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### Abstract:

**Background:** Magnetic resonance imaging (MRI) and prostate-specific membrane antigen positron emission tomography/computed tomography (PSMA-PET/CT) are two most important imaging modalities used in conjunction for many patients being evaluated for prostate cancer (PCa). In some cases, there may exist differences in imaging findings between these two modalities. The purpose of this study is to assess the rate and types of discordant findings between MRI and PSMA-PET/CT in the context of prostate cancer imaging.

**Methods:** Consecutive men diagnosed with PCa who underwent both prostate MRI and PSMA-PET/CT in 2023 – 5/2025 were retrospectively included in the study. Concordance between the two imaging modalities was defined with the presence of the same index lesion and any other noted lesions. Discordance was classified as “minor” (additional/larger lesions noted on single modality) or “major” (different index lesions or index lesions only noted on one modality). Furthermore, the accuracy of imaging modalities in identifying PCa were correlated with the pathological results from the guided imaging targeted and systematic prostate biopsies.

**Results:** Of the 129 patients included, 87/129 patients (67.4%) had concordant imaging results between the two modalities. By contrast, 33/129 patients (25.6%) had minor discordant results and 9/129 (7%) had major discordant results. There were 24/129 patients (18.6%) with false positive lesions noted on PSMA-PET/CT (as validated by the pathological results from prostate biopsy). There were 12/129 patients (9.3%) who had negative prostate MRI, but with positive PSMA PET/CT in which prostate biopsy confirmed clinically significant PCa.

**Conclusion:** While MRI and PSMA-PET/CT were concordant in many patients (67.4%), over 30% of patients had discordant findings between these two modalities in detection of primary PCa, with false positive or negative present in both modalities. Therefore, the use of combined PSMA PET/CT and MRI in PCa triage may be feasible since it may increase sensitivity and specificity in detection of PCa.

# Poster Presentation

Round 1 (11 AM - 12 PM)

8

## Comparing the Risk of Contralateral Eye Injury in Amblyopic Patients to the General Population

### Contributors:

Manasa Chillarige, M2, Virginia Commonwealth University  
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### Abstract:

**Introduction:** Small prior studies have suggested that patients with amblyopia may have an increased risk of traumatic vision loss in their contralateral eye. However, these studies were limited by small sample sizes. A large-population analysis is needed to better quantify this risk and determine whether it persists across age groups, given the lifelong monocular visual impairment associated with amblyopia. This study aimed to quantitatively assess the risk of contralateral ocular trauma in patients with unilateral amblyopia by comparing the incidence of injury to that in a non-amblyopic control cohort.

**Methods:** Using the TriNetX federated health research network, patients with unilateral right or left amblyopia were identified and matched to non-amblyopic controls using propensity score matching across three age groups (1–18, 19–41, and 41–65 years). Risk ratios and odds ratios were calculated to compare the incidence of contralateral eye injury between cohorts.

**Results:** In all age groups, patients with unilateral amblyopia demonstrated a higher incidence of contralateral ocular injury compared to matched controls. In the pediatric group, 249/44,650 (0.6%) of right amblyopia patients sustained a contralateral eye injury compared to 119/45,070 (0.3%) in controls (RR: 2.11, OR: 2.12). Among pediatric left amblyopia patients, 253/59,987 (0.4%) experienced a contralateral injury compared with 181/60,172 (0.3%) controls (RR: 1.40, OR: 1.40). For the 19–40-year-old group: right amblyopia (n=8,289, RR: 2.16, OR: 2.17), left amblyopia (n=9,678, RR: 3.13, OR: 3.14). For the 41–65 age group: right amblyopia (n=13,187, RR: 3.12, OR: 3.14), left amblyopia (n=13,327, RR: 3.26, OR: 3.29).

**Conclusion:** This large population-based cohort study confirms that individuals with amblyopia are at an increased risk of contralateral eye injury compared to the general population. These findings reinforce the importance of monocular precautions to reduce the risk of bilateral vision loss.

# Poster Presentation

Round 1 (11 AM - 12 PM)

9

## Characterization of the Potent and Selective Peroxisome Proliferator-Activated Receptor- $\alpha$ (PPAR- $\alpha$ ) Agonist Pemaibrate in a Mouse Model of Chemotherapy-Induced Peripheral Neuropathy (CIPN)

### Contributors:

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### Abstract:

The lifetime probability of developing an invasive cancer like breast, ovarian, or lung is roughly 40% in both men and women (Siegel et al., 2020). Of these patients that are treated with paclitaxel, a cancer chemotherapeutic, up to 70% are likely to develop some degree of chemotherapy-induced peripheral neuropathy (CIPN) with symptoms of numbness, lost sense of proprioception, tingling, and mechanical and thermal allodynia (Boyette-Davis et al., 2018; Park et al., 2013). However, recent CIPN

rodent model studies have shown that activation of the nuclear receptor Peroxisome Proliferator- Activated Receptor- $\alpha$  (PPAR $\alpha$ ) using choline fenofibrate produced partial reversal and prevention of paclitaxel-induced mechanical and cold hypersensitivity. Unfortunately, not only was CIPN not fully reversed or prevented, but fibrates are also associated with a number of adverse side effects, like damage to the kidneys, liver, and the development of myopathy when co-administered with statins (Jacobson et

al., 2009; Škop et al., 2016; Post et al., 2001). With these limitations, we investigated if pemaibrate, a more specific and more potent PPAR $\alpha$  agonists, could be more efficacious in reversing and preventing CIPN than previously seen choline fenofibrate. To answer this question, we first observed that acute administration of pemaibrate dose- and time-dependently reversed paclitaxel-induced mechanical and cold hypersensitivity. Our second aim investigated if the effects of acute pemaibrate administration could be maintained after repeated treatment or would tolerance to the drug develop. Lastly, after we observed that repeated oral administration of pemaibrate reverses paclitaxel-induced mechanical and cold hypersensitivity and reduction of NAP amplitude

without the development of tolerance. In our third aim, we then saw the prevention of these same measurements after both the pretreatment of pemaibrate and coadministration of pemaibrate and paclitaxel. Ultimately, the findings within this study show the therapeutic potential of pemaibrate in the reversal and prevention of the effects of paclitaxel-induced peripheral neuropathy.

# Poster Presentation

Round 1 (11 AM - 12 PM)

10

## Uncovering the Function of Heat Shock Protein 27 in Glioma-Associated Reactive Astrocytes

### Contributors:

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### Abstract:

Glioblastoma multiforme (GBM) is the most common and lethal primary brain malignancy characterized by the presence of a unique immunosuppressive microenvironment limiting treatment success. GBM tumors contain an array of non-neoplastic cells, including reactive astrocytes (RAs) that support tumor growth and progression. TCGA data analysis indicates that patients with GBM tumors expressing high levels of heat shock protein 27 (Hsp27) have poorer survival. We used both spontaneous and syngeneic mouse models of glioma along with in vitro primary astrocyte cultures. Protein extracted from crushed non-tumor, tumor/tumor microenvironment, and surrounding tissue samples from spontaneous and syngeneic tumors were utilized to show gross expression of Hsp27 in these areas. Immunofluorescence staining of both tumor models detailed which cells in the tumor microenvironment express Hsp27. Astrocytes isolated from wildtype P3 mouse pups were exposed to various media to narrow down a possible mechanism for inducing Hsp27 expression. We surprisingly found that Hsp27 is exclusively expressed by glioma-associated RAs nearby the tumor, but not by myeloid or glioma cells. Importantly, Hsp27 is not expressed in astrocytes residing in the non-tumor hemisphere of the brain, indicating that Hsp27 expression is specific to astrocytes which surround the tumor. Furthermore, conditioned media from glioma cells induce HspB1 mRNA (encoding Hsp27) and Hsp27 protein expression in primary mouse astrocyte cultures in vitro. This induction of Hsp27 expression is not prevented by boiling of glioma conditioned media or removing the components with molecular weights >3 kDa, but is abolished with the removal of lipids, suggesting that a small lipid secreted by glioma induces expression of Hsp27 in astrocytes. Though the mechanism by which Hsp27 contributes to poor patient outcomes is still being uncovered, our results provide compelling evidence that Hsp27 is a key player in glioma progression, and understanding its role may open novel avenues to future GBM therapeutics.

# Poster Presentation

Round 1 (11 AM - 12 PM)

11

## The Protective and Therapeutic Potential of Nature in Relation to Adverse Childhood Experiences

### Contributors:

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Robert Argabright III, Founder of Bellemeade Park

Carolyn Schuyler, LCSW, Founder of Wildrock and Co-founder of Nature Connection Lab

Gaby Villalobos, MSW, VCU Department of Family Medicine and Population Health

### Abstract:

**Context:** While nature therapy has been integrated into some international health care systems, its evidence-base in the United States for the prevention and treatment of pediatric social, emotional, and behavioral problems—such as those commonly occurring in children with adverse childhood experiences (ACEs)—is less well understood.

**Objectives:** We sought to (1) conduct systematic reviews to identify nature-based therapy as a psychosocial intervention for the prevention and treatment of ACEs, and (2) interviews to understand the evidence in the context of the lived experiences of park directors in Virginia, who provide underserved children a space for nature play and discovery care.

**Study Design:** Mixed-methods **Setting or Dataset:** PubMed, the American Academy of Pediatrics, MDPI, and Sage Journals were used to identify systematic reviews. **Population:** Qualitative interviews were conducted with the founder of Bellemeade Park in Richmond, VA, and the director of Wildrock, a nature-play and discovery center in Charlottesville, VA.

**Results:** Several nature-based therapy interventions such as play therapy and nature-immersion have been shown to have emotional, and behavioral benefits for children with ACEs. The prevalence of ACEs is also disproportionately higher in Black and Hispanic populations than in White populations, and neighborhoods where residents predominantly identify as people of color have access to an average of 44 percent less park acreage than predominantly white neighborhoods, which deems them “high priority.” Relatedly, children living in high priority areas are reportedly more likely to have lower Childhood Opportunity Index scores. Interviews reinforced the understood impact of nature discovery and therapy programs for children in high priority communities, and feedback from local teachers cited improvements in school attendance and in regulating problems like anxiety or ADHD.

**Conclusion:** Nature-based therapy interventions have been shown to support better health and academic outcomes in children with ACEs. Therefore, future research is needed to better understand and address racialized barriers to green spaces, to make nature-therapy more accessible for all individuals.

# Poster Presentation

Round 1 (11 AM - 12 PM)

12

## A Rare Presentation of Cutaneous Metastasis in Squamous Cell Carcinoma of the Head and Neck Region: Case Report and Literature Review

### Contributors:

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### Abstract:

#### Purpose / Objective / Background

Cutaneous metastases from head and neck squamous cell carcinoma (HNSCC) are rare and typically indicate advanced disease with poor prognosis. Human papillomavirus (HPV)-associated oropharyngeal squamous cell carcinoma (OPSCC) generally demonstrates favorable response to chemoradiation and improved survival; however, atypical metastatic patterns are infrequently reported. We describe a rare case of HPV-associated OPSCC with sequential multimodal treatment followed by dermal metastasis to the malar cheek. This case highlights diagnostic challenges, the role of circulating tumor DNA (ctDNA) surveillance, and implications of unusual metastatic spread in HPV-related disease.

#### Methods / Materials / Description

We present a longitudinal case review of a 52-year-old male diagnosed with p16-positive, HPV-associated OPSCC (cT3N2cM0) treated with definitive chemoradiation (70 Gy with concurrent cisplatin). Surveillance included serial PET/CT imaging and ctDNA monitoring using the NavDx platform. Following initial complete response, the patient developed sequential recurrence involving the sinonasal cavity, regional lymph nodes, and ultimately a cutaneous lesion of the left malar cheek confirmed by biopsy as metastatic p16-positive squamous cell carcinoma. Management included salvage surgery, re-irradiation, systemic chemotherapy, and pembrolizumab immunotherapy.

#### Results / Evaluation

The patient demonstrated an initial complete response following definitive chemoradiation. ctDNA positivity preceded radiographic evidence of recurrence, leading to early detection of sinonasal disease confirmed as recurrent HPV-associated SCC. Despite multimodal salvage therapy, the patient developed regional nodal relapse and subsequent dermal metastasis to the malar cheek. Histopathology confirmed metastatic p16-positive SCC with lymphovascular invasion. Initiation of pembrolizumab resulted in clinical improvement, radiographic response, and reduction of ctDNA from detectable levels to undetectable, with continued disease control on therapy.

#### Conclusions / Lessons Learned / Potential Impact

This case illustrates an uncommon metastatic trajectory of HPV-associated OPSCC, progressing from locoregional recurrence to distant cutaneous dissemination. It underscores the potential for aggressive biology despite HPV-associated status and highlights the clinical value of ctDNA monitoring for early detection of recurrence. Recognition of atypical metastatic patterns, including dermal spread, is critical for timely diagnosis and management. This report contributes to the limited literature describing cutaneous metastases in HPV-related HNSCC and supports the role of liquid biopsy in long-term surveillance.

# Poster Presentation

Round 1 (11 AM - 12 PM)

13

## Physical Activity Regardless of Muscle Quality is Associated with Preserved Six Minute Walk Distance 24 Months after Breast Cancer Treatment

### Contributors:

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### Abstract:

**Introduction:** In breast cancer (BC) patients, sufficient physical activity (PA) and low intermuscular fat (IMF) before initiating chemotherapy are linked to preserved six-minute walk distance (6MWD) three months into treatment, but impacts on 6MWD two years after treatment remain unknown.

**Methods:** In this secondary analysis of R01CA199167, 144 female BC survivors receiving anthracycline or cyclophosphamide chemotherapy underwent 6MWD and IMF testing at baseline, 3-, and 24-months after initiating treatment. Paraspinal IMF:skeletal muscle (SM) ratios were quantified in a blinded fashion. Similar IMF and 6MWD tests were assessed twice over 2 years in 97 female comparators without BC. BC survivors were sorted into groups by baseline PA and IMF:SM (Figure). ANOVA and Fisher's Exact tests compared group characteristics, linear regression modeled 6MWD over time, and Welch's T-test compared adjusted group 6MWDs.

**Results:** Average age differed between groups ( $p < 0.001$ ), but race, HCT, and smoking status did not. Inactive BC survivors with low IMF:SM showed a mean 24-month 6MWD of 454.41 meters, which was significantly lower than non-cancer comparators (497.79 meters,  $p < 0.05$ ). Additionally, inactive BC survivors with high IMF:SM showed a lower 6MWD than comparators (441.75 meters, 497.79 meters, respectfully  $p < 0.05$ ). However, BC survivors who were active at baseline, both with low IMF:SM and high IMF:SM, showed similar 24-month 6MWD relative to comparators (522.22 meters, 493.59 meters, 497.79 meters, respectfully,  $p > 0.05$  for all comparisons).

**Conclusions:** Regardless of baseline muscle quality, sufficient physical activity prior to initiating BC treatment is associated with preserved 6MWD two years after initiation of potentially cardiotoxic chemotherapy, comparable to women without cancer. This suggests that sufficient physical activity in BC patients may mitigate the impact of poor muscle quality on long-term submaximal exercise capacity.

# Poster Presentation

Round 1 (11 AM - 12 PM)

14

## Mechanical Regulation of Fibroblast Behavior in Pulmonary Fibrosis

### Contributors:

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### Abstract:

Lung fibrosis is a progressive, irreversible condition with limited therapies, having significant adverse effects and little efficacy. While the development of therapeutics begins with in vitro studies, the typical cell culture systems involve seeding cells on stiff, static plastic or glass. This does not capture the dynamic environment observed within the lung, the cellular responses to mechanical cues, the physiologically soft substrate of normal lung tissue, and the cyclic stretch associated with breathing. Using the Flexcell FX-6000 Tension System, and its accompanying cell culture plates with tunable stiffnesses, we sought to characterize the behavior of primary human lung fibroblasts (HLFs) in response to cyclic stretch on physiologically healthy (1kPa) and fibrotic (60kPa) stiffnesses in the presence and absence of TGF- $\beta$ . We treated HLFs, from both a non-fibrotic (NF) and fibrotic (IPF) donor, with TGF- $\beta$  on either 1 kPa or 60 kPa plates and subjected the cells to dynamic cyclic stretch mimicking physiological breathing (2-10%, 0.25 Hz) for 72 hours. We harvested cells to investigate myofibroblast differentiation markers, proteins indicative of extracellular matrix (ECM) production and deposition, and mechanoreceptors (Piezo 1 and Piezo 2). Treatment with stretch blunted myofibroblast differentiation markers  $\alpha$ SMA and Calponin 1 in the presence of TGF- $\beta$  in the NF donor, but had minimal effect on ECM through proteins fibronectin and collagen 1A1 for both donors. Stretch decreased Piezo 1 expression but not Piezo 2 expression in the presence of TGF- $\beta$  in both IPF and NF HLFs. Our findings suggest that the mechanical cues sensed by cells during stretch may be involved in fibroblast-to-myofibroblast transition while the environmental stiffness can affect cell proliferation and apoptosis, which are significant considerations for in vitro pulmonary fibrosis studies.

# Poster Presentation

Round 1 (11 AM - 12 PM)

15

## Planned Oocyte Cryopreservation Outcomes in Physicians Compared to Non-physicians

### Contributors:

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### Abstract:

**Objective:** To study the outcomes of female physicians who underwent planned oocyte cryopreservation compared to non-physician counterparts.

**Design:** Retrospective cohort study

**Patient(s):** All patients who underwent planned oocyte cryopreservation between August 2016 to February 2025 at a single academic reproductive endocrinology and infertility practice.

**Exposure (for observational studies):** Occupation (physician vs other)

**Main Outcome Measures:** The primary outcome was the total and mature number of oocytes retrieved.

**Results:** A total of 208 patients underwent planned oocyte cryopreservation including 70 physicians and 138 non-physicians. The mean age of physicians at the time of OC was 32.76 (range 28–42) compared to 34.99 (range 25–41) in the non-physician group ( $p$ -value  $< 0.01$ ). Physicians had a mean of 19.57 total oocytes retrieved (14.64 mature) compared to 20.57 in non-physicians (14.87 mature), which was not statistically significantly different ( $p$ -values = 0.85 and 0.98 respectively). Mean AMH in physicians was lower compared to non-physicians but this was not statistically significant (2.98 vs. 3.37;  $p$ -value = 0.74).

On multiple regression analysis controlling for age, peak estradiol, and total FSH dose, physician occupation was not significantly associated with total oocyte yield ( $\beta = -2.214$ ,  $p = 0.12$ ) or mature (M2) oocytes ( $\beta = -1.623$ ,  $p = 0.18$ ). Peak estradiol was positively associated with total ( $\beta = 0.005$ ,  $p < 0.01$ ) and mature oocytes ( $\beta = 0.004$ ,  $p < 0.01$ ). Increasing age was negatively associated with total ( $\beta = -0.421$ ,  $p = 0.02$ ) and mature oocytes ( $\beta = -0.389$ ,  $p < 0.01$ ). Total FSH dose demonstrated a small but statistically significant negative association with total ( $\beta = -0.002$ ,  $p < 0.01$ ) and mature oocyte numbers ( $\beta = -0.001$ ,  $p < 0.01$ ).

**Conclusion:** There were no statistically significant differences in the total or mature number of oocytes retrieved during physicians' first planned oocyte cryopreservation cycle compared to non-physicians. Female physicians had a non-significantly lower AMH than non-physicians.

**Keywords:** Planned oocyte cryopreservation, egg freezing, female physicians, fertility preservation, assisted reproductive technology

# Poster Presentation

Round 1 (11 AM - 12 PM)

16

## Biological Markers Predict the Onset and Reawakening of Cancer Dormancy in the Liver

### Contributors:

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### Abstract:

The occurrence of liver metastases following periods of dormancy remains a significant clinical challenge. Previous studies have identified several molecular pathways involved in cancer dormancy, including Wnt/ $\beta$ -catenin, Notch, and TGF- $\beta$  signaling. These findings highlight the important roles of the tumor microenvironment and epigenetic modifications in maintaining a dormant state. However, the specific genes involved and their interactions with the tumor microenvironment are not yet fully understood. This study investigates molecular mechanisms regulating cancer dormancy in the liver by integrating single-cell transcriptomic analysis with molecular validation approaches. Tissue samples from various cancer types with liver recurrence were obtained. Flow cytometry was used to isolate dormant cancer cells, hepatocytes surrounding dormant cells, active cancer cells, and hepatocytes surrounding cancer cells. Flower protein isoform analysis was performed to assess cell competition between cancer cells and hepatocytes. Single-cell RNA sequencing was then used to identify differentially expressed genes in cancer cells and neighboring hepatocytes. Findings suggest that hepatocytes surrounding dormant cells express the Flower-Win isoform whereas the dormant cells have low Flower expression, causing dormant cells to be under check. In contrast, hepatocytes surrounding cancer cells have the Flower-Lose isoform whereas the cancer cells have the Flower-Win isoform, causing cancer cells to evade control. Analysis of single-cell sequencing data reveals differential gene expression of cancer cells, dormant cells, and surrounding hepatocytes which is regulating the dormancy state. The next steps in evaluation include validation of the identified targets using biochemical techniques including Western blotting, quantitative PCR, and immunohistochemistry to confirm their expression and functional relevance in the context of liver cancer dormancy. These findings may inform future therapeutic strategies designed to maintain dormancy and ultimately reduce the risk of metastatic relapse.

# Poster Presentation

Round 1 (11 AM - 12 PM)

17

## Simulation-Based Education for Stevens Johnson Syndrome Recognition and Management

### Contributors:

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### Abstract:

#### Background

Stevens Johnson Syndrome (SJS) is a rare, life-threatening mucocutaneous emergency with an incidence of approximately 1-6 cases per million person-years.<sup>1</sup> Medical students rarely encounter this condition during training, creating significant preparedness gaps.<sup>2</sup> Simulation-based medical education (SBME) has demonstrated effectiveness for teaching rare, high-acuity conditions,<sup>3</sup> yet published interventions specifically targeting SJS remain limited. This innovation addresses this gap through a structured simulation-based curriculum.

#### Methods

We implemented a 90-minute simulation for fourth-year medical students on clinical toxicology rotation, including: (1) baseline knowledge assessment examining SJS presentation, diagnosis, and management; (2) small-group simulated scenarios featuring a standardized patient with SJS secondary to lamotrigine, requiring history-taking, physical examination, differential diagnosis generation, and management initiation; (3) structured debriefing using advocacy-inquiry techniques to explore clinical reasoning. Critical action checklists standardized performance assessment, and post-simulation questionnaires captured learner perspectives.

#### Results

Thirty-four students participated with no exclusions. Mean pretest scores of 64.4% (SD 21.38) increased to 98.9% (SD 4.74) post-intervention, (Wilcoxon signed-rank test statistic = 0.0,  $p < 0.000001$ ). All participants demonstrated knowledge gains in recognition and management. Critical action checklists showed universal identification of causative medication discontinuation and supportive care initiation following debrief. Post-simulation questionnaires revealed high satisfaction and increased confidence in managing future SJS cases.

#### Conclusion

This innovation statistically improved medical student knowledge of SJS while providing safe, controlled practice. Limitations include a small single-institution sample, resource-intensive small-group facilitation limiting scalability, lack of long-term retention or clinical transfer assessment, and relevance mainly to specialties managing dermatologic emergencies. Future work should include delayed retention assessment, evaluation of clinical performance during residency, multi-institutional implementation, scalable formats (virtual simulation), and expanding to include toxic epidermal necrolysis to broaden applicability. Overall, SBME is a feasible and effective strategy for preparing students to manage rare dermatologic emergencies where simulation resources are available.

# Poster Presentation

Round 1 (11 AM - 12 PM)

18

## Same Overdose, Different Management: A Novel Approach to Teaching Acetaminophen Overdose

### Contributors:

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### Abstract:

#### BACKGROUND

Acetaminophen (APAP) is a commonly used over-the-counter medication. APAP overdose is prevalent, with approximately 56,000 emergency department visits annually, and is the leading cause of acute liver failure in the U.S.. Overdose is treated with N-acetylcysteine (NAC). For decades, its dosage was determined based on patient weight rather than the amount ingested. In 2021, clinical guidelines introduced high-dose NAC for cases involving massive acetaminophen ingestion. We aim to provide a simulation case learning tool for medical students on massive APAP overdose.

#### METHODS

We conducted a quasi experimental pretest posttest study. Fourth-year medical students took a pretest on APAP, then attended a lecture followed by three simulated cases of APAP overdoses that varied in timing and magnitude. Students completed a focused toxicological history and physical examination and administered NAC in regular or high doses as appropriate. Variations in clinical presentations allowed for student practice with the treatment algorithm, including oral NAC or adjuncts with fomepizole. Outcome measures were a posttest.

#### RESULTS

Seventy-five students participated. Mean pretest and posttest scores were 55.93% (SD 17.7) and 89.98% (SD 9.1), respectively. A Wilcoxon signed-rank test demonstrated a statistically significant improvement in scores ( $W = 0, p < 0.0001$ ). On the Likert questionnaire, students reported that the workshop length and content were appropriate for their level of training, valued the opportunity to apply their knowledge in a simulated environment, and would use the approach to a poisoned patient practiced with simulated patients in their clinical work.

#### CONCLUSION

Updates to clinical guidelines may complicate decision-making in the management of APAP overdoses. Simulations provide an opportunity to treat it in a controlled setting prior to encountering it in clinical practice. Variations in APAP overdose cases allow for strengthening of diagnostic skills in accordance with updated clinical guidelines.

# Poster Presentation

Round 1 (11 AM - 12 PM)

19

## Workflow Optimization for Eliciting and Implementing What "Matters Most" in Geriatric Primary Care

### Contributors:

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### Abstract:

#### Background:

Multimorbidity among older adults can complicate clinical decision-making, particularly when patients' priorities and goals are unknown or conflicting. Incorporating patient goals—what “matters most” (WMM)—can reduce treatment burden, unwanted interventions, and unnecessary utilization, while improving communication. Little is known about integrating structured tools into clinic workflows and electronic health records (EHRs). This project assessed the use of a standardized WMM tool into routine geriatric primary care visits, aiming to: (1) evaluate workflow integration; (2) assess provider perspectives; (3) identify key components for EHR integration.

#### Methods:

This cross-sectional quality improvement study was conducted over three weeks. Patients scheduled with two providers were offered the WMM form at check-in, and could complete it during rooming. Forms were reviewed by the provider and scanned into the EHR. Measures included forms distributed, form completion, and commonly selected components. Team perspectives were assessed through brief focused interviews. Data were analyzed descriptively.

#### Results:

During the pilot, 81 forms were distributed across 133 visits, with 76 at least partially completed. Of form components, 95% of patients identified initial values, 47% selected top 3 values, and 70% identified healthcare goals. The most commonly selected values centered around mentation, mobility, enrichment, and connection. Greater than half of patients identified “have good relationships with family or friends” (70%), “spend time with family and friends” (66%), “think clearly” (64%), and “walk or move around by myself” (58%). Provider interviews indicated that the WMM form supported patient reflection and helped them understand priorities, especially for new patients. Suggested improvements included simplifying the form due to time constraints.

#### Conclusions:

Initial findings suggest that integrating a structured WMM form into routine care is feasible and acceptable. This work identified insights to guide EHR integration of this tool. Future efforts will refine the tool, guide EHR development, and assess patient-reported outcomes in broader implementation.

# Poster Presentation

Round 1 (11 AM - 12 PM)

20

## Insomnia and Recovery Capital Among Men and Women with Opioid Use Disorder

### Contributors:

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### Abstract:

**Background:** Sleep disturbances are common among people with Opioid use Disorder (OUD) and may negatively impact recovery outcomes and overall well being. Recovery capital, defined as internal and external resources that individuals with substance use disorders may accumulate to sustain their recovery, plays a critical role in long term recovery. The connection between sleep disturbances and recovery capital among people with OUD is unexplored. This study examines sleep disturbances and recovery capital among individuals in OUD treatment with buprenorphine.

**Methods:** This is a secondary analysis of data from the Sleep in Opioid Use Disorder Recovery & Treatment (SORT) study. SORT participants included adults stabilized on buprenorphine recruited from an outpatient clinic between 2022-2023 (recruitment rate 78.8%). Participants completed an electronic survey which included demographic questions, the Insomnia Severity Index (ISI), and assessed recovery capital via the Substance Use Recovery Evaluator (SURE, range 21-63, higher scores indicate more capital). Participants were classified as having clinically significant insomnia symptoms if  $ISI \geq 11$ . Descriptive statistics were used to capture sample demographics. Independent sample t-tests were used to assess differences between participants with and without insomnia on different recovery capital domains.

**Results:** The majority of participants ( $N=129$ ) were cisgender women (62%), 55.8% were white and 35.6% Black; mean duration of buprenorphine receipt was 2.52 years ( $SD = 2.3$ ). Seventy six (58.9%) participants reported clinically significant insomnia symptoms. Overall, SURE scores were higher in participants with  $ISI \leq 10$  ( $M=56.8$ ,  $SD=7.0$ ) and lower among participants with  $ISI \geq 11$  ( $M=50.2$ ,  $SD=8.1$ ). On the SURE subscales, participants with clinically significant insomnia had lower scores on measures related to selfcare ( $p<0.001$ ) and life outlook ( $p=0.005$ ).

**Conclusions:** Sleep disturbances were common in this sample and were related to less recovery capital. Those with greater insomnia symptoms report lower levels of self-care and less positive outlook on life. These results underscore the potential positive role that addressing sleep health in the context of outpatient buprenorphine-based treatment could have on long-term OUD recovery outcomes.

# Poster Presentation

Round 1 (11 AM - 12 PM)

21

## Same Presentation, Different Diagnosis: Using Parallel Mock Oral Examinations to Teach the Differential Diagnosis of Galactorrhea

### Contributors:

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### Abstract:

**Background:** Mock oral examinations are an underutilized educational tool in medical training, often relying on isolated, specialty-specific scenarios. Galactorrhea, though frequently associated with obstetrics and gynecology, presents a broad differential that includes endocrine, oncologic, and iatrogenic causes—making it a relevant topic for internal medicine. Despite this, it is often overlooked or prematurely referred to subspecialists. To enhance diagnostic reasoning and interdisciplinary thinking among internal medicine trainees, we developed a series of three nearly identical mock oral board cases centered on galactorrhea. This study aimed to assess whether presenting medical trainees with nearly identical oral board cases could enhance their medical knowledge and reduce diagnostic tunnel vision when managing galactorrhea.

**Methods:** We conducted a quasi-experimental pretest-posttest study. Participants completed a pretest then engaged in three oral board-style cases featuring a 26-year-old patient with galactorrhea, each with subtle variations in patient history and findings, leading to three distinct diagnoses and management strategies: hypothyroidism, prolactinoma, and medication side effects. Learners then received a structured debrief and took a posttest.

**Results:** Mean pretest and posttest scores were 49% and 98%, respectively. A Wilcoxon signed-rank test demonstrated a statistically significant difference ( $W = 0, p < 0.001$ ).

**Conclusion:** Traditional oral board cases can be modified by presenting multiple cases with subtle variations to prevent tunnel vision, particularly through structured debriefing. This innovation demonstrates that triplet oral boards are a feasible and effective method to strengthen diagnostic reasoning in medical students. Strengths include reproducibility and statistically significant improvement in medical knowledge. Limitations include a small sample size, significant time requirements, and limited generalizability beyond the fields of gynecology, psychiatry, internal medicine, and family medicine. Based on these data, we have incorporated this teaching methodology into the medical education curricula and have expanded the content to include postpartum headache, facial droop, paralysis, shock, and altered mental status.

# Poster Presentation

Round 1 (11 AM - 12 PM)

22

## Synergistic Antitumor Effect of Triple Therapy with Sildenafil, Rapamycin and Doxorubicin in Breast Cancer with Mitigation of Cardiotoxicity

### Contributors:

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### Abstract:

**Background:** Doxorubicin (DOX) is essential for breast cancer treatment but causes cardiotoxicity and drug resistance. Our previous work demonstrated that sildenafil (Sild, phosphodiesterase-5 inhibitor) potentiates DOX efficacy while ameliorating cardiotoxicity, and rapamycin (Rapa, mTOR inhibitor) protects against myocardial injury. We hypothesized that combined Sild+Rapa would further enhance DOX chemosensitivity while mitigating cardiotoxicity.

**Methods:** Murine 4T1 breast cancer cells were treated with DOX (1  $\mu$ M)  $\pm$  Sild (10  $\mu$ M) and Rapa (100 nM) for 24-48 hours. Female Balb/c mice with orthotopic 4T1 tumors received DOX (3 mg/kg, twice weekly, 5 doses)  $\pm$  Sild (1.4 mg/kg daily, oral) and Rapa (0.25 mg/kg, twice weekly). Molecular analysis, tumor metrics, and cardiac function were assessed.

**Results:** In vitro, Sild+Rapa+DOX significantly suppressed 4T1 cell viability and enhanced cell death versus DOX alone, with Western blot showing reduced mTOR/AKT/S6 phosphorylation and elevated cleaved-PARP. In vivo, DOX alone reduced tumor growth; however, triple therapy further attenuated tumor weight. Critically, DOX alone significantly impaired cardiac systolic function (LVEF:  $39 \pm 1.2\%$  vs. control  $57 \pm 1.4\%$ ). Triple therapy remarkably restored cardiac function to baseline (LVEF:  $57 \pm 2.1\%$ ). TUNEL assay confirmed that Sild+Rapa suppressed DOX-induced cardiomyocyte apoptosis.

**Conclusion:** Combined sildenafil and rapamycin represents a novel strategy to simultaneously enhance DOX chemosensitivity and prevent cardiotoxicity. This triple therapy approach warrants clinical investigation to improve outcomes in breast cancer patients receiving anthracycline-based chemotherapy.

# Poster Presentation

Round 1 (11 AM - 12 PM)

23

## Emergency Department Utilization and Opioid Use in Migraine Patients Treated With CGRP Inhibitors Versus Traditional Preventive Therapies

### Contributors:

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### Abstract:

CGRP inhibitors are the first migraine-specific preventive therapies and target the calcitonin gene-related peptide (CGRP) pathway, a key mediator of neuroinflammation and vasodilation in migraine. Unlike traditional preventive medications such as beta-blockers, antiepileptics, and antidepressants, which were developed for other conditions, CGRP inhibitors lack major cardiovascular and psychiatric contraindications. Triptans, a traditional migraine-specific medication, are currently only indicated for acute migraine attacks and also carry cardiovascular contradictions. Given the significant burden of migraine-related emergency department (ED) visits and the frequent use of opioids despite guideline recommendations discouraging their use, evaluating whether improved prevention reduces acute care utilization is clinically relevant.

We conducted a retrospective cohort study using TriNetX electronic health record data to identify adults with migraine prescribed either CGRP inhibitors or traditional preventive medications. Propensity score matching was used to reduce confounding between groups. Primary outcomes included ED visits for headache/migraine and opioid prescriptions over 12 months. Kaplan-Meier analysis and Cox proportional hazards regression were used to compare outcomes between cohorts. Outcomes will also be stratified by individual CGRP agents.

This study addresses a gap in direct comparisons between CGRP inhibitors and traditional preventive therapies using ED visits and opioid exposure as primary outcomes. Findings may inform value-based prescribing decisions, reduce ED resource burden, and decrease opioid exposure among patients with migraine.

# Poster Presentation

Round 1 (11 AM - 12 PM)

24

## The Importance of PSMA PET/CT Findings in the Initial Staging and Management of Patients with Newly Diagnosed Prostate Cancer

### Contributors:

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### Abstract:

#### Background

Prostate-specific membrane antigen positron emission tomography/computed tomography (PSMA PET/CT) has demonstrated high sensitivity for detecting prostate cancer (PCa) metastases, influencing initial staging and management. We evaluated the impact of PSMA PET/CT on detection of metastatic disease and subsequent treatment modification in patients undergoing initial staging for newly diagnosed PCa.

#### Methods

A retrospective review of 611 patients who underwent prostate biopsy between 1/04/2023 and 05/01/2025 was performed. Patients with newly diagnosed PCa who underwent PSMA PET/CT for initial staging were included; those with prior surgery or radiation were excluded. Collected data included age, prostate-specific antigen (PSA), Prostate Imaging Reporting and Data System (PI-RADS) scores from multiparametric MRI (mpMRI), and Gleason score (GS) from image-guided biopsy. The presence of metastases on PSMA PET/CT and associated treatment modifications were recorded. 137 patients met inclusion criteria. Statistical analysis was performed using GraphPad Prism v11.0.0.

#### Results

All 137 patients underwent mpMRI prior to biopsy and subsequent PSMA PET/CT for staging. PSMA PET/CT identified metastases in 38 patients. 4 patients demonstrated suspected metastases on conventional imaging without PSMA PET/CT correspondence. Therefore, treatment plans were altered in 30.7% (42/137). Patients with  $GS \geq 8$  had a higher rate of metastatic disease compared to those with  $GS \leq 7$  (44.3% vs 10.8%; Fisher's exact  $p < 0.0001$ ). Mean age was  $67(\pm 7)$  years. Mean PSA at diagnosis was higher in patients with metastases than in those without ( $86.79 \pm 187.2$  vs  $20.83 \pm 42.24$  ng/mL;  $p = 0.038$ ).

#### Conclusion

PSMA PET/CT identified metastases in over one-quarter of newly diagnosed patients and led to treatment modification in 30.7%. High-grade PCa ( $GS \geq 8$ ) was strongly associated with metastatic involvement, supporting the role of PSMA PET/CT in risk-adapted initial staging.

# Poster Presentation

Round 1 (11 AM - 12 PM)

25

## Non-invasive Detection of Detrusor Overactivity with Bladder Near-infrared Spectroscopy in OAB Patients

### Contributors:

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### Abstract:

Detrusor overactivity (DO) involves involuntary bladder contractions that drive overactive bladder (OAB) symptoms, such as urgency. Urodynamic studies (UDS) remain the gold standard for diagnosing DO, but they are invasive and resource-intensive. Near-infrared spectroscopy (NIRS) measures tissue hemodynamics and may provide a cost-effective alternative. This study assesses bladder NIRS for identifying DO in OAB patients.

OAB patients completed simultaneous bladder NIRS and UDS testing. For confirmed DO events, peak and area under-the-curve (AUC) values were determined using detrusor pressure (pDet) and NIRS-derived oxygenated hemoglobin (O<sub>2</sub>Hb). NIRS segments during DO events were compared to segments in the same participants without DO (internal control) and to segments from different participants without DO (external control). Motion artifacts were corrected, and a linear fit was subtracted to account for drift. Normalized NIRS AUC was calculated over the testing period. Forty-four female OAB patients were enrolled, including 12 with confirmed DO, yielding 39 DO events. Mean pDet peak during DO events ( $51.8 \pm 7.3$  cm H<sub>2</sub>O) was higher than internal ( $3.7 \pm 0.5$  cm H<sub>2</sub>O), and external ( $5.4 \pm 1.2$  cm H<sub>2</sub>O) controls ( $p < 0.001$ ). NIRS O<sub>2</sub>Hb were similarly elevated ( $p < 0.001$ ). pDet AUC was  $30,988 \pm 7,318.2$  (DO),  $444.5 \pm 86.7$  (internal control), and  $1,036.6 \pm 352.9$  (external control), with similar outcomes in NIRS O<sub>2</sub>Hb ( $p < 0.001$ ). Normalized NIRS AUC was higher in DO patients ( $0.56 \pm 0.11$ ) than external controls ( $0.09 \pm 0.01$ ,  $p < 0.001$ ). A threshold AUC of 0.146 distinguished segments with and without DO ( $p < 0.05$ ). DO events were associated with significantly increased pDet and NIRS O<sub>2</sub>Hb compared with control segments. These results support bladder NIRS as a potential non-invasive tool for detecting DO in OAB patients.

# Poster Presentation

Round 1 (11 AM - 12 PM)

26

## Post-immunotherapy Lineage Switch as a Mechanism of Relapse in Acute Leukemia: A Case Series

### Contributors:

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### Abstract:

#### Background:

Lineage switch (LS) from B-cell acute lymphoblastic leukemia (B-ALL) to a myeloid or lineage-ambiguous phenotype is an emerging mechanism of treatment failure after CD19-directed immunotherapy. While most reports involve pediatric or KMT2A-rearranged disease, its clinical and molecular features in adults are poorly defined.

#### Methods:

We retrospectively analyzed adults with B-ALL at a single institution who developed LS. Clinical features, immunophenotype, measurable residual disease (MRD), cytogenetics, next-generation sequencing, therapy, and outcomes were reviewed. Clonal relatedness was confirmed by persistence of antecedent genomic alterations and/or immunoglobulin gene rearrangements.

#### Results:

Four adults (median age 62.5 years; range 49–78) developed LS at a median of 365.8 days from diagnosis and 269.8 days from their most recent CD19-directed therapy (blinatumomab, n=2; inotuzumab ozogamicin, n=2). Two patients switched despite MRD-negative remission. Founding genomic alterations persisted in all cases, confirming clonal evolution. Cytogenetic progression was universal, including complex karyotype, KMT2A amplification, and chromosome 17 abnormalities; three patients acquired TP53 mutations at or after LS. Transformation was marked by loss of CD19/CD22 and emergence of myeloid or lineage-ambiguous blasts; one patient evolved to secondary myelodysplastic syndrome. Outcomes were poor: one patient died within three months of LS and one during AML-directed therapy; one remains on palliative treatment, and one achieved morphologic remission with persistent molecular disease and is proceeding to allogeneic transplantation. Median overall survival from LS was 56 days (range 8–104).

#### Conclusions:

In adults, LS can occur rapidly after CD19-directed therapy, including in MRD-negative remission, and carries a dismal prognosis. Retention of founding lesions with acquisition of high-risk mutations supports immune-driven clonal evolution. These findings highlight the need for vigilant surveillance and therapies targeting lineage plasticity.

# Poster Presentation

Round 1 (11 AM - 12 PM)

27

## IL-33-Mediated Mast Cell and Eosinophil Function Requires Isoprenylation

### Contributors:

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### Abstract:

Allergic disease is a common and symptomatically heterogeneous group of inflammatory disorders marked by overactive Th2 and mast cell (MC) responses along with eosinophil infiltration. Treatment options require continual assessment due to breakthrough symptoms on standard regimens. One approach to improved therapy is drug repurposing. We previously showed that cholesterol-lowering statin drugs can suppress IgE-mediated MC function by inhibiting protein isoprenylation, a pathway using cholesterol biosynthesis intermediates. Additionally, MCs are activated by the alarmin IL-33. We hypothesized that IL-33-mediated MC function can be inhibited by disrupting isoprenylation via statins or the dual farnesyltransferase (FT) geranylgeranyltransferase-1 inhibitor, FGTI-2734.

We used IL-33 to stimulate MCs and eosinophils in vitro and inhibited their function using simvastatin and FGTI-2734. Using primary MCs and eosinophils, we measured cytokine production by ELISA and qPCR. Flow cytometry and western blots were used to measure phosphorylation of IL-33 signaling components, and eosinophil migration. Human MCs were assessed by ELISA for cytokine inhibition. Lastly, a murine model of IL-33 induced peritonitis was used to assess the effects of isoprenylation inhibition on eosinophil and neutrophil influx.

Simvastatin and FGTI-2734 suppressed IL-33-mediated cytokine protein and mRNA production in primary murine MCs from the C57BL/6 strain. Simvastatin effects were lost on MCs from the 129/SvJ strain and were inconsistent among primary human MCs. In contrast, FGTI-2734 inhibited IL-33-induced cytokine production by MCs on the 129/SvJ strain and among human donors. Simvastatin and FGTI-2734 also inhibited IL-33-induced cytokine production and chemokine-induced migration of C57BL/6 primary eosinophils. Simvastatin and FGTI-2734 had no effect on expression of the IL-33 receptor, ST2, suggesting that inhibition occurs at a step in IL-33 signaling. Importantly, FGTI-2734 significantly reduced eosinophil and neutrophil influx in a model of IL-33-induced peritonitis, whereas simvastatin had no effect.

These findings indicate that targeting FT and GGT-1 is a viable target in IL-33-induced inflammation.

# Poster Presentation

Round 1 (11 AM - 12 PM)

28

## **Determinants of Surgical Approach for Colorectal Cancer Patients: Analysis of Patient, Hospital, and Environmental Characteristics**

### **Contributors:**

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### **Abstract:**

**Background:** Colorectal cancer is the third most diagnosed cancer and the second most common cause of deaths due to cancer worldwide. Some studies show minimally invasive surgery (MIS) having better outcomes for patients, open surgery is still performed often for colorectal cancer patients. This project proposes a framework to address differences in surgical approach (open vs. MIS) for colorectal cancer patients while examining the influence of different patient and hospital characteristics.

**Methods:** We conducted a retrospective analysis studying the utilization of open surgery vs. MIS for colorectal cancer patients. The study identified patients who underwent MIS, including laparoscopic and endoscopic, and open surgical resection of the colon from the Inpatient Databases of the Agency for HCUP SID. We linked this patient-level data to American Hospital Association Annual Survey, Area Health Resource files, and other national sources. Our sample included colorectal cancer patients across 15 states from 2009 to 2019.

**Results:** Our study population consisted of 420,101 patients who received surgery for colorectal cancer treatment. Of these, 34.1% underwent MIS and 61.5% received open surgery. 34.2% of White patients received MIS, compared to 32.7% of Black patients and 33.3% of Hispanic patients. 55.5% of the patients were on Medicare, 32.0% had private insurance, and 8.51% had Medicaid. For those who had Medicare, 35.0% had MIS and 61.7% received open surgery. With private insurance, 36.5% had MIS and 57.4% had open. For Medicaid users, 23.3% received MIS, and 71.5% received open surgery.

**Conclusion:** Surgical approach for colorectal cancer is dependent on several factors beyond cancer biology. Further research looking into potential barriers for surgical access and specifically the use of open compared to minimally invasive surgery is needed to promote equitable access to surgical care.

# Poster Presentation

Round 1 (11 AM - 12 PM)

29

## A Rare Case of Angioinvasive Cutaneous Curvularia Mimicking Invasive Aspergillosis in a Liver Transplant Recipient with Acute Graft-Versus-Host Disease (GVHD)

### Contributors:

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### Abstract:

#### Background:

Curvularia species are dematiaceous molds that rarely cause invasive infection. Most reported cases occur in patients with hematologic malignancy or following stem cell transplantation, with only rare cases described in solid organ transplant recipients. Acute graft-versus-host disease (GVHD) after liver transplantation is uncommon but can result in immune dysfunction and increased susceptibility to opportunistic infections.

#### Case Description:

We report a case of angioinvasive cutaneous Curvularia infection in a 59-year-old man who developed acute GVHD following liver transplantation. Two months post-transplant, he developed a violaceous nodule at the site of a prior IV catheter while home in Puerto Rico. Biopsy demonstrated angioinvasive septated hyphae on histopathology, a pattern classically associated with invasive aspergillosis and initially raising concern for that diagnosis. However, serum galactomannan testing was negative, and tissue cultures ultimately grew Curvularia species, confirming angioinvasive cutaneous phaeohyphomycosis. Despite antifungal therapy, disease progression required surgical excision in addition to medical management.

#### Results:

The infection was ultimately controlled with combined antifungal therapy and surgical resection. This case highlights diagnostic challenges due to histopathologic similarity between dematiaceous molds and Aspergillus, as well as management complexity due to thrombocytopenia and interruptions in azole therapy due to hepatotoxicity.

#### Conclusions:

Invasive Curvularia infection is rare in solid organ transplant recipients but should be considered in patients with GVHD who develop nodular skin lesions at a prior IV catheter site. Early biopsy with histopathology and culture, along with combined medical and surgical management, can help limit disease progression.

# Poster Presentation

Round 1 (11 AM - 12 PM)

30

## Acute-On-Chronic Carbamazepine Overdose: A Toxicology Simulation Case for Fourth-Year Medical Students

### Contributors:

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### Abstract:

#### Background

Carbamazepine overdose, though relatively common, is overshadowed by other overdoses in medical curricula. To address this knowledge gap, we created a simulated case of a patient presenting with acute-on-chronic carbamazepine overdose coupled with a didactic lecture. This study aimed to examine whether medical students could effectively learn key management steps and pathophysiology of carbamazepine overdose through a novel simulation.

#### Methods

This study used a quasi-experimental pretest-posttest design. Fourth-year medical students enrolled in a toxicology course took a pretest on carbamazepine and then received a lecture on carbamazepine. Afterwards, they participated in a simulated case of carbamazepine overdose. In the simulated case, students were presented with a realistic manikin patient and performed a toxicological history and neurologic exam before receiving a structured debrief that included a review of various clinical presentations of carbamazepine overdose and an opportunity to explore multiple treatment pathways. Students were evaluated using a critical actions checklist and a posttest.

#### Results

Sixty-seven students participated in the study; Mean pretest and posttest scores were 71% and 98%, respectively. A Wilcoxon signed-rank test analysis showed a statistically significant increase in scores (test statistic: 0.0,  $p < 0.0001$ ). All simulation groups completed the items on the critical actions checklist within 15 minutes or less.

#### Conclusion

We designed this case simulation to present students with a real-world example of carbamazepine overdose within a structured, safe environment. Our study demonstrates that student knowledge on carbamazepine pharmacology and toxicity can be improved via use of simulation.

# Poster Presentation

Round 1 (11 AM - 12 PM)

31

## Vaginal Estrogen and Sildenafil Prescription Medicare Coverage: A Cross-Sectional Study

### Contributors:

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### Abstract:

Our objective was to describe the insurance coverage of commonly prescribed generic vaginal estrogen (VE) formulations in terms of overall coverage score and Medicare plan costs. Estrogen replacement therapy is an essential treatment that's becoming more necessary as our population ages. There are growing disparities in medical coverage between men and women. It's critical to understand the barriers to getting coverage for VE formulations.

This cross-sectional study examined coverage scores, tiers, and costs of VE formulations in the United States. Census data was used to identify the three most populous zipcodes in each state. The coverage tier/cost for estradiol cream, Yuvaferm, and sildenafil were recorded for all insurance plans of the top seven Medicare insurers per zipcode. Each formulation received a weighted coverage score ranging from 0.2 to 1.0 based on tier coverage. A higher coverage score conferred better coverage.

1,942 plans were analyzed. Estradiol cream had the highest coverage score of 0.67

compared to Yuvaferm (0.55) or sildenafil (0.4). The median cost was \$20.50 (IQR \$16.50-42.50), \$39 (IQR \$33-43), and \$16 (IQR \$16-319) for estradiol cream, Yuvaferm, and Sildenafil, respectively. Anthem had the lowest coverage scores for Yuvaferm (0.40) and estradiol cream (0.58). Kaiser had the best coverage scores for estrogen medications (0.80). Alaska had the lowest coverage scores for Yuvaferm (0.37) and estradiol cream (0.53), while Mississippi had the best for both (0.66 and 0.77, respectively). South Dakota had the worst coverage score for sildenafil (0.33), while Florida had the highest (0.58).

Despite a lower coverage score than the estrogen formulations, sildenafil may be more affordable for men than VEs are for women. Living in Alaska or having Anthem insurance may result in worse coverage of VEs.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Cryoneurolysis for Chronic Neuropathic Pain: Techniques and Clinical Outcomes

### Contributors:

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### Abstract:

Learning Objectives:

- (1) Identify procedural details of standard cryoablation interventions
- (2) Compare long term efficacy of cryoablation with standard pharmacological and interventional therapy for chronic neuropathic pain
- (3) Describe contraindications and side effects of cryoablation interventions
- (4) Elaborate on subtypes of chronic pain where cryoablation interventions seem most promising and future directions to be pursued in the field.

Background: Chronic neuropathic pain presents as a sharp, shooting pain that radiates along a damaged section of nerve. Current management focuses on the use of NSAIDs, opioids, and local nerve blocks which provide effective, albeit transient, pain relief. Cryoanalgesia and cryoablation offer the advantage of a long-term intervention that carries an improved side effect profile in comparison to standard pain management of neuropathic pain.

Clinical Findings/Procedure Details: Cryoablation of the nerves for symptomatic pain relief is known as "cryoneurolysis" or "cryoneuroablation." The procedure is performed percutaneously under ultrasound or fluoroscopic guidance, where pressurized N<sub>2</sub>O or CO<sub>2</sub> at the probe tip freezes and ablates the target nerve. Unlike alcohol or phenol injections, which may cause neuritis or neuralgia, cryoneurolysis does not carry these complications.

Clinical outcomes have supported the effectiveness of this technique in those with refractory peripheral neuropathy. In one prospective study of 22 patients, baseline pain levels were an average  $8.3 \pm 1.9$  on the VAS scale. At 1 month post-treatment, pain scores significantly decreased to  $2.3 \pm 2.5$  and despite some recurrence, they remained decreased at  $5.1 \pm 3.7$ . Importantly, no complications were reported emphasizing the favorable safety profile of the technique.

Conclusion: Peripheral nerve cryoablation holds promise in providing significant pain relief to those with refractory chronic neuropathies compared to current medical management. The reduced side effects and minimal complications with sustained long term effects calls for broader integration and further study.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Differences in Postpartum Pain Scores and Treatment Response Following Cesarean Section Birth

### Contributors:

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### Abstract:

#### Background:

Postpartum pain is a marker of maternal morbidity and influences postpartum outcomes including opioid use, chronic pain, and depression. Prior studies have demonstrated racial and sociodemographic disparities in pain management. Patients with Black or Hispanic race, younger age, non-native primary language, and public insurance often receive fewer opioids despite similar or higher reported pain scores. Similar disparities exist in postpartum complication rates such as readmission, emergency department visits, infection, and prolonged length of stay. This study aims to explore the relationships between demographics and postpartum pain scores, treatment response, and outcomes, locally.

#### Methods:

This retrospective cohort study includes patients that underwent cesarean section birth at VCU from January 1, 2024- January 1, 2025. Independent variables include age, race, primary language, and healthcare insurance status. Primary outcomes include mean pain score, type of analgesic received, and morphine milligram equivalents received at 0-24, 24-48, and 48+ hours after birth. Secondary outcomes are 42-day complication rates (i.e., readmission, hospital encounters, infection, and length of stay). Patients with opioid use disorder, major perioperative complications, general anesthesia, vaginal birth, or missing data were excluded.

#### Results:

Data collection is complete; analyses are ongoing. Statistical methods include descriptive statistics, bivariate testing, and multivariable regression using SAS and R.

#### Conclusions:

While the literature demonstrates disparities in postpartum pain and treatment response at other institutions across the nation, there is a gap in knowledge regarding whether the same patterns are present at VCU. We hypothesize non-White patients will report higher pain scores; younger patients, non-White patients, non-English speakers, and publicly insured patients will receive fewer opioids; and older patients and these groups will have higher complication rates. Ultimately, findings aim to highlight disparities, if they exist, and identify potential areas for quality improvement to reduce maternal mortality, morbidity, and inequity on the local level.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## **Congenital Hairy Polyp of the Oral Cavity: Two Neonatal Cases and a Scoping Review of Nasal and Oropharyngeal Masses Presenting With Feeding Difficulty**

### **Contributors:**

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### **Abstract:**

#### Background

Neonatal feeding difficulty and airway obstruction require prompt evaluation to prevent morbidity. Congenital hairy polyps are rare, benign developmental lesions arising from the tonsillar pillar or nasopharynx and may present with respiratory compromise and impaired feeding. Due to their rarity, there is limited guidance regarding diagnostic evaluation, surveillance, and management. We present two neonatal cases and conduct a scoping review to better characterize presentation patterns and management strategies for congenital nasal and oropharyngeal masses associated with feeding difficulty.

#### Description

We describe two neonates within a single hospital system who presented with feeding difficulty and symptoms concerning for upper airway obstruction. Both patients underwent flexible fiberoptic nasopharyngoscopy, imaging evaluation, and surgical excision. In addition, a scoping review of the literature (1970–present) was conducted to identify neonatal nasal and oropharyngeal masses associated with feeding impairment. Extracted variables included age at presentation, clinical symptoms, diagnostic modalities, pathology, management approach, and outcomes.

#### Results

Both neonates presented in the early postnatal period with feeding intolerance and signs of airway compromise. Endoscopic evaluation revealed pedunculated oropharyngeal masses consistent with hairy polyps, confirmed by histopathology following surgical excision. One patient required revision excision and serial MRI surveillance due to concern for residual tissue. The literature review identified additional cases of hairy polyps and other lesions presenting with feeding and airway compromise, including vallecular cysts, mucocoeles, and ankyloglossia. Flexible endoscopy was the primary diagnostic modality, with surgical excision serving as definitive treatment for most mass lesions.

#### Discussion

Congenital hairy polyps, though rare, are important causes of neonatal feeding difficulty and airway obstruction. Early endoscopic evaluation is critical for diagnosis. Complete surgical excision is recommended, with consideration of postoperative imaging surveillance in select cases. Increased awareness of these lesions and their differential diagnoses may improve early identification, guide management decisions, and reduce feeding-related morbidity in affected newborns.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Real-World vs. Clinical Trial Data of Belantamab mafodotin's Ocular Toxicities: A Comparative Analysis

### Contributors:

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### Abstract:

**Introduction:** Belantamab mafodotin is an antibody-drug conjugate that is used for treatment of relapsed/refractory Multiple Myeloma (RRMM). While it has demonstrated potential, this medication presents with serious ocular toxicities, specifically keratopathy. Thus, this study examines the incidence of ocular toxicities in real-world RRMM patients using Belantamab mafodotin, compared to rates reported in a key clinical trial (DREAMM-2).

**Methods:** Trinetx, a real-world data platform, was used to assess outcomes in RRMM patients using Belantamab mafodotin. Through Trinetx's US Collaborative Network, we evaluated patients' demographics and treatment-related adverse events. Findings from Trinetx were then compared to published literature from the DREAMM-2 clinical trial.

**Results:** On Trinetx, 345 patients with RRMM were treated with Belantamb mafodotin with a mean age of 72 years old, and a patient population that was 69.9% White and 15.4% Black. The DREAMM-2 clinical trial had a median age of 65 years old, and a patient population that was 74.2% White and 16.5% Black.

71/330 (21.5%) of Trinetx patients experienced keratopathy. In relation, in the DREAMM-2 study, 67/95 (70.5%) of patients complained of this adverse effect. When comparing real-world patients to clinical trial patients, we observed an odds ratio of 0.11 (CI: 0.07 to 0.19) for keratopathy.

**Conclusions:** There is a significant difference in the reported risk of keratopathy, when comparing the Trinetx data to the DREAMM-2 clinical trial. Upon consideration, we hypothesize this discrepancy could be caused by a lack of regular follow-up and underreporting in the real world. We also believe that there is better monitoring of toxicities in a clinical trial, leading to drug therapy interruption. Ultimately, due to the adverse side effect that is present in both cohorts, this medication should continue to be clinically evaluated to ensure safety in RRMM patients.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Health, Quality of Life, and Insomnia Among Individuals with Opioid Use Disorder

### Contributors:

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### Abstract:

**Background:** Sleep disturbances are common among individuals with opioid use disorder (OUD) and may contribute to reduced quality of life (QoL) and physical and mental health concerns. The role that sex differences play in these relationships is understudied. This study examined sex differences in insomnia, QoL, and patient-reported overall health status among individuals in buprenorphine treatment for OUD.

**Methods:** This is a secondary analysis of cross-sectional survey data from the Sleep in Opioid Use Disorder Recovery & Treatment (SORT) Study. SORT participants included adults stabilized on buprenorphine recruited from an outpatient medicine clinic between 2022-2023 (recruitment rate 78.8%). Participants completed an online survey which included demographic items, the Insomnia Severity Index (ISI), the PROMIS-10 overall health measure, and a Likert scale question asking participants to rate their QoL from 1-5. Descriptive statistics were used to summarize sample characteristics. Participants were coded as having insomnia if they scored  $\geq 11$  on the ISI. One-way ANOVAs and post-hoc Tukey tests were used to compare men and women with insomnia to those without insomnia on the QoL and PROMIS-10.

**Results:** The majority of participants ( $N=129$ ) were white (54.3%) and women (60.9%), and 58.5% scored  $\geq 11$  on the ISI. Mean duration of buprenorphine receipt was 2.52 years ( $SD = 2.3$ ). Insomnia severity was significantly negatively correlated with PROMIS-10 ( $r = -0.53, p < 0.001$ ) and QoL ( $r = -0.318, p < 0.001$ ) scores and significantly positively correlated with identifying as female ( $r = 0.206, p = 0.019$ ). There were significant group differences in PROMIS-10 scores ( $F(3,119) = 7.629, p < 0.001$ ). Men with insomnia had the lowest PROMIS-10 scores ( $M=26.58$ ), followed by women with insomnia ( $M=27.20$ ), men without insomnia ( $M=31.68$ ), and women without insomnia ( $M=34.38$ ). There were significant group differences in QoL scores,  $F(3, 105) = 2.06, p = .026$ .

**Conclusions:** Among people receiving buprenorphine in outpatient OUD treatment, insomnia may be related to poorer physical and mental health outcomes and reduced QoL. The relationship between insomnia, patient-reported overall health status, and sex is complex and warrants further research. Results from this study underscore the potential impact that interventions which account for sex differences could have when addressing sleep disturbances among people with OUD.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## HLA-B\*58:01 Testing for Prevention of Severe Cutaneous Adverse Reactions: Investigating Gaps in Implementation

### Contributors:

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### Abstract:

#### Background

Current clinical guidelines by the American College of Rheumatology conditionally recommend HLA-B\*58:01 testing prior to initiating allopurinol in select high-risk populations, such as Southeast Asian or African American patients, while recommending against universal testing in other groups. We hypothesized that documented HLA-B\*58:01 testing among allopurinol users will be associated with lower observed burden of severe cutaneous adverse reactions (SCARs) in high-risk populations, and variation in testing practices by race may contribute to differences in adverse outcomes.

#### Methods

TriNetX was used to conduct a retrospective observational study consisting of patients with documented exposure to allopurinol regardless of age or sex, at the time of query.

#### Results

Among patients with allopurinol-associated SCARs, 24.35% were Black, 56.74% were White, and 8.58% were Asian. This is contrasted by allopurinol-treated patients without SCARs, of which 15.08% were Black, 64.65% were White, and 5.52% were Asian. In regards to all allopurinol-treated patients, the proportion experiencing SCARs was higher among Black (0.168%) and Asian (0.161%) patients compared with White patients (0.091%).

Differences were observed in HLA-B\*58:01 testing by race. Among allopurinol-treated patients with documented HLA-B\*58:01 testing, Asian patients comprised 88.21% of those tested, while Black and White patients constituted 3.84% and 3.24% tested, respectively. When looking at patients with documented HLA-B\*58:01 positivity, 91.84% were Asian patients, 6.94% were Black, and no positive tests were observed among White patients.

#### Conclusions

A majority of SCARs cases occur in untested patients, suggesting that a substantial proportion of SCARs occurred in patients without documented HLA-B\*58:01 testing, highlighting a potential opportunity for prevention.

Structural and systemic factors may contribute to these observed disparities in testing practices. These differences may influence real-world implementation of guideline-recommended care.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Prevalence of Strabismus and Amblyopia in Pre-Term Children Screened for Retinopathy of Prematurity (ROP)

### Contributors:

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### Abstract:

Infants with retinopathy of prematurity (ROP) are at increased risk of developing visual sequelae such as strabismus, amblyopia, and cataracts. However, there is limited data on the long-term prevalence of and characterization of risk factors to developing these sequelae, especially within the population not requiring treatment for ROP. This study will help refine follow-up recommendations.

In this study, we used the TriNetX database to build cohorts of patients with ROP ( $\leq 4$  months of birth), untreated or treated or untreated with standard therapies (bevacizumab, photocoagulation), and term-born controls without ROP. We evaluated the development of visual sequelae within these populations by age 6 years and 10 years. We also explored neonatal comorbidities within these populations, including intracranial nontraumatic hemorrhage (INH), necrotizing enterocolitis (NEC), bronchopulmonary dysplasia (BPD), and neonatal sepsis.

Comparing 7,258 children with untreated ROP to 267,276 term-born controls, those with ROP showed markedly higher prevalence of visual sequelae by age 6, including any visual sequelae (9.20% vs 0.90%; RR = 10.24), strabismus (7.12% vs 0.68%; RR = 10.43), amblyopia (4.52% vs 0.40%; RR = 11.29), and cataract (0.39% vs 0.034%; RR = 11.53), all  $p < 0.0001$ . These findings persisted at age 10, with similarly elevated risks across all outcomes (RR range 10.01–11.19). Within the ROP cohort, INH, BPD, NEC were independently associated with increased odds of developing visual sequelae (OR range 1.44–1.73 all  $p < 0.001$ ), while neonatal sepsis showed no significant association (OR 0.85 range 0.68–1.06,  $p=0.38$ ). These findings support the need for early ophthalmologic surveillance and intervention strategies for infants diagnosed with ROP, even if they did not require treatment.

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## Using Functional Near Infrared Spectroscopy to comparison of heart rate variability between females with overactive bladder and healthy controls pre- and post-micturition

### Contributors:

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### Abstract:

**Objectives:** Overactive bladder (OAB) is a chronic condition that significantly impacts daily activities and social functioning. Its pathophysiology is thought to involve dysregulation of autonomic control. Heart rate variability (HRV) is a well-established, validated measure of autonomic nervous system function. This study aimed to determine whether functional near-infrared spectroscopy (fNIRS) detects differences in HRV between females with OAB and healthy controls.

**Methods:** Female participants with OAB and healthy controls underwent a standardized hydration protocol followed by voiding. A 24-channel Brite system collected brain fNIRS data using a sampling rate of 25 Hz. Following band-pass filtering (0.5–2.5 Hz), a MATLAB-based peak detection algorithm was applied to calculate mean R-R intervals (time between consecutive normal cardiac beats) across all channels. For each segment, five channels with lowest mean square difference were identified, and their data were averaged to determine the overall mean R-R value. Voiding and post-void segments were time-matched to each participant's voiding duration. The primary outcome was the difference in mean R-R between voiding and post-void segments.

**Results:** Ten female participants were included: five with OAB and five healthy controls. The OAB group was older ( $53.2 \pm 20.6$  years) compared to controls ( $31.4 \pm 13.9$  years;  $p < 0.05$ ). The change in mean R-R between voiding and post-void phases was significantly smaller in the OAB group ( $0.03 \pm 0.02$  s) than in controls ( $0.11 \pm 0.06$  s;  $p = 0.02$ , Figure 1). Correlation analyses showed no significant association between HRV and age ( $R^2 = 0.15$ ,  $p = 0.27$ ) or BMI ( $R^2 = 0.06$ ,  $p = 0.51$ ).

**Conclusions:** Women with OAB demonstrated reduced HRV following voiding compared with controls, suggesting altered autonomic regulation. Further research is needed to determine whether autonomic dysfunction may serve as a biomarker for diagnosis or treatment.

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## The Impact of Endoscopic Sinus Surgery on 5 Year Cardiovascular Disease Incidence in Patients with Chronic Rhinosinusitis and Obstructive Sleep Apnea

### Contributors:

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### Abstract:

#### Introduction:

Chronic rhinosinusitis (CRS) and obstructive sleep apnea (OSA) are inflammatory conditions linked to increased cardiovascular risk. While functional endoscopic sinus surgery (FESS) improves sinonasal outcomes, its effect on cardiovascular outcomes in patients with comorbid OSA remains unclear. This study evaluates whether FESS is associated with reduced incident cardiovascular disease in this population.

#### Methods:

A retrospective cohort study was performed using the TriNetX Network. Adults aged 18–90 with diagnoses of CRS and OSA were stratified into FESS and FESS-naïve cohorts. 1:1 propensity score matching (PSM) balanced demographic and clinical variables including baseline cardiovascular risk, cardiac medications, and Continuous Positive Airway Pressure (CPAP) use. To mitigate immortal time bias, the index date was the date of surgery in the FESS cohort; for the FESS naïve cohort, a pseudo-index date was assigned using the same lag time from CRS diagnosis to FESS as their PS-matched pairs. Outcomes including atrial fibrillation, hypertension, coronary artery disease, congestive heart failure, pulmonary hypertension, stroke, myocardial infarction, and CPAP use were assessed over five years following a 1-month washout period.

#### Results:

After matching, 6,073 patients comprised each cohort. Compared with the FESS-naïve cohort, FESS patients demonstrated a significantly lower five-year incidence of atrial fibrillation (RR 0.75; 95% CI 0.64–0.89,  $p=0.001$ ), hypertension (RR 0.79; 95% CI 0.71–0.87,  $p<0.001$ ), congestive heart failure (RR 0.87; 95% CI 0.75–0.99,  $p=0.039$ ), pulmonary hypertension (RR 0.76; 95% CI 0.61–0.93,  $p=0.009$ ). There was no significant difference in incidence of stroke, myocardial infarction, coronary artery disease, or CPAP use.

#### Conclusion:

Among patients with CRS and OSA, FESS was associated with reduced risk of chronic, inflammation-mediated cardiovascular conditions but not acute thrombotic events or CPAP use. Further studies are needed to confirm these associations.

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## Efficacy of Inspire™ Hypoglossal Nerve Stimulation in Lowering Supine Apnea-Hypopnea Index

### Contributors:

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### Abstract:

**Background:** Hypoglossal nerve stimulation (HNS) is an effective surgical therapy for obstructive sleep apnea (OSA) in patients who are unable to tolerate continuous positive airway pressure. Since emerging a decade ago, there has been limited evaluation of positional metrics such as supine AHI, despite their clinical relevance. While the Inspire™ device has been the focus of research, recent studies involving the newer Genio™ system reported significant reductions in supine AHI. We aimed to quantify the efficacy of Inspire™ on reducing supine AHI.

**Methods:** We conducted a retrospective review of patients who underwent Inspire™ HNS implantation at a tertiary care center between 2021 and 2024. Pre- and post-operative polysomnogram or home sleep apnea test reports were reviewed to extract total AHI, supine AHI, and total minutes of supine sleep. Patients were included if both studies shared hypopnea desaturation criteria (3% or 4%) and documented at least four hours of total sleep, including a minimum of 55 minutes of supine sleep. One-sided paired t-tests were used to analyze AHI changes.

**Results:** Twenty-five patients (mean age  $59.2 \pm 10.3$  years; mean BMI  $28.6 \pm 2.9$  kg/m<sup>2</sup>) met inclusion criteria. The mean interval between sleep studies was  $420.6 \pm 277.8$  days. One patient met criteria for positional-dependent OSA. Inspire™ HNS significantly reduced supine AHI by  $23.9 \pm 23.4$  events/hour and total AHI by  $22.0 \pm 14.7$  events/hour (both  $p < 0.001$ ). 68% of patients met Sher 20 response criteria, and total supine sleep time was not reduced.

**Conclusion:** Inspire™ HNS provided substantial improvement in supine AHI without reducing supine sleep time, supporting its efficacy in treating positional components of OSA for CPAP-intolerant patients.

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## Methodology: Role of Differential Methylation of Clock and Clock-Controlled Genes in the Colorectal Carcinoma Continuum

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### Abstract:

Background: Global (LINE-1) DNA hypomethylation is an early event in colorectal carcinogenesis that may be regulated by the clock and clock-controlled genes, which have epigenetic and tumor suppressor properties. Aim: The primary research questions are to: 1) identify differentially methylated sites for targeted clock/clock-controlled genes and LINE-1 loci in colorectal tumors and adenomatous polyps relative to adjacent normal tissue; 2) evaluate potential changes in clock/clock-controlled gene or LINE-1 methylation profiles across the colorectal polyp to tumor continuum; 3) determine whether there is a relationship between clock/clock-controlled gene methylation and LINE-1 methylation; and 4) evaluate possible effect modification by age, race and sex. Methods: This study uses global DNA methylation arrays to interrogate DNA extracted from adenoma and colorectal cancer pathology specimens from patients undergoing a surveillance, diagnostic, or screening colonoscopy at VCUHealth between 2019 and 2023. Frequency matching was used to obtain approximately equal distributions of age, race, sex, cancer stage, and polyp type to reduce potential confounding and to ensure balanced subgroup representation, thereby facilitating the identification of novel DNA methylation biomarkers within subgroups. Pathology slide macrodissection and DNA extraction was performed following histological identification of normal and abnormal tissue. Patient sociodemographics, medications, medical history and co-morbidities, lesion pathology, and vital signs were obtained via medical record abstraction within one month of the procedure. Results/Conclusions: The study population includes patients with a pathologically confirmed tubular adenoma, advanced adenoma, sessile serrated adenoma, and adenocarcinoma. In the total population, 40% are aged 45-49 and 60% are  $\geq 50$ , 49% are female, and 51% are African American. Results from methylation arrays and bioinformatics analyses are pending. Understanding the role of clock and clock-controlled gene methylation and its relationship with global DNA methylation in the colorectal polyp to tumor continuum may lead to novel prevention or treatment strategies.

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## Early Pregnancy Loss in Emergency Departments in Virginia: An Investigation on Differing Rates of Active Management In Urban Versus Rural Departments

### Contributors:

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### Abstract:

**Background:** Nearly one fifth of early pregnancy loss (EPL) is encountered in the emergency department (ED) setting. Compared to those who are seen in the clinic, these patients have significantly lower rates of active management of their pregnancy loss, a method that is associated with lower rates of complications compared to expectant management. Within this dynamic, rural EDs have even lower rates of active management compared to urban EDs, however the factors leading to this discrepancy have yet to be explained.

**Methods:** Using the Virginia All Payer Claims Data, we will collect billing data for all ED visits where EPL was addressed between the years of 2020-2023. Locations will then be stratified based on rural and urban settings and will be analyzed using chi squared analysis and z scores on various measures including use of active management (including medication versus procedural), whether OB was consulted during the visit, and rates of complications.

**Potential Impact:** This study aims to identify whether rates of active management of EPL are different in urban versus rural settings in the state of Virginia and to characterize the rates of different types of active management when utilized. It also aims to determine if varying rates of active management could be explained by higher rates of OB consults in an urban setting. This will help identify gaps in ED management of EPL for future initiatives for improvement in EPL care.

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## Same Presentation, Different Diagnosis: A Novel Teaching Approach to Patient Presenting with Non-Sudden Onset Paralysis

### Contributors:

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### Abstract:

**Background:** Non-sudden onset paralysis can be diagnostically challenging due to overlapping clinical features and varied underlying causes, including familial hypokalemic periodic paralysis, Guillain-Barré syndrome (GBS), and botulism. These conditions require distinct diagnostic approaches, yet they often present similarly. Familial hypokalemic periodic paralysis is a channelopathy causing episodic weakness, GBS is an immune-mediated neuropathy leading to ascending paralysis, and botulism results from *Clostridium botulinum* toxin, which inhibits acetylcholine release, causing descending paralysis. Despite their severity, these conditions are rare, limiting learner exposure during clinical rotations. Traditional oral exams, which often feature isolated cases, can encourage diagnostic tunnel vision. To address this gap, we developed a novel educational innovation using three similar oral board-style cases focused on non-sudden onset paralysis, aiming to improve diagnostic reasoning for third- and fourth-year medical students and residents.

**Methods:** We conducted a quasi-experimental study with 18 medical students and residents on neurology and toxicology rotations. Participants completed a pretest assessing baseline knowledge on neurologic localization, differential diagnosis, and management of non-sudden onset paralysis. They then engaged in three sequential oral board-style cases featuring a 24-year-old male with non-sudden onset paralysis. Each case shared the same structure, but subtle differences guided learners toward a diagnosis of GBS, botulism, or familial hypokalemic periodic paralysis. A structured debrief followed, focusing on pathophysiology, distinguishing features, diagnostic testing, and treatment. Participants completed a posttest identical to the pretest. The Wilcoxon signed-rank test was used to analyze score changes.

**Results:** Eighteen students participated; mean pretest and posttest scores were 62.78% (SD 11.03) and 96.11% (SD 6.38), respectively. A Wilcoxon signed-rank test analysis showed statistically significant improvement (test statistic: 171,  $p < 0.0001$ ).

**Conclusion:** This approach significantly improved diagnostic reasoning and medical knowledge, with reproducibility and enhanced clinical reasoning. Limitations include small sample size and time requirements. Future directions include larger-scale implementation and assessment of clinical behavior change.

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## Risk of Open-angle Glaucoma from Carboplatin Use

### Contributors:

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### Abstract:

**Background:** Primary open-angle glaucoma (POAG) is the leading cause of irreversible blindness worldwide. While several systemic medications have been associated with altered glaucoma risk, the impact of chemotherapeutic agents remains poorly understood. Computational drug-repurposing analyses have suggested that carboplatin, a platinum-based alkylating agent widely used in solid malignancies, may interact with trabecular meshwork pathways implicated in POAG. However, case reports describing ocular toxicity raise concern for potential harm. No large-scale epidemiologic studies have evaluated this association.

**Methods:** We conducted a retrospective cohort study using the TriNetX Research Network, comprising over 180 million patients' electronic health records. Individuals with documented carboplatin exposure were propensity score-matched 1:1 to unexposed controls, excluding patients with prior glaucoma, ocular hypertension (OHTN), or glaucoma medication use. The primary outcome was incident POAG; secondary outcomes included all-cause glaucoma, OHTN, and antiglaucoma medication use at 2-, 5-, and 10-year intervals. Risk ratios (RRs) and hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated, with Cox proportional hazards modeling and sensitivity analyses restricted to Caucasian-only and non-diabetic cohorts.

**Results:** Carboplatin exposure was associated with significantly increased risk of POAG at 2 years (RR 2.20, 95% CI 1.05–4.62), 5 years (RR 3.30, 95% CI 1.64–6.66), and 10 years (RR 3.90, 95% CI 1.76–8.65). Similar elevations were observed for all-cause glaucoma, OHTN, and glaucoma medication initiation. Survival analyses showed a largely reduced glaucoma-free survival in carboplatin-exposed patients, with early divergence in cumulative incidence curves that widened over time. Findings were consistent across sensitivity analyses.

**Conclusions:** In this large real-world cohort, carboplatin use was associated with a two- to four-fold increased risk of POAG and related outcomes. These findings contrast prior computational predictions of benefit and instead suggest possible ocular toxicity, highlighting the need for prospective validation and consideration of ophthalmologic monitoring in exposed patients.

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## Type 2 Diabetes Mellitus And Alcohol Use Disorder Amplify Both Cardio-Renal-Metabolic And Liver Related Outcomes and Mortality Risk Compared to Either Disorder Alone

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### Abstract:

Alcohol use disorder (AUD) and type 2 diabetes mellitus (T2DM) are both highly prevalent and often coexist in the same person. The impact of T2DM on AUD-related liver outcomes, and the impact of AUD on cardio-renal-metabolic (CRM) outcomes, is not well established. The study aimed to quantify the impact of concomitant T2DM and AUD on CRM and liver outcomes relative to either disorder alone. We evaluated mortality, CRM, and liver outcomes in those with T2DM + AUD, propensity score-matched (PSM) controls with T2DM or AUD alone. PSM was done for demographics, BMI, laboratory (bilirubin, AST, ALT, INR, creatinine, A1C), nicotine dependence, and statin use. Independent analyses by age decile strata from 30 yrs onwards were performed, and key outcome measures included death, new diagnosis of cirrhosis, ascites, hepatic encephalopathy, alcohol-associated hepatitis, MACE, atrial fibrillation, and obesity-related cancers. Absolute risk (AR%) and Hazard ratios (HR) were computed, and Kaplan-Meier analyses were performed. 131900, 639437, and 2420891 cases of T2DM+AUD, AUD alone, and T2DM alone were eligible for analysis before PSM. T2DM+AUD vs T2DM: In T2DM, coexistent AUD increased mortality (AR 2.2-6.1, HR 1.3-1.6), ascites (HR 2.7-3.3), encephalopathy (HR 6.9-7.9), MACE (HR 1.4-2.0), atrial fibrillation (HR 1.4-1.8) and sepsis (HR 1.7-2.0) ( $p < 0.001$ ) across all age deciles studied. Cancer risk (HR 1.3, 95% CI 1.2-1.4) was increased in those with age  $> 60$  yrs. T2DM+AUD vs AUD: T2DM increased the risk of death (HR 1.4-1.6), new diagnosis of cirrhosis (HR 1.5-1.8), and heart failure (HR 2-3) ( $p < 0.001$ ) for all age deciles. Importantly, the risk of alcohol-associated hepatitis was increased in ages 30-59 yrs (HR: 1.1-1.5) ( $p < 0.05$ ). T2DM increases liver-related outcomes, including the development of alcohol-associated hepatitis in those with AUD. AUD increases liver-related outcomes in those with T2DM. T2DM +AUD increased mortality and CRM outcomes compared to either one alone.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Electronic Health Record Evidence Suggests Underrecognition and Low Antifibrotic Use in Progressive Fibrosing Interstitial Lung Disease

### Contributors:

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### Abstract:

**Background:** Progressive fibrosing interstitial lung disease (PF-ILD) comprises non-IPF fibrotic ILDs with progressive fibrosis and poor prognosis similar to IPF. Antifibrotic (AF) therapies slow disease progression, yet real-world PF-ILD prevalence estimates vary widely, suggesting diagnostic complexity and potential underrecognition.

**Methods:** We conducted a retrospective cohort study using the TriNetX U.S. Collaborative Network (2021–2024). Coded PF-ILD was defined by J84.170 excluding IPF. Three proxy PF-ILD cohorts (sensitive, specific, strict) were adapted from published algorithms using non-IPF ILD diagnoses plus progression criteria. We compared prevalence, AF uptake, demographics, ILD subtypes, and clinical outcomes. Proxy performance versus coded PF-ILD was assessed using sensitivity, specificity,  $\kappa$ , Youden's J, and prevalence-adjusted bias-adjusted  $\kappa$  (PABAK). Odds ratios (ORs) and hazard ratios (HRs) were calculated for AF use, respiratory failure, lung transplant, and mortality. IPF served as a clinical benchmark.

**Results:** Among 57,193,009 adults, PF-ILD prevalence was 3.7 per 100,000 for coded cases versus 250 (sensitive), 124 (specific), and 32 (strict) for proxy cohorts. AF use was higher in coded PF-ILD (18.3%) than proxies (3.2–8.6%) but lower than IPF (28.5%). Demographics and ILD subtype distributions were similar between coded and proxy groups (most SMDs <0.10). Outcomes were comparable between coded and proxy cohorts, while coded patients had higher mortality and respiratory failure than IPF. Proxy specificity ranged 63–95% with high negative predictive value (~99%).  $\kappa$  was low (0.01–0.04) but PABAK (0.26–0.90) and Youden's J (0.13–0.24) were higher.

**Conclusions:** Proxy-defined PF-ILD cohorts were substantially larger yet clinically similar to coded cases, suggesting under-coding and undertreatment. Coding may occur late in disease or be used selectively to enable treatment. EHR-based proxy algorithms may help identify an “invisible” PF-ILD population for earlier recognition and intervention, though prospective adjudication is needed.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Understanding Human Trafficking and Its Clinical Relevance: Integration into the M2 Physician, Patient, and Society Longitudinal Course

### Contributors:

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Meera Pahuja, MD, VCU Department of Internal Medicine

### Abstract:

#### Purpose/Background:

Human trafficking (HT) involves the use of force, fraud, or coercion for labor or commercial sex and has been reported in all 50 states and U.S. territories. Although its true prevalence is difficult to quantify, studies estimate that 68–88% of trafficked persons encounter a healthcare professional during exploitation, positioning physicians as critical points of identification and intervention. Despite this, no formal HT education previously existed within the pre-clinical curriculum. To address this gap, a required two-hour HT lecture was introduced during the second year of medical school, prior to students' transition into clinical settings. The session aimed to provide foundational knowledge, emphasize trauma-informed and survivor-centered care, and build confidence in recognizing and responding to trafficking in clinical practice.

#### Methods:

The session consisted of three components. First, fourth-year medical students delivered a peer-led introduction defining HT and key clinical terminology, concluding with a survivor video to contextualize the material. Second, a live conversation with a survivor-advocate highlighted the long-term physical and psychological impact of trafficking. Third, a VCU OB-GYN shared her experience identifying a trafficked patient and testifying in court, emphasizing clinical intuition, recognition of subtle warning signs, and thorough documentation. Students completed a reflective “brain dump” exercise to reinforce learning.

#### Results:

Analysis of reflections revealed several themes. Students expressed surprise at HT's prevalence, particularly within their own communities. While sex trafficking was familiar, labor trafficking was less recognized. Learners gained insight into the psychological coercion that binds victims to traffickers and emphasized that physicians are not “rescuers,” but providers of compassionate, nonjudgmental care. Students recognized that trust-building over time is essential to supporting disclosure and patient agency.

#### Conclusion:

This session successfully introduced HT as a critical public health issue and underscored the physician's role in identification and trauma-informed care. Future work will evaluate longitudinal exposure and its impact on student confidence and preparedness.

# Poster Presentation

Round 1 (11 AM - 12 PM)

49

## **Prefrontal Cortex Functional Near Infrared Spectroscopy (fNIRS) provides preliminary detection of neuroexcitation Sacral Neuromodulation Programming Characteristics**

### **Contributors:**

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### **Abstract:**

**Objectives:** Sacral neuromodulation (SNM) proposed neuropathway and treatment mechanism involves the prefrontal cortex (PFC). The objective of this study was to determine if specific PFC neuroexcitation patterns induced by acute SNM programming changes could be detected with non-invasive functional near infrared spectroscopy (fNIRS) during natural bladder filling.

**Methods:** Female patients with SNM (>6 months) for OAB were recruited. A 24-channel fNIRS device continuously recorded PFC O2Hb during a hydration protocol. The (4-7) preset SNM programs, based on device, were trialed at sensory threshold for 3 minutes, first, with an empty bladder, and then after “first sensation to void.” Using an anatomic map, participants reported stimulation sensation. Sensation mapping identified peak perineal sensation as a method to rank programs from best to worst. fNIRS segments underwent motion correction and low pass filtering. The primary outcome, fNIRS comparisons (mean difference O2Hb), were performed between last 10% (18sec) and first 10% of each 3-minute programming segment.

**Results:** 50 program adjustments were completed in 4 female participants (mean age:  $62.7 \pm 18.8$  years and mean BMI:  $28.8 \pm 5.1$ ). Programs rated best and worst differed by patient. With an empty bladder, in 21/24(88%) fNIRS channels, O2Hb mean difference was higher in the best program compared to the worst program, indicating greater PFC neuroexcitation. With a filling bladder (after first sensation), in 22/24(92%) fNIRS channels O2Hb mean difference was lower in the best program compared to the worst program, indicating reduced PFC neuroexcitation associated with increased filling sensation.

**Conclusions:** fNIRS of the PFC detected O2Hb changes during acute SNM program adjustments that differed between empty bladder and increased bladder filling. These changes suggest that SNM may differentially affect PFC control of urinary sensation/urgency. Future confirmatory studies are needed, but this study shows that fNIRS may serve as a tool to optimize SNM programming.

# Poster Presentation

Round 1 (11 AM - 12 PM)

50

## Analysis of Breastfeeding Rates at Discharge Among Integrated OBGYN-Addiction Care Program Patients

### Contributors:

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### Abstract:

**Intro/Objectives:** Among pregnant people, substance use disorders (SUD) are common. Despite benefits like reduced infections and stronger maternal-infant bonding, breastfeeding rates at hospital discharge remain low for women with SUD. This study describes breastfeeding rates among women with SUD in regards to psychiatric and SUD comorbidities and lactation consultation receipt.

**Methods:** This secondary analysis reviewed retrospective medical records of pregnant and postpartum patients with SUD at an integrated OBGYN-Addiction clinic who consented to be part of a research registry (year1-Y2). Infant records provided discharge breastfeeding status; maternal records provided psychiatric and SUD co-morbidities. Chi-square tests assessed breastfeeding status differences by maternal variables, including documented psychiatric diagnosis, multiple SUD diagnoses, and lactation consultation receipt.

**Results:** Participants (n=48, mean age 30.7, 62.5% White, 33.3% Black) had a 58.3% breastfeeding rate at infant discharge. Breastfeeding rates did not differ significantly by race ( $\chi^2 = 4.41$ ,  $p = .249$ ). Nearly all participants (98.5%) had comorbid psychiatric conditions, with no significant breastfeeding rate differences based on psychiatric comorbidity ( $\chi^2 = 0.060$ ,  $p = .807$ ) or having one versus multiple SUD diagnoses ( $\chi^2 = 0.378$ ,  $p = .539$ ). The majority of patients did not receive a lactation consult (56.3.6%) and there were no significant differences in rates of breastfeeding between participants who did and did not receive lactation consultation ( $\chi^2 = .196$ ,  $p = .658$ ).

**Conclusions:** This population's complex needs highlight the value of comprehensive, multi-disciplinary care models in supporting health outcomes for SUD-impacted maternal-infant dyads. Larger studies are warranted to examine breastfeeding patterns and correlates among women with SUD, informing the future development of tailored lactation consultation services.

**Learning Objective:** Better understand lactation rates among individuals in relation to SUD, psychiatric comorbidity, and lactation consultation

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Risk Factors for Progression to Invasive Candida Auris Infection among Colonized Patients

### Contributors:

Sonia Srikanth, VCU School of Medicine  
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### Abstract:

Identified risk factors for Candida auris infection are generally markers of disease severity and/or medical vulnerability. A regional C. auris outbreak in 2022 led to extensive admission and point-prevalence testing in tertiary care hospital. We retrospectively reviewed charts to identify novel risk factors for progression from colonization to infection in a universally medically complex population.

A case-control study was performed to compare patients developing invasive infection (cases) from those remaining colonization. Inclusion criteria were patients newly identified to be colonized with C. auris during a hospital admission from 1/2023 through 5/2025. Patients diagnosed with clinical infection as their first evidence of colonization were excluded.

Risk factor variables included ICU status, other drug resistant organisms (MDROs), length of stay (LOS), time to colonization (days from admission to identification of C. auris), antimicrobial coverage with broadly acting agents, operative and other procedures, type/number of devices. Factors were compared between cases and controls using Fisher's Exact Tests for categorical variables and Mann-Whitney U Tests for continuous variables using SAS 9.4.

During the study, 74 patients became colonized and 17 went on to develop invasive infection. The following were associated with infection: colonization with other MDROs, tracheostomy, liver failure, dialysis (though not renal failure), transplant w/in last year (driven by liver, N=7), number of drains at colonization (table 1). Several factors associated with severity of illness (ICU status, antibiotic pressure) were not associated with progression to infection in this cohort.

In a medically complex population, several risk factors associated with illness severity were not associated with progression from C. auris colonization to infection, whereas liver disease and transplantation, along with other MDROs, tracheostomy, and number of drains were. Targeted interventions attempting to decolonize tracheostomy or drain sites, and/or liver disease patients may help prioritize infection prevention.

# Poster Presentation

Round 1 (11 AM - 12 PM)

52

## Supraorbital Keyhole Craniotomy as an Approach to the Olfactory Tract

### Contributors:

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Aaron Tucker, VCU Health Department of Otolaryngology  
Daniel Coelho, MD, VCU Health Department of Otolaryngology

### Abstract:

**Objectives:** The goal of this study was to determine the best approach to the olfactory tract for implantation of an olfactory electrical stimulator to treat anosmia.

**Methods:** This retrospective cohort study (n=50) at VCU Medical Center between 7/2025 and 10/2025 used CT imaging and a software called syngo.via to assess whether there was a clear path from points on the exterior skull to the anterior or posterior olfactory tract. Five points on the exterior skull were used based on the supraorbital keyhole craniotomy. The points were as follows: the supraorbital notch (1), 2 cm superior to the supraorbital notch (2), superior temporal line by the orbital rim (3), 2 cm superior to the third point (4), the determined center of all the previous points (5). For each point, a trajectory was made to anterior (A) and posterior (B) olfactory tract on each side. The anterior olfactory tract was found at the culmination of the crista galli. The posterior olfactory tract was measured at the anterior edge of the pituitary fossa.

**Results:** There was a 100% success rate of at least one route without obstructions (sinus, orbital bone, orbit, other) per subject. The best route, which 98% of patients had an unobstructed route, was point 4B. The posterior olfactory tract was more often unobstructed than the anterior (p value = 0.000). There were no statistically significant differences between approaches based on age, sex or BMI. The most common obstruction was the orbital bone. The average olfactory tract length was 28.434 mm on the left and 28.316 mm on the right.

**Conclusion:** The study demonstrates that the supraorbital keyhole craniotomy could be an effective approach for an olfactory implant. All patients had at least one route that had an unobstructed view of either the anterior or posterior olfactory tract.

# Poster Presentation

Round 1 (11 AM - 12 PM)

53

## Single Authorship Trends in High-Impact Otolaryngology Journals: A Bibliometric Analysis

### Contributors:

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### Abstract:

**Objectives:** As the quality of evidence-based research continues to evolve, authorship trends would be expected to change in parallel. The goal of this study is to explore trends in authorship within the field of otolaryngology using papers written by a single author.

**Methods:** The Web of Science database was queried for studies published in first-quartile impact factor otolaryngology journals between 1994-2024. Single-author publications were identified via manual coding. The studies were analyzed by publication type, country of origin, open access status, and five-year total citation accrual. Results were compared between studies published in each decade, including 1994-2003 (D1), 2004-2013 (D2), and 2014-2023 (D3).

**Results:** Out of 62,897 identified total publications in the study period, 4,322 (6.87%) were single-author studies. The rate of single authorship significantly decrease in each decade (D1: 12.5%, D2: 6.6%, D3: 4.7%,  $p < 0.00001$ ).

- In 1999, 8.03% of publications were single author
- In 2009, 6.4% of publications were single author.
- In 2019, 4.96% of publications were single author.
- This matches the overall trend of the decades.

The proportion of single author studies categorized as “articles” in the Web of Science also decreased from 1999 (3.7%) to 2009 (2.69%) and 2019 (1.1%,  $p < 0.00001$ ). Five-year citation accrual of single-author articles increased throughout the study period (1999: 3.69 citations per article, 2009: 6.36 citations per article, 2019: 16.23 citations per article). Five-year citation accrual of multi-author articles is 7.01 citations per article for 1999, 9.89 citations per article for 2009, and 14.54 citations per article for 2019. Open access distinction for single author articles increased over the study period (1999: 1/35, 2009: 6/41, 2019: 9/28). The USA had a majority of single author articles during the study period.

**Conclusion:** Single-author articles in high-impact otolaryngology journals steadily decreased over the last three decades. When looking at representative years in each decade, citations per article increased across the study period even in proportion to the increase in multi author citations per article. These findings suggests the importance of single authorship in producing impactful papers in the field of otorhinolaryngology and raises concerns with shifting to multi author publications.

# Poster Presentation

Round 1 (11 AM - 12 PM)

54

## To Investigate Dickkopf1 (DKK1)'s Novel Receptor in Inflammation

### Contributors:

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### Abstract:

Dickkopf-1 (DKK1) is a Wnt signaling antagonist associated with regulation of cell proliferation and differentiation but has recently been implicated in inflammatory lung diseases such as fibrosis, respiratory infection, and asthma. Despite increasing evidence of its immunomodulatory role, the cellular sources of DKK1 within the lung and the receptor mechanisms driving its pro-inflammatory effects remain inconclusive. Newer data suggests that platelets and lung-resident megakaryocytes may represent important sources of DKK1, while prior studies indicate that low-density lipoprotein receptor-related protein 6 (LRP6) does not fully explain DKK1-mediated inflammatory signaling, raising the possibility of Toll-like receptor 4 (TLR4) involvement. This project evaluated potential DKK1-TLR4 binding based on our preliminary data. To analyze receptor interactions, site-directed mutagenesis of candidate amino acid residues in human TLR4 was performed, based on computer-aided modeling of DKK1-TLR4 interaction. Mutant and wild-type human TLR4 constructs were over expressed in HEK (Human Embryonic Kidney) 293 cells along with MD2 and CD14, to ensure the necessity of these receptor complex proteins. Expression of TLR4 constructs was confirmed by Western blot analysis, and NF- $\kappa$ B luciferase reporter assays were used to evaluate DKK1-mediated inflammatory signaling. As a positive control, we used LPS. Of the two hypothesized models, we found that model A is preferred to model B by NF- $\kappa$ B luciferase reporter assays. These findings provided a novel insight into a potential DKK1-TLR4 inflammatory link. We conclude that DKK1 and LPS may share a binding site. However, given that DKK1 is an endogenous ligand, we conclude that DKK1-TLR4 interaction is critical for sterile inflammation.

# Poster Presentation

Round 1 (11 AM - 12 PM)

55

## Identifying Heterogeneity in Mental Health Burden Across Southeast Asian American Subgroups: A TriNetX Study

### Contributors:

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### Abstract:

**Background:** Southeast Asian subgroups are a rapidly growing population in the United States, yet are commonly treated as a monolithic group in health research without distinct subgroup-level analysis. These communities -- including Vietnamese, Filipino, Cambodian, Laotian, Burmese, and Hmong Americans -- have distinct migration histories, trauma exposures, and sociocultural contexts that may influence vulnerability to mental health disorders. Although prior studies suggest variation in psychiatric prevalence across subgroups, comprehensive comparative data remain limited. We evaluated whether disaggregated analyses reveal distinct patterns of mental health diagnoses that are obscured in aggregated Asian data.

**Methods:** We conducted a retrospective cross-sectional study using the TriNetX federated electronic health record network. Mental health diagnoses were identified using ICD-10 codes. Southeast Asian subgroup classification was defined by primary language preference, recorded according to ISO language codes, in combination with Asian race. Adjusted risk ratios (RRs) were calculated comparing subgroup prevalence with the aggregated Asian reference population.

**Results:** Compared with the aggregated Asian reference group, several Southeast Asian subgroups demonstrated elevated mental health risk. Four of seven subgroups with available data (Filipino, Burmese, Cambodian, and Laotian) showed significantly increased risk of depression (RR 1.35–2.43), with Laotians exhibiting the highest risk (RR 2.43, 95% CI 1.29–4.59). Vietnamese individuals demonstrated significantly increased anxiety risk (RR 1.61, 95% CI 1.28–2.02). Although not all findings reached statistical significance, all subgroup estimates trended above 1.00. Data were unavailable for Malaysian and Indonesian participants due to limited sample size.

**Conclusions:** Disaggregating Southeast Asian American health data revealed clinically meaningful heterogeneity in mental health burden that is obscured in aggregated Asian analyses. These findings may inform targeted interventions, future research, and more equitable mental healthcare delivery.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Interventional Radiology in Sickle Cell Disease: Expanding the Toolkit for Acute Management

### Contributors:

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### Abstract:

#### Background:

Sickle Cell Disease (SCD) is a condition where red blood cells become sickle-shaped due to a mutation in the  $\beta$ -globin gene, blocking blood vessels and reducing systemic oxygen delivery {1}. Traditionally, SCD is managed with hydroxyurea or chronic transfusion therapy, and treated long-term with hematopoietic stem cell transplant {2}. While uncommon, minimally invasive image-guided treatment approaches may prove beneficial in certain acute instances of SCD {3}. These interventions include splenic artery embolization for sequestration crises {4}, central venous access for exchange transfusion {2,5}, and penile artery embolization for free-flow priapism {6–8}. Splenic artery embolization involves delivering embolic agents through a catheter to occlude vessels in the treatment of splenic sequestration crisis when splenectomy is contraindicated {4}. Central venous access for exchange transfusion involves delivering blood products through a central vein (i.e. internal jugular, femoral, subclavian veins) under ultrasound guidance. Transcatheter embolization is used to treat free-flow priapism in SCD patients caused by arterial-cavernosal fistula, offering a minimally invasive alternative to surgery that lowers risks of erectile dysfunction {6–8}.

#### Methods:

Comprehensive literature search was performed on recent radiological interventions and clinical manifestations of SCD including sequestration crises {4}, free-flow priapism {6-8}, and transfusion venous access {2,5}.

#### Clinical findings/Results:

Rescue splenic artery embolization has shown success in a patient with acute splenic sequestration crisis, providing a safer alternative to splenectomy {4}. Central venous access has been shown to provide venous access in acute settings where peripheral access is unfeasible, allowing high-flow access needed for blood transfusion while minimizing iron overload {2,5}. Transcatheter embolization of the penile arteries has shown success in treating SCD patients in cases of both traumatic and atraumatic high-flow priapism {7,8}.

#### Conclusion:

Understanding the indications for interventional radiological procedures may allow clinicians to better treat manifestations of SCD and improve patient outcomes compared to first line treatments {1}.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## Cumulative Systemic Steroid Exposure and Adverse Outcomes in Chronic Rhinosinusitis: Evidence for a Threshold Effect

### Contributors:

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### Abstract:

#### Objectives

To identify the risk of multiple steroid courses with steroid-related complications (SRC) in patients with chronic rhinosinusitis with nasal polyposis (CRSwNP).

#### Methods

TriNetX was queried for adults with CRSwNP with no pre-existing autoimmune diseases, pulmonary diseases or diabetes mellitus. Steroid exposure was limited to within 2 years of diagnosis. Patients were grouped by number of courses and propensity score-matched for demographics and clinical covariates. Incidence of SRC from 1 month to 2 years post-prescription included: skeletal (osteoporosis and pathological fracture), gastrointestinal (ulcer), psychiatric, endocrine, infection (UTI and candidiasis).

#### Results

After matching, cohorts 1 and 2 both included 1,642 patients. 1 course was associated with lower SRC (RR = 0.81, 95% CI [0.69, 0.93]), lower rates of metabolic disorders (RR = 0.57 [0.33, 0.97]), lower infection rates (RR = 0.42 [0.28, 0.63]) compared to 2 courses. 598 patients were included in the matched 2 vs. 3 cohorts. Similar SRC rates were seen in the 2 vs. 3 course analysis (RR = 1.01 [0.81, 1.26]). 517 patients were included in the matched 3 vs. 4-6 cohorts. SRC risk was higher in patients receiving 4-6 courses compared to 3 courses (RR = 0.79 [0.63, 0.99]). Patients receiving 3 courses had lower infection rates (RR = 0.42 [0.25, 0.71]) compared to 4-6.

#### Conclusion

In patients with CRSwNP, cumulative steroid exposure is associated with increased SRC risk. Two or more courses within 2 years may represent a threshold for elevated risk.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## **A Phase 1 Trial to Evaluate the Safety, Pharmacokinetics and Anti-tumor Activity of ATYR2810, an NRP2 Monoclonal Antibody, Alone and in Combination with Docetaxel in Patients with Advanced Malignancies.**

### **Contributors:**

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### **Abstract:**

Neuropilins (NRPs) are transmembrane proteins involved in vascular and nervous system

development by regulating angiogenesis and axon guiding cues. Increased levels of neuropilin-2 (NRP2), specifically, in tumor cells is associated with poor prognosis and cancer progression of several cancers, including prostate cancer. Expression of NRP2 was detected in tumor cells and tumor-associated endothelial and immune cells (dendritic, macrophages and CD4/CD8+ T-cells) and promoted cancer cell survival, lymphangiogenesis and immune suppression important for cancer progression. Prior studies on monoclonal antibodies to neuropilin-2 in vitro and in vivo showed inhibition of metastatic progression, immune modulation and formation of functional lymphatics. ATYR2810 is a fully humanized monoclonal antibody that is designed to specifically and functionally block the interaction between NRP2 and one of its primary ligands, VEGF-C. This clinical trial initial phase will collect data on adverse events among adults (age  $\geq 18$  years) with metastatic solid malignancies who progressed on standard of care first line chemotherapy. Recruitment is expected to take 12-18 months, with extended follow-up and all study activities continuing for up to 3 years. Pretreatment biopsy will be done to confirm neuropilin-2 status prior to enrollment into study. Data collected will include adverse events; daily for the first week after the infusion, weekly for the second and third week. Completion of this project will form the basis for a future prospective study with prostate cancer patients, which will test the ability of this panel of secretory proteins as biomarker for aggressive disease. Further, these proteins can be useful as pharmacodynamic markers for neuropilin-2 targeting therapies.

# Poster Presentation

Round 1 (11 AM - 12 PM)

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## **Renal Insufficiency and Parkinson's Disease (PD): A retrospective chart review on factors that impact development of PD in veterans with impaired kidney function**

### **Contributors:**

Sydney Williams, M3, Virginia Commonwealth University

### **Abstract:**

**Background:** A higher incidence of the common neurodegenerative disorder, Parkinson's Disease, is well documented in patients with chronic kidney disease (CKD). Current studies are exploring the connection between these two disease states; however, there is limited data regarding what clinical factors may contribute to this relationship. Researchers postulate that alpha-synuclein initially deposits in the gastrointestinal tract and renal system prior to migrating towards its final destination, the brain. One cohort study revealed that certain subgroups had a higher probability of PD development: residents in rural areas, patients with normal body mass indices (BMIs), and those with fasting glucose greater than 100 mg/dL. There is little data regarding other medical and social factors that may influence Parkinson's Disease development in this patient population. Our study aims to further elucidate the relationship between the two.

**Methods:** The study is a large-scale, retrospective chart review. The sample population consists of patients receiving care in the VA's Parkinson's Disease Research, Education, and Clinical Center's (PADRECC) interdisciplinary team clinic over the past five years. The following variables are being explored: kidney function markers (i.e. UA, Cr, UPCR/UACR, vitamin D), hypertension labs, brain imaging, hormone levels (i.e. testosterone), and social drivers of health.

**Evaluation Plan:** Many of the lab values are currently being pulled from the VA's Clinical Case Registry (CCR) site and placed into a centralized REDCap database. Our team is working to complete the chart review gathering patient's diagnosis information and social situation by the end of the month. The research team hopes that the CCR data will also be completed by the first week of March. Trends in the data will direct the method of statistical analysis.

**Potential Impact:** Our study aims to identify modifiable risk factors for PD diagnosis and progression in patients with renal insufficiency in hopes of establishing appropriate preventative measures.

# Poster Presentation

Round 1 (11 AM - 12 PM)

60

## Dual Inhibition of PDE5-mTOR Potentiates Chemo-and Immunotherapy of Breast Cancer while Attenuating its Cardiotoxicity

### Contributors:

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### Abstract:

**Background:** Combining HER2-targeted immunotherapy with chemotherapy (Doxorubicin, DOX) improves progression-free survival in HER2-positive breast cancer. However, cardiotoxicity remains an undesirable consequence. We investigated whether co-treatment of Sildenafil (Sild, phosphodiesterase 5 inhibitor) and Rapamycin (Rapa, mammalian target of rapamycin inhibitor) could attenuate cardiotoxicity associated with DOX±HER2 inhibitor, while still potentiating its anticancer efficacy in breast cancer.

**Methods:** Female C57BL/6J mice were treated with DOX for 2 weeks. After 4 weeks, Afatinib (AFA, inhibitor of HER2 and EGFR) for another 2 weeks. Rapa and Sild were administered for 12 weeks starting 1 week before the first DOX treatment. Cardiac function was monitored by echocardiography, then the hearts were collected for Western blot analysis. In vitro, SKBr3 cells (HER2+ breast cancer cells) were treated with DOX (1µM), and/or AG-825 (HER2 inhibitor, 5µM), with/without Sild (10 µM) + Rapa (100 nM) for 24-72 hours. Cell death and viability were evaluated with Trypan blue staining and MTS assay. Western Blots were conducted to evaluate protein expression profiles in SKBr3.

**Results:** DOX±AFA reduced body weight and survival of mice along with a reduction in cardiac function (left ventricular ejection fraction, LVEF), which were improved with co-treatment of Sild+Rapa. Sild+Rapa co-treatment enhanced the cytotoxic effects of DOX+AG-825 in SKBr3 cells. The phosphorylation of mTOR and S6 (marker of mTOR complex 1) were markedly reduced by co-treatment of Sild+Rapa with DOX±AFA in both mice hearts and SKBr3 cells. Interestingly, a proapoptotic marker, Bax, was induced in mice hearts after DOX+AFA treatment, while Sild+Rapa co-treatment repressed it.

**Conclusion:** Cotreatment with Sild+Rapa may represent a novel strategy to reduce cardiotoxicity associated with chemoimmunotherapy, while repressing breast cancer.

# Poster Presentation

Round 1 (11 AM - 12 PM)

61

## Systemic Comorbidities in Patients with Pseudoexfoliation Glaucoma and Primary Open-Angle Glaucoma: A TriNetX Analysis

### Contributors:

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### Abstract:

**Objective:** To compare the cardiovascular, neurologic, and psychiatric comorbidity burdens between patients with pseudoexfoliation glaucoma (PXG) and patients with primary open-angle glaucoma (POAG).

**Design:** Retrospective cohort study.

**Subjects:** Patients with diagnosis codes for PXG and POAG between January 1, 2000 and December 31, 2024 in TriNetX.

**Methods:** PXG and POAG cohorts were identified using ICD-10 codes within the TriNetX US Collaborative Network and balanced using propensity score matching on demographic and clinical covariates. The analytic tools within the platform were used to determine the prevalence of comorbidities including chronic ischemic heart disease, heart valve abnormalities, essential hypertension, aortic aneurysm, type 2 diabetes mellitus, sensorineural hearing loss, Alzheimer's disease, anxiety and depression in each of the cohorts. Finally, risk ratios and Kaplan-Meier probabilities were generated.

**Results:** After propensity score matching, 8,410 patients per cohort remained for the cardiovascular analysis and 9,229 per cohort for the neurologic/psychiatric analysis. PXG was associated with higher prevalence of aortic aneurysm, chronic ischemic heart disease, valvular heart disease, essential hypertension, depression, anxiety, sensorineural hearing loss and mortality. The strongest associations were observed for valvular heart disease (RR 1.300, 95% CI 1.199–1.409), sensorineural hearing loss (RR 1.286, 95% CI 1.180–1.401), anxiety (RR 1.238, 95% CI 1.155–1.326), and mortality (analysis A: RR 1.297, 95% CI 1.182–1.423; analysis B: RR 1.319, 95% CI 1.204–1.499).

**Conclusion:** Patients with PXG exhibit higher rates of chronic ischemic heart disease, heart valve abnormalities, essential hypertension, mortality, sensorineural hearing loss, depression, and anxiety compared to those with POAG. Patients with POAG exhibited higher rates of type 2 diabetes mellitus compared to PXG. Although PXG was associated with higher prevalence of multiple systemic comorbidities, survival differences were limited and generally small.

# Poster Presentation

Round 1 (11 AM - 12 PM)

62

## Real-World Evaluation of Cardiac Outcomes After CAR-T in Patients with Hematologic Malignancies

### Contributors:

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### Abstract:

**Background/Rationale:** CAR-T cell therapy has transformed the treatment of relapsed or refractory hematologic malignancies, offering durable remissions where few options previously existed. However, cardiac complications, including acute coronary syndromes (ACS), heart failure (HF), and arrhythmias, have emerged as important safety concerns. Prior studies are largely single-center, disease- or product-specific, and restricted to acute post-infusion events, leaving time-dependent patterns and long-term cardiovascular risk poorly characterized. Identifying when cardiac risk is highest and which patients are most vulnerable, is essential for optimizing survivorship care.

**Methods:** Using TriNetX, a global federated network of de-identified EHR data from 42 healthcare systems, we conducted a retrospective cohort study of 4,972 adults with Non-Hodgkin Lymphoma, Multiple Myeloma, or Acute Lymphoblastic Leukemia who received FDA-approved CAR-T therapy. Cardiac events were assessed beyond the first 14 days post-infusion to minimize acute inflammatory confounding. Propensity score matching balanced cohorts by age, sex, comorbidities, BMI, and prior therapy. Cox proportional hazards regression generated hazard ratios (HR) with 95% confidence intervals across prespecified time windows: days 30, 100, 180, 365, and beyond 365.

**Results:** Cumulative incidence was 2.54% for ACS, 7.42% for HF, and 9.77% for arrhythmias. Arrhythmias peaked earliest (3.49% within 30 days), while ACS (0.69%) and HF (6.64%) were highest between days 30 to 100. Risk was lowest between days 100 to 180, with late events persisting beyond one year. Age 65 or older was associated with increased HF (HR 1.50) and arrhythmia risk (HR 1.36). Male sex (HR 1.49) and anti-CD19 therapy (HR 1.42) were independently associated with higher arrhythmia risk.

**Conclusions/Impact:** Cardiac events after CAR-T follow distinct time-dependent patterns, with the highest-risk window occurring within the first 100 days. These findings support targeted cardiovascular monitoring protocols, particularly for older patients and those receiving anti-CD19 products, and underscore the need for cardio-oncology integration in post-CAR-T survivorship care.



## ROUND 2 ABSTRACTS

# Poster Presentation

Round Two (2 PM - 3 PM)

1

## Predictors of Depression after Pediatric Spinal Cord Injury: A Nationwide Analysis

### Contributors:

Ruhika Aguru, M2, Virginia Commonwealth University  
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### Abstract:

**Background/Objectives:** Pediatric spinal cord injury is a rare but debilitating pathology which presents with significant long-term physical, psychosocial and developmental challenges, including depression. This study sought to estimate the incidence of depressive episodes in pediatric patients with cervical and thoracic spinal cord injury and to identify demographic and clinical predictors of post-injury depression.

**Methods:** A retrospective cohort study was conducted using the TriNetX Research Network, including pediatric patients (<18 years) with cervical and thoracic spinal cord injury. Incidence of the ICD-10 F.32 depressive episode code after spinal cord injury was assessed using analyses within the TriNetX platform, excluding patients with prior history of depression. Risk ratios, odds ratios, and depressive episode frequency were reported and a Cox proportional hazards model was used to evaluate predictors of depressive episodes post-injury, including those with a prior history of depression. Adverse complications were also compared within 6 months post injury between patients who developed a depressive episode at greater than 6 months after injury and those who did not.

**Results:** After matching, incidence of new-onset depressive episodes after injury was similar for thoracic (2.5%) and cervical (2.3%) cohorts (risk difference 0.002;  $p=0.733$ ). Multivariate prediction of post-injury depressive episodes found older age at injury (HR 1.325;  $p<0.001$ ) and preexisting mental or behavioral disorders (HR 2.344;  $p<0.001$ ) significantly increased depression risk, while male sex was protective (HR 0.427;  $p<0.001$ ). Depressed patients had higher rates of chronic pain (OR: 14.593, 95% CI: [7.08, 30.081]), paraplegia (OR: 2.895, 95% CI: [1.618, 5.178]), neurogenic bowel (OR: 3.137, 95% CI: [1.975, 4.981]), and neurogenic bladder (OR: 2.741, 95% CI: [1.605, 4.68]) compared to those who never developed a depressive episode.

**Conclusions:** Depression is a critical functional outcome in pediatric spinal cord injury. Injury level does not independently influence risk, but older age, female sex, and prior mental or behavioral disorders are key predictors. Neurologic sequelae such as pain, paraplegia, and neurogenic bowel and bladder are all associated with an increased risk of depression. These findings may guide early, individualized clinical screening and risk stratification by neurosurgeons managing this condition, ultimately improving long-term functional outcomes and quality of life.

# Poster Presentation

Round Two (2 PM - 3 PM)

2

## The Effects of Promotive Factors on Exposure to Community Violence Among Urban Middle School Students

### Contributors:

Annalise Ajmani, M2, VCU School of Medicine

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### Abstract:

**Purpose:** During adolescence, exposure to community violence (ECV) can negatively impact multiple facets of health and future achievement. Existing research mainly focuses on the risk factors that increase an adolescent's ECV, but multiple promotive factors are associated with lower levels of ECV. However, research has not examined the unique and combined effects of these promotive factors on ECV. The current study investigates promotive factors at the individual, peer, and adult levels for their unique and combined associations with ECV to determine which factors are associated with the lowest levels of ECV.

**Methods:** 2,725 adolescents from three urban middle schools (M age = 13.22; 48% male; 90% Black, 18% Hispanic or Latino) reported measures of ECV, positive outlook, self-efficacy for nonviolence, peers' prosocial behavior, friends' support for nonviolence, presence of a caring adult, and parental support for nonviolence.

**Results:** Hierarchical regression analysis showed that a combination of multiple promotive factors better explained the variance in ECV than any single promotive factor alone, indicating that promotive factors have compounding effects. Positive outlook, self-efficacy for nonviolence, friends' support for nonviolence, and the presence of a caring adult were all uniquely associated with lower levels of exposure to community violence across all steps of the hierarchical regression.

**Conclusion:** In alignment with positive youth development theory, these results demonstrate that an adolescent is less likely to be exposed to community violence if they have more promotive factors at their disposal. These findings particularly emphasize the importance of select promotive factors as future targets for strengths-based interventions.

# Poster Presentation

Round Two (2 PM - 3 PM)

3

## Histopathologic Features and Molecular Markers of Encephalocraniocutaneous Lipomatosis (ECCL)

### Contributors:

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### Abstract:

Encephalocraniocutaneous lipomatosis (ECCL) is a rare congenital neurocutaneous disorder characterized by ocular, skin, and central nervous system manifestations. Despite its recognizable clinical features, such as nevus psiloliparus, histopathologic characterization of ECCL remains limited in the dermatopathology literature, and diagnosis is often clinical. This scarcity of published histopathological descriptions makes diagnostic confirmation challenging and underscores the value of synthesizing the available evidence. This comprehensive review synthesizes reported histopathological findings across cutaneous manifestations highlighting key tissue-level features that may aid diagnostic confirmation. Additionally, we review the emerging role of molecular diagnostics, particularly the identification of mosaic activating mutations in *FGFR-1* and *KRAS*, which have been implicated in ECCL pathogenesis. By integrating clinicopathologic correlations with molecular insights, this review aims to enhance our dermatopathological understanding of ECCL, bolstering diagnostic reasoning and clinical decision making for this rare neurocutaneous condition.

# Poster Presentation

Round Two (2 PM - 3 PM)

4

## Pediatric Repetitive Mild Traumatic Brain Injury Elicits T cell-Mediated Neuroinflammation

### Contributors:

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### Abstract:

Pediatric repetitive mild traumatic brain injury (rmTBI) is a major public health concern with links to chronic cognitive dysfunction. Neuroinflammation represents a significant maladaptive outcome after rmTBI. Persistent innate and adaptive immune cell responses can lead to neurodegeneration and deficits in brain development. Therefore, a deeper understanding of the early dynamics of peripheral immune cell infiltration after pediatric rmTBI is critical for the development of effective treatment. We hypothesize that pediatric rmTBI alters neuroinflammation through T cell infiltration. We used wild-type (C57BL/6) and T cell knockout (TCR $\beta$ <sup>-/-</sup>  $\delta$ <sup>-/-</sup>) mice to test this hypothesis. We developed a pediatric postnatal day 21 rmTBI model, with three consecutive subconcussive impact acceleration injuries separated in time by 1 week. After inducing rmTBI in juvenile mice, we observed a progressive infiltration of macrophages, CD8<sup>+</sup>, and CD4<sup>+</sup> T cells into the brain parenchyma, which increased with repeated injury. Furthermore, neuroinflammation in the white matter was detected when we analyzed the lateral corpus callosum (CC). Since increased infiltration of CD4<sup>+</sup> and CD8<sup>+</sup> T cells was detected, we utilized TCR $\beta$ <sup>-/-</sup>  $\delta$ <sup>-/-</sup> mice to further explore the role of T cells on neuroinflammation after pediatric rmTBI. We observed a reduction in the infiltration of pro-inflammatory macrophages and decreased neuroinflammation in the lateral CC. Overall, our findings highlight the significant role of T cell infiltration in the modulation of neuroinflammation following rmTBI in the developing brain, suggesting that they may serve as potential therapeutic targets for managing neuroinflammation following pediatric brain injuries.

# Poster Presentation

Round Two (2 PM - 3 PM)

5

## Neuron-targeted AAV on-demand delivery of Neurogranin for Treating Alzheimer's Disease

### Contributors:

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### Abstract:

Neurogranin (Ng) is a small postsynaptic neuronal protein expressed in the cell bodies and dendrites of excitatory neurons in the hippocampus, cortex, and amygdala. It plays a pivotal role in regulating synaptic plasticity, synaptic regeneration, and long-term potentiation (LTP) through calcium- and calmodulin-dependent signaling pathways. In Alzheimer's disease (AD), early synaptic degeneration is a key pathological feature that contributes to cognitive decline. Clinical studies have demonstrated significant reductions of Ng in AD patients' frontal cortex and hippocampus, accompanied by increased Ng levels in cerebrospinal fluid (CSF), reflecting neuronal loss of Ng. As a result, CSF Ng has emerged as a promising biomarker for early diagnosis and disease progression in AD.

Experimental studies further show that Ng deficiency leads to impairments in hippocampal-dependent learning and memory tasks, whereas increasing Ng expression restores postsynaptic dendritic spine density and morphology and improves cognitive performance. These findings suggest that restoring Ng levels may reverse synaptic degeneration and rescue cognitive dysfunction, supporting its therapeutic potential in AD and related dementias.

In this proposal, we aim to evaluate the therapeutic potential of Ng using a novel adeno-associated virus (AAV) gene delivery system designed to inducibly express Ng in selective excitatory neurons. We hypothesize that enriching Ng expression in the brain via AAV-mediated gene delivery will enhance neural plasticity and improve cognitive function in AD. To test this, we will utilize a new AAV-B-CaMKII-Ng-DD-Q transfer vector (AAV-Ng) carrying the Ng transgene fused to a destabilized eDHFR domain (DD) for trimethoprim (TMP)-inducible expression under the CaMKII promoter, enabling selective transduction of excitatory neurons. The vector will be administered intravenously to 3xTg AD mice at approximately 8 months of age, when AD pathology and cognitive deficits begin to manifest. Therapeutic effects will be evaluated through behavioral assessments, including Open Field, Three-Chamber, Novel Object Recognition, and Morris Water Maze tests, followed by tissue analysis at 12 months of age, when amyloid-beta plaques and tau pathology are established. Cellular and molecular mechanisms will be investigated by examining Ng-associated signaling components, dendritic spine density and morphology, and protein expression changes in the hippocampus, cortex, and amygdala. Successful completion of these studies will provide foundational evidence supporting Ng gene therapy as a potential treatment strategy for AD and related dementias.

# Poster Presentation

Round Two (2 PM - 3 PM)

6

## Retained Foreign Bodies from Faulty Intermittent Catheters in Spinal Cord Injury Patients: A Case Series

### Contributors:

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### Abstract:

**Introduction:** Neurogenic lower urinary tract dysfunction (NLUTD) and urinary retention are common sequelae in persons with spinal cord injury (SCI). Intermittent catheterization is regarded as the gold standard for managing urinary retention, with minimal long-term complications when performed correctly. However, rare instances of catheter malfunction can lead to serious consequences. This case series highlights two occurrences of identical catheter malfunctions and their potential sequelae.

**Case presentation:** Two patients with SCI—one with cervical and one with thoracic level injuries—were found to have retained foreign bodies from intermittent catheterization kits manufactured by the same company. These retained objects were discovered during routine cystoscopic evaluations. One patient presented with intermittent episodes of autonomic dysreflexia and the other experienced frequent urinary tract infections, both of which may have been related to the retained foreign bodies.

**Discussion:** Although rare, retained foreign bodies due to catheter malfunction can pose significant risks in the SCI population, including autonomic dysreflexia, voiding obstruction, and other urological complications. These cases underscore the importance of routine surveillance and annual evaluations by specialists such as physiatrists and urologists to identify and manage such issues proactively.

**Conclusions:** This case series serves as a reminder of the potential risks associated with faulty catheterization equipment and reinforces the need for regular follow-up care in the SCI population to ensure early detection and intervention.

# Poster Presentation

Round Two (2 PM - 3 PM)

7

## Return to Sport Following Sesamoidectomy: A Systematic Review of Timeframes and Clinical Outcomes in Athletes

### Contributors:

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### Abstract:

**Introduction:** Hallux sesamoid pathology can cause persistent forefoot pain and loss of push-off strength in athletes, and sesamoidectomy is commonly performed when prolonged nonoperative management fails.

**Purpose:** The purpose of this systematic review was to synthesize athlete-centered outcomes after partial or complete hallux sesamoidectomy, with an emphasis on return to sport, performance recovery, and postoperative complications.

**Study Design:** Systematic Review

**Methods:** Medline, Embase, and Cochrane were searched through October 2025 for studies reporting outcomes in athletes undergoing sesamoidectomy. Data extraction included demographics, operative laterality, follow-up duration, return-to-sport metrics, return to preoperative performance, and complications.

**Results:** Six studies met inclusion criteria, representing 193 patients. All outcomes of interest were reported in at least four of the six included studies. Female athletes comprised 72.2% of reported cases. The weighted mean return-to-sport rate was 91.87%. The weighted mean time to return was 12.22 weeks. Return to preoperative performance occurred in 83.58% of athletes. Complication rates ranged from 0% to 29.17%, with a weighted mean complication rate of 12.49%.

**Conclusion:** Sesamoidectomy allows most athletes to return to sport at three to four months postoperatively, yet 16% of athletes fail to return to their preoperative level of performance. Complications and rates are variable but are typically well-managed by patients. These findings can help guide preoperative counseling and shared decision-making for athletes considering sesamoidectomy after failed conservative treatment.

# Poster Presentation

Round Two (2 PM - 3 PM)

8

## Beyond Body Weight: The Obesity Paradox and Racial Differences in Outcomes in Pancreatic Cancer

### Contributors:

Charlotte Burch MS3 - VCU School of Medicine

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### Abstract:

**Background:** Obesity is a known risk factor for pancreatic ductal adenocarcinoma (PDAC), yet an "obesity paradox" suggests higher BMI may improve survival in certain malignancies. This study investigated whether this paradox persists across different racial and ethnic groups.

**Methods:** A retrospective TriNetX analysis (2010–2025) of 97,468 PDAC patients was conducted, stratified by BMI and race/ethnicity. Propensity-matched cohorts were balanced for demographics, stage, and comorbidities to evaluate overall survival (OS).

**Results:** A graded survival gradient was observed across BMI categories. Overweight patients demonstrated the best outcomes (median OS 815 vs. 660 days; HR 0.89,  $p < 0.0001$ ) compared to healthy-weight patients, while obese patients had slightly higher mortality than those who were overweight (median OS 808 vs. 855 days; HR 1.05,  $p = 0.0008$ ). Underweight patients faced the highest mortality (median OS 420 days). Notably, Hispanic patients showed improved OS compared to Black (HR 0.76) and White patients (HR 0.83), a trend that remained consistent across BMI strata except among the obese vs. overweight difference. In surgery plus chemotherapy cohorts, the overweight survival benefit was primarily retained among White patients, while Hispanic patients maintained their survival advantage over Black patients (HR 0.79).

**Conclusions:** A graded obesity paradox exists in PDAC, with overweight status associated with optimal survival and underweight status conferring the highest mortality. The consistent survival advantage in Hispanic patients suggests that physiological reserve and racial/ethnic factors significantly influence clinical outcomes.

# Poster Presentation

Round Two (2 PM - 3 PM)

9

## Surgical Management of Wrist Deformity in Radial Longitudinal Deficiency: A Systematic Review

### Contributors:

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### Abstract:

**Introduction:** Management of RLD is multifaceted due to the associated conditions and the pediatric implications of limb correction with continued growth. Currently, there is no clear consensus on optimal treatment and strategies are variable in their surgical approach. The objective of this systematic review is to evaluate the outcomes of surgical management of radial longitudinal deficiency in studies published in the last 10 years, specifically hand forearm angle, range of motion, and complications.

**Methods:** A systematic review was conducted using PubMed, Embase (Ovid), and Cochrane to search for studies through March 2025 that reported on surgical management of radial longitudinal deficiency. Data was extracted on the following topics: study details, patient demographics, follow-up durations, surgical technique, hand forearm angle (HFA), range of motion (ROM), surgical complications, and revision rates.

**Results:** A total of 230 patients (275 limbs) met the inclusion criteria. The average age at surgery was 36.4 months with a follow up period of 63.5 months. 10 of the 15 included studies reported values for HFA, all of which showing correction following surgical procedures, with subsequent loss of correction noted in 4 studies. 10 of the 15 studies included values for range of motion and demonstrated preservation of elbow motion and limitations in wrist motion. Recurrence and reoperations were common.

**Conclusion:** Surgical management of the wrist deformity in RLD remains a widely researched topic with no technique demonstrating clear superiority over another. Heterogeneity in included outcomes and limited functional outcomes demonstrate the need for standardization of studies on RLD.

# Poster Presentation

Round Two (2 PM - 3 PM)

10

## Impact of Childhood Trauma on Distress Tolerance, Cognitive Flexibility, and Executive Function in Youth

### Contributors:

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### Abstract:

**Background:** Stressful life events (SLEs) can cause significant emotional, psychological, and physical distress in youth, which can disrupt development. Exposure to SLEs has been linked to depression, behavioral difficulties, physical health problems, and long-term cognitive impairment. However, most research has focused on adults or college students, highlighting the need to understand better how trauma affects cognitive development in youth to inform prevention efforts.

**Aim:** This study aimed to identify the effects of childhood trauma life events on (1) executive function, (2) cognitive flexibility, and (3) distress tolerance.

**Methods:** Data was drawn from 9986 adolescents in the Adolescent Brain Cognitive Development (ABCD) Study collected between 2021 and 2022. SLEs were measured using the Life Events Scale. Cognitive functioning was assessed using the Behavioral Indicator of Resiliency to Distress Task, Little Man Task, and Game of Dice Task. Linear regression analyses were conducted to examine the associations of SLEs with cognitive function.

**Results:** The average number of SLEs was 2.17 (SD=2.31). SLEs were not associated with distress tolerance and executive function, but significantly predicted poorer cognitive flexibility ( $B=-.032$ , 95% CI  $[-.005 - .000]$ ,  $p=.027$ ). Age and parental marital status were positively associated with all cognitive measures. Parental income and sex were positively associated with cognitive flexibility and executive function, while parental age was positively associated with executive function.

**Conclusion:** Greater exposure to SLEs was associated with poorer cognitive flexibility, suggesting that this domain may be sensitive to early trauma. In contrast, risk-based decision-making and distress tolerance appear resilient to the direct effects of early stress, but may still be influenced by other psychosocial and/or environmental factors. Early intervention that targets cognitive flexibility in trauma-exposed youth may be beneficial. Future research should explore protective and resilience factors in trauma-exposed youth.

# Poster Presentation

Round Two (2 PM - 3 PM)

11

## Postoperative Complications Following Surgical Stabilization of Primary Versus Recurrent Anterior Shoulder Dislocations: A Nationwide Cohort Analysis

### Contributors:

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### Abstract:

**Background:** Anterior shoulder dislocation (ASD) is the most common joint dislocation in young patients with recurrence rates of nearly 90%. Multiple dislocations can cause progressive structural damage and bone loss, increasing the risk of instability. This study compares postoperative complications following ASD between patients with a primary versus recurrent ASD.

**Methods:** A retrospective query was conducted on TriNetX from January 1, 2015 to January 1, 2025, to identify patients aged 18 years or older who underwent surgical repair for either primary or recurrent ASD. Propensity score matching was applied in a 1:1 ratio and estimated using logistic regression. Postoperative outcomes were evaluated at 3 and 6 months and logistic regression analysis was performed to assess multivariable risk factors.

**Results:** The study revealed a total of 2,312 patients who underwent surgical repair for primary ASD compared to 7,594 patients in the recurrent ASD cohort. After propensity score matching, each cohort comprised 2,302 patients. The average age was  $29.7 \pm 14.5$  years in the primary dislocation group and  $28.8 \pm 13.6$  in the recurrent dislocation group. At 3 and 6 months, recurrent dislocation and shoulder instability were significantly higher in the recurrent ASD group compared to the primary ASD group ( $p < 0.0001$ ). Reoperation rates were significantly higher in the recurrent ASD group at 6-months ( $p = 0.0159$ ). Elevated BMI significantly increased odds of postoperative shoulder instability ( $p = 0.022-0.038$ ). Epilepsy/recurrent seizures were significantly associated with postoperative instability in primary and recurrent repair groups ( $p < 0.01$ ).

**Conclusion:** Patients undergoing surgical repair for recurrent ASD experienced significantly higher short-term rates of recurrent instability and reoperation compared to those treated for primary ASD, reflecting greater biomechanical compromise in recurrent cases. These findings highlight the importance of bony stabilization procedures, such as the Latarjet, in recurrent instability, where isolated soft-tissue repair has a limited role.

# Poster Presentation

Round Two (2 PM - 3 PM)

12

## Same Presentation, Different Diagnoses: A Novel Approach to Teaching Postpartum Headache

### Contributors:

Meredith Christian, M3, VCU School of Medicine  
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Abirami Sivakanthan, M2, VCU School of Medicine  
Michelle Troendle, MD, VCU Department of Emergency Medicine

### Abstract:

**Background:** Mock oral board examinations are underutilized in medical education despite the opportunities they offer medical students to apply clinical reasoning outside of direct patient care. While traditional case formats involve multiple unrelated scenarios, we developed three nearly identical oral board cases each featuring postpartum headache. The cases highlight how subtle differences in presentation can lead learners down distinct diagnostic pathways and management strategies. This curriculum has been incorporated into the third-year Obstetrics and Gynecology (OBGYN) clerkship at Virginia Commonwealth University School of Medicine (VCUSOM), providing a novel approach to teaching diagnostic reasoning across several clinical presentations.

**Methods:** We conducted a quasi-experimental pretest-posttest study. Students completed a pretest and participated in three oral board-style cases involving a patient with postpartum headache, each case differing subtly in key findings. They were then assessed using a critical actions checklist which evaluated essential diagnostic and management steps, including neurologic examination, appropriate diagnostic testing, and initiation of treatment. After facilitated debriefing, students completed a posttest and Likert-scale survey assessing confidence in diagnosing and managing postpartum headache.

**Results:** Seventeen students participated. The mean pretest and posttest scores were 52.35% (SD 20.33) and 88.82% (SD 10.48), respectively. A Wilcoxon signed-rank test yielded a statistically significant difference between scores (test statistic ( $W$ ) = 194.5,  $p < 0.0001$ ). Learners reported increased confidence in obtaining relevant patient history and neurologic exam, ordering diagnostic studies, and diagnosing/managing patients presenting with postpartum headache on the Likert questionnaire. Students also reported a strong interest in continuing this pedagogical approach.

**Conclusions:** Subtly varied oral board cases enhance diagnostic reasoning and learner confidence. This innovation has been incorporated into the third-year OBGYN clerkship curriculum at VCUSOM, with plans to expand to additional clinical scenarios requiring nuanced differentiation including facial droop, galactorrhea, paralysis, and patients presenting with hypotension and bradycardia.

# Poster Presentation

Round Two (2 PM - 3 PM)

13

## **Structural Access as a Determinant of Formal Help-Seeking for Behavioral Health: The Moderating Roles of Insurance Coverage and English Proficiency among Spanish-Speaking Immigrants.**

### **Contributors:**

Alexander Cigularov, Medical Student (rising M3), Virginia Commonwealth University School of Medicine  
Oswaldo Moreno, Ph.D., Associate Professor in Psychology, Virginia Commonwealth University

### **Abstract:**

#### Background

Latino immigrant communities in the United States continue to face substantial inequities in access to formal healthcare services, even when experiencing significant health-related distress. Structural barriers such as limited insurance coverage and reduced English language proficiency are widely recognized as obstacles to care. However, less attention has been given to how these barriers shape whether health distress results in engagement with formal healthcare systems.

#### Methods

This study analyzed cross-sectional survey data from a community-based sample of Spanish-speaking, foreign-born adults who completed at least half of the survey measures (N = 125–127). Hierarchical moderated regression analyses tested whether insurance coverage and English language proficiency conditioned the association between health distress and formal help-seeking, controlling for income. All predictors were mean-centered, interaction terms were included in final models, and significant interactions were examined using simple slopes analyses at low (–1 SD), mean, and high (+1 SD) levels of each moderator.

#### Results

Health distress was positively associated with formal help-seeking overall, but this relationship was significantly moderated by insurance coverage ( $\Delta R^2 = .093$ ,  $p < .001$ ) and English language proficiency ( $\Delta R^2 = .049$ ,  $p = .008$ ). Simple slopes analyses showed that health distress did not predict formal help-seeking at low levels of insurance coverage but demonstrated increasingly strong positive associations as coverage increased. A similar pattern emerged for English proficiency, with the weakest associations at low proficiency and the strongest at high proficiency.

#### Discussion and Conclusions

Findings indicate that health distress alone is insufficient to prompt formal help-seeking when structural access barriers remain unaddressed. Insurance coverage and English language proficiency function as essential enabling resources that determine whether health need can be translated into care utilization. These results underscore the critical need for policy interventions that expand insurance eligibility, protect coverage for immigrant populations, and strengthen language access services.

# Poster Presentation

Round Two (2 PM - 3 PM)

14

## Reducing Post-Operative Opioid Exposure in Neonatal Abdominal Surgery: A Quality Improvement Initiative

### Contributors:

Authors: Mallika Datta<sup>1</sup>, Pankaj Kumar<sup>1</sup>, Nayef Chahin<sup>1</sup>, Russell Moores<sup>1</sup>, Paola Aranda Valderrama<sup>2</sup>, Beata Evans<sup>2</sup>, Tina Kirshenbaum<sup>1</sup>, Carolyn Hill<sup>3</sup>, Erinn Danby<sup>1</sup>, Autumn Williams<sup>1</sup>, Kimberley Williams<sup>1</sup>, Lauren Jovel<sup>1</sup>, Patricia Lange<sup>4</sup>

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### Abstract:

**Rationale/Background:** Post-operative pain management in neonatal intensive care unit (NICU) patients represents a critical quality and safety opportunity. Untreated neonatal pain is associated with physiologic instability, including desaturation episodes, increased intracranial pressure, and neurologic injury such as intraventricular hemorrhage and neuronal cell death. Additionally, opioid exposure in neonates is linked to adverse neurodevelopmental outcomes, including decreased cerebellar volume, lower motor and cognitive scores, prolonged mechanical ventilation, and delayed attainment of full enteral feeds. Despite these risks, baseline data from the Children's Hospital of Richmond NICU demonstrate substantial post-operative opioid exposure following abdominal surgery, with only 56% of laparoscopic cases requiring no opioids and a mean opioid dose of 2.512 MME/kg/day following open procedures. Opportunities exist to strengthen multimodal, opioid-sparing analgesia strategies.

**Methods:** This quality improvement initiative targets NICU patients undergoing elective, semi-elective, and selected urgent open abdominal surgeries. Patients receiving pre-operative opioids or undergoing concurrent major procedures (e.g., tracheostomy) are excluded. Interventions include standardizing post-operative IV/oral acetaminophen use, increasing peri-operative regional anesthesia utilization, and reinforcing multidisciplinary education and peri-operative care pathways. The project aims to increase opioid-free laparoscopic cases from 56% to  $\geq 75\%$ , reduce opioid exposure in open cases to  $\leq 1.5$  MME/kg/day, increase post-operative acetaminophen use from 69% to 90%, and increase regional anesthesia utilization from 13% to  $\geq 25\%$ .

**Evaluation Plan:** Opioid exposure will be measured as mg/kg from return to the NICU through post-operative day 7. Process and outcome measures will be reviewed quarterly. Balancing measures include post-operative extubation rates, unplanned extubations, and time to initiation of enteral feeds to ensure analgesia changes do not negatively impact respiratory stability or recovery.

**Conclusions / Potential Impact:**

This initiative is expected to safely reduce neonatal opioid exposure while preserving effective post-operative analgesia. If successful, this initiative may inform standardized, opioid-sparing peri-operative pathways for high-risk neonatal surgical populations and support improved short- and long-term neurodevelopmental outcomes.

# Poster Presentation

Round Two (2 PM - 3 PM)

15

## Triple Arthrodesis Outcomes and Complications: A Systematic Review

### Contributors:

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### Abstract:

**INTRODUCTION:** Triple Arthrodesis (TA) involves fusion of the sub-talar, talonavicular, and calcaneocuboidal joints, performed to treat congenital and acquired hindfoot deformities to alleviate pain and restore gait. Despite its long history, the post-operative outcomes and complication rates remain inconsistently reported. The purpose of this review is to evaluate the outcomes and complications associated with TA in managing hindfoot disorders.

**METHODS:** This study is a systematic review that was conducted in accordance with the PRISMA standards. Medline, Embase, and Cochrane were searched through May 2025 for studies investigating patients treated with TA. Data were extracted on demographics, surgical indication, fixation methods, follow-up duration, outcome scores, patient-reported outcomes, union rates, and complications.

**RESULTS:** A total of 25 studies, including 978 patients (1105 TA), met the inclusion criteria. The mean patient age was 42.75 years, with 44.33% male, with an average follow-up of 80.75 months. The most common indications were adult-acquired flatfoot deformity (29.2%), neuromuscular deformities (16.5%), and post-traumatic or degenerative arthritis (9.4%). Rigid internal fixation with screws and/or staples was the most common fixation method used. The weighted average satisfaction rate among patients treated with primary TA was 87.9%. AOFAS score demonstrated post-operative improvement, with an average 25.6 points increase noted in 5 studies (n=80). Radiographic analysis demonstrated an average non-union rate of 11.8%, with the talonavicular joint being the most common site. Progressive adjacent joint arthritis was a common long-term finding with 43%-72% occurrence rate. Common complications included symptomatic non-union or revision surgery, wound healing issues, and painful hardware requiring removal.

**CONCLUSION:** TA has been successfully utilized to treat end-stage hindfoot deformities, particularly flatfoot disorders. The procedure is definitive, yielding high patient satisfaction rates and significant functional improvements; however, it poses a substantial risk of progressive arthritic changes in adjacent joints over the long term. The risk of non-union remains notable, especially at the talonavicular joint, suggesting that additional reinforcement at this site may improve outcomes. Findings suggest that achieving corrective post-operative alignment is critical for higher patient satisfaction.

# Poster Presentation

Round Two (2 PM - 3 PM)

16

## Adolescent Athlete Psychological Response And Acoustic Startle Following Concussion: A Preliminary Investigation

### Contributors:

Mahima C. Desai, M2 VCU School of Medicine

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Jessie R. Oldham, PhD, VCU Department of Physical Medicine & Rehabilitation

### Abstract:

**BACKGROUND:** Athletes who suffer sports-related concussion commonly exhibit post-concussion physical and psychological symptoms (1); however, return to play is often centered around physical recovery alone. (2) We lack the same understanding and comprehensive protocol on psychological health recovery. (3) The acoustic startle reflex is a psychophysiological measure that has historically been considered a clinical indicator of anxiety (4). While adolescent athletes have demonstrated a suppressed acoustic startle reflex following concussion (5), it is unclear whether post-concussive psychological symptoms are associated with psychophysiological outcomes. Therefore, the purpose of our study was to investigate potential associations between psychological and psychophysiological outcomes following concussion in adolescent athletes.

**METHODS:** This was a prospective, cross-sectional study of 18 adolescent athletes (age  $14.7 \pm 2.0$  years, 50% female) who were recently medically cleared post-concussion. Participants completed the Patient Health Questionnaire-4 (PHQ-4), Psychological Readiness to Return to Sport questionnaire (I-PPRS), and an acoustic startle reflex evaluation using facial electromyography of the orbicularis oculi muscle. We used linear regressions to determine if there were significant relationships between psychological (PHQ-4, I-PPRS) and psychophysiological (acoustic startle reflex) measures.

**RESULTS:** There were no statistically significant relationships between acoustic startle reflex and PHQ-4 ( $F(1,16)=0.25$ ,  $R^2=0.02$ ,  $p=0.62$ ) or I-PPRS ( $F(1,16)=0.41$ ,  $R^2=0.03$ ,  $p=0.53$ ).

**CONCLUSIONS:** Overall, there were no significant associations between post-concussion psychological and psychophysiological measures. These initial findings suggest that there may be minimal relationships between self-report psychological measures and more objective psychophysiological measures of mental health once athletes have been medically cleared from their concussion. An objective psychophysiological tool to assess post-concussion mental health may help avoid biases from self-reported surveys and ultimately allow clinicians to more effectively treat athletes' psychological recovery. As this preliminary study was in a cohort of adolescent athletes who were recently cleared from their concussion, future studies should examine this relationship more acutely following concussion.

# Poster Presentation

Round Two (2 PM - 3 PM)

17

## Evaluating the predictors of persistent opioid use following arthroscopic orthopedic surgery

### Contributors:

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### Abstract:

Although opioid prescribing practices following surgery have shifted in recent years, the opioid crisis continues to significantly impact postoperative patients. Chronic opioid use after orthopedic surgery is associated with poorer clinical outcomes and increased adverse events, including decreased functional status, infection, dislocation, impaired healing, and development of opioid use disorder (Berardino et al., 2021). While the existing literature thoroughly evaluates opioid use following open orthopedic procedures, comparatively less research has examined long-term opioid use after arthroscopic surgery. The objective of this study is to determine the incidence and predictors of chronic opioid use following arthroscopic orthopedic surgery. We hypothesize that a measurable proportion of opioid-naïve patients undergoing arthroscopic procedures will develop chronic opioid use and that preoperative opioid exposure risk factors, comorbid mental health conditions, higher perioperative opioid prescriptions, and demographic factors will be independently associated with increased odds of chronic use. Using the TriNetX database, a retrospective cohort study will be conducted including opioid-naïve adult patients undergoing arthroscopic orthopedic procedures. Chronic opioid use will be defined as at least one opioid prescription more than three months postoperatively or greater than or equal to ten days' supply between three to six months after surgery. Incidence rates will be calculated per 100 patients. Multivariable logistic regression will be performed to estimate adjusted odds ratios (aORs) and 95% confidence intervals for predictors of chronic opioid use. Covariates will include age, sex, race, comorbid psychiatric diagnoses, substance use disorders, pain diagnoses, and perioperative opioid prescription characteristics. Evaluation of model performance will include assessment of discrimination using the area under the receiver operating characteristic curve and calibration using goodness-of-fit testing. Findings will inform risk stratification strategies and guide evidence-based postoperative prescribing practices following arthroscopic surgery.

# Poster Presentation

Round Two (2 PM - 3 PM)

18

## Complex Anesthetic Management of Subarachnoid Hemorrhage Complicated by Acute Takotsubo's Cardiomyopathy: A Case Report

### Contributors:

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### Abstract:

Here, we describe the delicate anesthetic management of a patient who had a massive SAH and an associated TC with EF 15%, who presented for an emergent endovascular angiogram with coiling. A 51-year-old female with a past medical history of asthma was admitted to the ICU after presenting at an outside facility with high grade SAH. On initial workup, significant ST elevations were noted on EKG along with elevated troponins. Apical ballooning and wall motion defects were seen on TTE along with a low EF of 15%. A multidisciplinary meeting was held between neurointensivists, neurosurgery, anesthesiology, and cardiology to discuss the need to emergently treat the SAH vs the risk of a catastrophic intraoperative cardiac collapse following myocardial infarction. After discussion with the patient's family members on the risks and benefits, the decision was made to proceed with the procedure. SAH-associated TC is a reversible neurogenic cardiomyopathy, however there is limited documentation of anesthetic guidelines to direct perioperative care (1). The anesthesiology team was initially consulted by the neurosurgical team on whether it was feasible to perform coiling on such a critically ill patient. On one hand, waiting to intervene on a massive SAH in the hopes of treating TC would risk neurological devastation. On the other hand, surgical intervention in the patient's current condition would risk intraoperative myocardial infarction and catastrophic cardiac collapse.

Ultimately, a multidisciplinary team weighed in on conservative measures vs intervention, and a discussion was held with the patient's family members. We recommend for such cases to involve all the relevant parties to reach a joint decision. Here, with careful management, we show that it is not only possible to undergo the surgery, but also life-altering as the patient made a full neurological and cardiac recovery thereafter.

# Poster Presentation

Round Two (2 PM - 3 PM)

19

## The PIN TEAMS Study: Positive and Intentional Nurturing of Teamwork, Empowerment, and Altruism among Medical Students

### Contributors:

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### Abstract:

To encourage a culture of collaboration and peer support, PINS TEAMS is a peer-nomination system inspired by the DAISY Award in nursing that was developed and implemented to recognize compassionate and competent care among medical students. The purpose of this peer nomination program was to foster camaraderie and teamwork among classmates during clinical years of medical training. Third-year medical students at the VCU School of Medicine nominated peers who demonstrated kindness, integrity, or exceptional teamwork. Nominated students received enamel pins to wear on their ID badges with select stories featured in a weekly class-wide e-newsletter, offering public recognition. The statements of impact were analyzed and found themes of peer support positively impacting students' clinical experiences. Many reported feeling less anxious and more confident when approaching new rotations or challenging shifts, with noticeable improvements in clinical performance and preparation. Students felt better equipped for patient care, more competent during presentations, and more efficient in navigating hospital systems. This support also fostered stronger team integration and smoother transitions into new environments, contributing to a more positive and collaborative workplace. On a personal level, students described reduced stress, fewer missed meals, and a greater sense of well-being, underscored by the encouragement and companionship of their peers. Pre- and post-intervention surveys demonstrated statistically significant increases in students' willingness to seek professional or emotional help from classmates, confidence in their peers' investment in one another's success, and belief that they could rely on their cohort during difficult times. The PIN TEAMS study offers an evidence-based, student-led strategy to promote a culture of peer support in medical education and improve class cohesion and camaraderie with findings that also help localize opportunities for mutual support among students to specific topics that are critical for clinical success but not typically included in medical curricula or student onboarding.

# Poster Presentation

Round Two (2 PM - 3 PM)

20

## Building Capacity for Patient-centered CER Focused on Anal Dysplasia and Cancer in Central Virginia

### Contributors:

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### Abstract:

Anal cancer is a rare cancer. Current rates of anal cancer are increasing at a faster rate in women than men. Despite the increasing incidence, routine screening remains low. The method of screening for and treating the precancerous condition in anal cancer, currently viewed as the “gold standard”, involves anal cytology and high-resolution anoscopy (HRA) with ablation of identified dysplastic lesions. Prior experience in anal dysplasia and cancer prevention has largely focused on high-risk patient groups and applying models of care used in cervical cancer to anal cancer. The seminal study in anal cancer control is the ANCHOR trial which demonstrated that treating anal HGSIL identified using HRA reduced rates of progression to anal cancer. However, there are challenges to broadly applying this model including patient burden, workforce limitations, and features of anal anatomy and anal HPV biology. Current gaps in knowledge include 1) No stakeholder implemented research, 2) Unclear screening pathways, and 3) Provider inconsistencies/unawareness with screening.

The goal of this project is to develop an authentic stakeholder consortium prepared to conduct patient-centered comparative effectiveness research (CER) focusing on advancing anal cancer screening. This intends to transform research focus from pathologic outcomes to strategies that also prioritize patient satisfaction, comfort, and engagement throughout the screening process. This Patient-Centered Outcomes Research is comprised of four stakeholder groups: patients, caregivers, clinicians, and non-clinical healthcare workers. Through a series of quarterly trainings and symposia, the stakeholders are developing value maps to document values and explore how these values construct their perspectives on the benefits, burdens, and limitations of current anal cancer screening pathways. Using the SEED Method (Stakeholder Engagement in Question Development and Prioritization), by the end of the stakeholder curriculum, the group will create a prioritized list of research questions that will serve as an agenda to guide future patient-centered CER.

# Poster Presentation

Round Two (2 PM - 3 PM)

21

## Same Snake Envenomation, Different Clinical Presentation: A Novel Way to Approach Simulated Cases Presenting with Snake Bites

### Contributors:

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### Abstract:

#### Background

Experiential learning through simulation labs provides students with structured environments to develop essential skills to care for patients. N. American crotalids have numerous toxins that may result in different clinical presentations, creating a challenge for medical students. To address this, we designed a simulated case of a patient with various presentations of a crotalid snake envenomation.

#### Methods

Fourth-year medical students and residents participated in a quasi-experimental pretest-posttest study. Learners took a pretest to assess baseline knowledge of snakebite envenomation and management. They then received a lecture on snakebite envenomation and treatment, and in groups of 3-5 participated in a simulated clinical case involving a patient with snakebite envenomation, in which varying clinical manifestations modify treatment, including a dry bite, myotoxicity, neurotoxicity, hemotoxicity, and anaphylaxis from the snake venom. Students then took a posttest to evaluate learning outcomes.

#### Results

Thirty learners participated; mean pretest and posttest scores were 55% (SD 19.5) and 91% (SD 12.15), respectively. A Wilcoxon signed-rank test analysis illustrates a statistically significant increase in scores (test statistic: 0.0,  $p < 0.0001$ ).

#### Conclusions, Lessons Learned, and Potential Impact

A simulation with varying clinical manifestations of a snake envenomation allowed learners to adapt their clinical management strategies to a range of presentations, enhancing both diagnostic reasoning and decision-making skills. This approach led to significant improvements in knowledge and self-reported confidence. Key strengths of the curriculum include hands-on experiential learning, collaborative team-based decision making, and measurable gains in medical knowledge. Limitations include a small sample size and substantial time requirements. Our pedagogical approach is practical to implement and can be integrated into any undergraduate medical education curriculum with access to a simulation lab. Future directions include scenarios with chronically ill patients and a future assessment to evaluate long-term retention.

# Poster Presentation

Round Two (2 PM - 3 PM)

22

## Chronic Hippocampal Neuronal Loss and Network Hyperexcitability 6 months post TBI

### Contributors:

Saumya Gupta, Adam Gibson, Grace Dominguez, Paul Koch

### Abstract:

#### Background

Traumatic brain injury (TBI) is a major cause of epilepsy, with post-traumatic epilepsy (PTE) accounting for up to 20% of symptomatic cases. Hippocampal hyperexcitability, especially in the dentate gyrus (DG), is linked to epileptogenesis through loss of inhibitory gating. However, whether early DG changes after TBI, such as mossy cell and interneuron loss, lead to chronic hyperexcitability and PTE remains unclear. We hypothesize that post-TBI hilar neuron loss impairs DG gating and promotes network hyperexcitability and PTE.

#### Methods

Five rats with severe lateral fluid percussion injury (FPI) and three shams underwent hippocampal EEG recordings six months post-TBI. Brains were formalin-fixed, vibratomed, and stained for immunohistochemistry (IHC) with PCP4 (mossy cells in hilus), PV (interneurons), and NeuN (neurons). High-resolution fluorescent imaging was performed bilaterally. Cell quantification was performed using Cellpose and ImageJ. DiI-labeled fluorescent probe tracts validated electrode placement in the DG.

#### Results

Quantitative IHC revealed a significant reduction in neurons in the DG and specifically PV<sup>+</sup> interneurons in the injured hippocampus compared to the contralateral, non-injured side and compared to Sham controls. Normalized signal density and average cell area both decreased significantly following TBI. These findings correlate with our electrophysiological findings in the same animals of impaired DG inhibitory gating and hippocampal hyperexcitability 6 months after TBI.

#### Conclusion

These data suggest that loss of hilar mossy cells and interneurons may contribute to long-term DG hyperexcitability after TBI at a time scale compatible with the development of PTE. Our results offer insight into hippocampal network reorganization post-TBI and may help guide future strategies for preventing or treating PTE.

# Poster Presentation

Round Two (2 PM - 3 PM)

23

## Outcomes of Medial Patellofemoral Ligament Reconstruction and Repair in Patients with Hypermobility Syndromes

### Contributors:

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### Abstract:

**Introduction:** Patellar instability, characterized by frequent patellar subluxations or dislocations, is more likely to occur in patients with hypermobility. The purpose of this systematic review was to evaluate postoperative outcomes of medial patellofemoral ligament reconstruction and repair to treat patellar instability in hypermobile patients.

**Methods:** Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, Medline, Embase, and Cochrane databases were searched for relevant studies up to September 2025. Studies involving patients with clinically diagnosed with hypermobility who underwent medial patellofemoral ligament reconstruction or repair were systematically identified and screened by two independent reviewers. Hypermobility was defined as Beighton score of 5 or more or existing diagnosis such as Ehlers-Danlos Syndrome, Down Syndrome, or generalized joint hypermobility.

**Results:** Six studies were included: four case series, one comparative, and one case control study. The included sample of 149 knees was 20.0% male and 80.0% female. The mean age and follow-up duration were 18.3 years (range 8-49) and 40.9 months (range 12 - 156) respectively. The average Beighton score was 6.9 +/- 1.27. Complications were reported in 26.2% of cases, most commonly residual pain. Other complications included wound dehiscence, loss of flexion, and graft rupture. Recurrent dislocation or instability was reported in 9.4% of cases. The average postoperative Kujala score was 82.5 (Range  $p < 0.001$  -  $p = 0.018$ ). Patients reported “very satisfied/good” or “satisfied/good” outcomes in 91.1% of cases. The average revision rate was 18.0% of cases.

**Conclusion:** Patients with hypermobility syndromes were found to have high Beighton scores, significantly improved post-operative Kujala scores, low instability recurrence, and high patient reported satisfaction scores. Consideration should be given to medial patellofemoral ligament reconstruction or repair as a means of treating patellar instability in patients with hypermobility syndromes.

# Poster Presentation

Round Two (2 PM - 3 PM)

24

## Enhancing Anesthesia Resident Confidence in Neonatal Crisis Management Through Simulation Training

### Contributors:

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### Abstract:

Anesthesiologists may be required to manage unexpected neonatal deterioration in the labor and delivery suite when a Neonatal Resuscitation Program (NRP) team is unavailable or requires assistance. These high-acuity events demand proficiency in NRP algorithms, airway management, and thermoregulation. This initiative evaluated whether targeted high-fidelity simulation could improve anesthesia resident preparedness and confidence in neonatal resuscitation.

Two high-fidelity scenarios were conducted at the VCU SOM Center for Human Simulation & Patient Safety: (1) neonatal bradycardia secondary to endotracheal tube malposition and (2) extremely low birth weight (ELBW) delivery requiring resuscitation. Thirty anesthesia residents participated. Sessions incorporated structured pre-briefs, defined team roles, and NRP-guided interventions, followed by Promoting Excellence and Reflective Learning in Simulation (PEARLS) debriefings emphasizing communication, teamwork, and clinical decision-making. Residents completed pre- and post-simulation confidence assessments using a 5-point Likert scale (1 = very uncomfortable, 5 = very comfortable).

Twenty-six residents (87%) completed post-session evaluations. Pre-simulation assessments demonstrated low comfort across neonatal resuscitation tasks, with <1% reporting they were very comfortable. Following simulation, confidence improved substantially, with 92% reporting they were somewhat or very comfortable. Median comfort scores increased for newborn assessment (1 to 4), mask ventilation (2 to 4), LMA placement (1 to 4), endotracheal intubation (1 to 4), umbilical venous access (1 to 4), and thermoregulation (1 to 5). Debriefings highlighted equipment preparation, role clarity, and closed-loop communication as key learning points.

While limited by small sample size and reliance on self-reported outcomes, consistent qualitative feedback supported the intervention's educational value. Future studies should incorporate objective performance measures and long-term retention assessment. Targeted high-fidelity simulation meaningfully enhanced anesthesia resident preparedness for neonatal emergencies in labor and delivery and the pediatric operating room.

# Poster Presentation

Round Two (2 PM - 3 PM)

25

## Essential Anatomy for Radiology

### Contributors:

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### Abstract:

#### Background:

Interventional (IR) and diagnostic (DR) radiology practice requires a fundamental understanding of anatomy to interpret images accurately and for procedural planning. However, the extent of anatomical education has decreased across training programs, necessitating optimized, evidence-based education, driven by the perspectives of DR and IR clinicians. Prior research has addressed this topic in other health professions; however, the anatomical structures most relevant to radiology practice have not been clearly defined. This study aims to determine essential, radiology-specific anatomy to optimize curriculum development.

#### Materials and Methods:

Contact information for radiology (diagnostic and interventional) clinicians from 157 residency programs (DR = 69, IR = 88) was collected, and direct recruitment emails were sent (N = 780). Participants were asked to rank 1,156 anatomical structures from not important (1) to essential (7) in the following seven regions: Back, Upper Limb (UL), Lower Limb (LL), Thorax (THX), Abdomen (ABD), Pelvis & Perineum (PP), and Head & Neck (H&N). Descriptive statistics were assessed for each structure. Within-group comparisons were conducted (repeated measures ANOVA) to determine differences between essential anatomical regions.

#### Results:

A total of 30 radiology residency faculty (21 DR, 9 IR) responded to the survey. RAD clinicians rated structures significantly higher in the ABD compared to the Back, UL, LL, and H&N ( $p \leq 0.026$ ), and structures in the PP higher than the Back and UL ( $p \leq 0.028$ ). Of the 1,156 structures, 7.5% were classified as essential (none of which were in the Back, UL, or LL), 41.5% were classified as more important, 51.0% were classified as less important, and no structures were classified as not important.

#### Conclusion:

Radiology faculty prioritized abdominal and pelvic anatomy over musculoskeletal and other regions, highlighting a clear hierarchy of anatomical relevance specific to radiologic practice. Only a small proportion of structures were deemed essential, underscoring the need for more focused, discipline-specific anatomy education for radiology trainees. These findings provide an evidence-based foundation for refining anatomy curricula to better align with the practical needs of both diagnostic and interventional radiologists.

# Poster Presentation

Round Two (2 PM - 3 PM)

26

## Acute-on-Chronic Valproic Acid Overdose: A Toxicology Simulation Case for Medical Students

### Contributors:

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### Abstract:

#### Background

Valproic acid is an antiepileptic medication and overdose is relatively common but often underemphasized in curricula, resulting in a knowledge gap. Simulation-based education provides students a structured environment for students to care for patients. We created a simulated case of a patient presenting with valproic acid overdose.

#### Method

Fourth year medical students participated in a quasi-experimental pretest-posttest study. Students first took a pretest to assess their baseline knowledge of the pharmacokinetics and pathophysiology of valproic acid. They then received a lecture on valproic acid and in groups of 3-5 participated in a simulated clinical scenario involving a patient with valproic acid overdose. A critical actions checklist was used to evaluate performance. After the simulations, students received a structured debrief. Students then took a posttest which was identical to the pretest for evaluation of learning outcomes.

#### Results

Thirty students participated. Mean pretest and posttest scores were 54% and 98%, respectively, with a statistically significant difference on a Wilcoxon-signed rank test (test statistic 0.0,  $p < 1 \times 10^{-9}$ ). All groups obtained the items on the critical actions checklist within 15 minutes.

#### Conclusion

Valproic acid overdose is an underrepresented clinical presentation in many medical school curricula, and this simulation provides students with an opportunity to treat it in a simulated setting prior to encountering it in a real clinical setting. Small variations on the clinical presentation of our simulated patient can additionally allow for student practice with additional branches of the treatment algorithm, including L-carnitine, dialysis, or activated charcoal.

# Poster Presentation

Round Two (2 PM - 3 PM)

27

## Outcomes of Primary Reverse Total Shoulder Arthroplasty in Younger Patients (≤65 Years Old): A Systematic Review

### Contributors:

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### Abstract:

**Background:** Reverse total shoulder arthroplasty (RTSA) is used for osteoarthritis, inflammatory arthritis, rotator cuff arthropathy, and complex humerus fractures. Its utilization in patients ≤65yo is increasing, raising concerns regarding increased functional demand, longer life expectancy, and implant longevity. Previous studies included heterogeneous age groups and revision procedures. This systematic review provides pooled estimates of range-of-motion (ROM) and patient-reported outcome measures (PROMs) among patients ≤65yo undergoing primary RTSA.

**Methods:** Two independent reviewers screened titles and abstracts, reviewed full-texts, and extracted data. Studies reporting outcomes for patients ≤65yo undergoing primary RTSA for any indication, implant design, surgical approach, or fixation method were included. Cadaveric or biomechanical studies, review articles, expert opinions, case reports, surgical technique papers, or studies without separately reported outcomes for patients ≤65yo or primary RTSA were excluded. Quantitatively pooled outcomes included ROM measures and PROMs (ASES, VAS, Constant-Murley, SST, SPADI, UCLA shoulder score) and revision and complication rates. WOOS, DASH, and SANE were reported in single studies and summarized qualitatively.

**Results:** Thirteen studies met inclusion criteria. Across studies, n-weighted mean age was 56.8yo, 59.7% of participants were female, and follow-up ranged from 2-7.8 years. Pooled ROM outcomes were forward flexion=133.9° (95%CI 126.9-140.9); external rotation=38.4° (95%CI 32.5-44.3); abduction=117.7° (95%CI 109.7-125.7); and internal rotation=3.96 (95%CI 3.35-4.57, 0-7 scale). Pooled PROMs were: ASES=67.6 (95%CI 62.8-72.5); VAS=2.60 (95%CI 1.3-3.9); Constant-Murley=62.7 (95%CI 60.0-65.3); SST=7.5 (95%CI 5.9-9.1); SPADI=38 (95%CI 33.3-42.7); and UCLA=27.9 (95%CI 26.9-28.8). Pooled complication rate was 14% (95%CI 6%-30%); revision rate was 8% (95%CI 5%-14%). Sensitivity analyses demonstrated significant improvements in forward flexion (46.4°; 95%CI 34.5-58.2) and external rotation (16.3°; 95%CI 13.5-19.1).

**Conclusions:** Primary RTSA in patients ≤65yo achieves favorable ROM and PROMs, with forward flexion and abduction exceeding functional thresholds. Given reported higher complication and revision rates in younger patients compared to older cohorts, careful patient selection and preoperative counseling are imperative.

# Poster Presentation

Round Two (2 PM - 3 PM)

28

## Importance of symmetry in differentiating central pontine myelinolysis from pontine glioma

### Contributors:

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### Abstract:

#### Background

Central pontine myelinolysis (CPM) is a form of osmotic demyelination often associated with a rapid correction of hyponatremia, which can lead to apoptosis of cells in the pontine region, and is commonly linked to chronic alcohol abuse disorder.<sup>1-6</sup> It has previously been reported that CPM can be easily misinterpreted for similarly presenting conditions such as pontine glioma.<sup>7-10</sup> The pathogenesis of CPM and the factors that influence patient prognosis remain poorly understood.

#### Description

We report the case of a 38-year-old male with a history of chronic alcohol abuse who was referred for neurosurgical evaluation due to high concern for a pontine glioma. He presented less than two months after rapid correction of hyponatremia and other metabolic deficiencies post refeeding, after abstaining from alcohol use. MRI brain demonstrated a symmetric T2-weighted hyperintense lesion within the pons. On examination, the patient exhibited slurred speech, dysphagia, gait instability, and impaired arm and hand coordination. Over the ensuing months, these symptoms improved and the T2 pontine lesion progressively decreased in size.

#### Results

This represents the longest documented radiological follow-up of CPM in a patient with history of chronic alcoholism, allowing for a longitudinal investigation of the lesion's behavior and the patient's symptoms over a 19-month period. At final follow-up, the patient's deficits had largely resolved, with only mild urinary hesitancy and occasional transient speech disturbance with no other observable motor or sensory abnormalities. The patient's lesion was reduced by 76.27%, with high overall maintenance of symmetry around midline.

#### Conclusion

This case highlights that lesion symmetry on MRI brain is an important radiological factor distinguishing CPM from pontine glioma. To arrive at an accurate diagnosis, one must consider the clinical presentation and symptomatic appearance; patient history, namely chronic alcoholism; and recent treatments, such as rapid correction of hyponatremia or other electrolyte imbalances.

# Poster Presentation

Round Two (2 PM - 3 PM)

29

## The Ethical Implications of Artificial Intelligence in Orthopedic Surgery: A Systematic Review

### Contributors:

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### Abstract:

#### Introduction

Artificial intelligence (AI) is increasingly integrated into orthopedic surgery. However, its adoption raises important ethical concerns. Existing literature primarily emphasizes technical performance, with limited attention to issues that could impact patients and surgeons. Ethical analysis specific to orthopedic surgery remains particularly limited despite expanding AI applications in imaging, prediction, and operative decision-making. A systematic review is needed to synthesize current evidence, identify ethical risks, and highlight gaps prior to broader implementation.

#### Methods

A PRISMA-guided systematic review was conducted using MEDLINE, Embase, Web of Science, and Google Scholar to identify studies published between 2015–2025 addressing ethical considerations of AI in orthopedic surgery. Two reviewers independently screened studies. Extraction was based on publication and study characteristics, AI context, orthopedic subspecialty, ethical domains, proposed mitigation strategies, and depth of ethical analysis using predefined criteria

#### Results

Of 1,393 records screened, 95 underwent full-text review, and 38 studies met inclusion criteria. Moderate ethical analysis was most common (21/38, 55.3%), followed by extensive (9/38, 23.7%) and limited (8/38, 21.1%) engagement. Privacy, consent, and data security (92%) and bias, accuracy, equity, and fairness (82%) were the most frequently discussed domains. Transparency (68.4%), professional accountability (57.8%), and clinical validation/regulation (52.2%) were addressed less consistently. Over 86% of studies were published between 2024–2025, reflecting rapid recent growth.

#### Discussion/Conclusion

Despite rapid growth in publications, ethical engagement in AI applications within orthopedic surgery remains predominantly moderate and concentrated in secondary literature. While privacy and bias are frequently discussed, fewer studies provide extensive analysis or address regulatory and clinical validation challenges. As AI tools transition toward broader clinical integration, insufficient ethical rigor may limit safe and equitable implementation. Future work should prioritize empirically grounded evaluation and specialty-specific ethical frameworks to guide responsible adoption.

# Poster Presentation

Round Two (2 PM - 3 PM)

30

## Swollen Limb: A Toxicology Simulation Case for Medical Students and Residents

### Contributors:

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### Abstract:

**Need, Rationale, or Background:** This innovation sought to address gaps in trainee preparedness for rare toxicologic emergencies by using a simulation to teach the evaluation and management of an undifferentiated unilateral swollen limb due to exotic snake envenomation. We aimed to improve learners' diagnostic reasoning abilities, recognition of high-risk clinical features and need to escalate care, and understanding of systems-based processes required to obtain appropriate species-specific antivenom in emergent settings.

**Description or Methods:** Fourth-year medical students and residents on a clinical toxicology rotation participated in a quasi-experimental pretest-posttest study. Learners completed a pretest assessing knowledge of unilateral limb swelling etiologies then participated in a group simulation involving a simulated patient with altered mental status and unilateral leg swelling. They performed assessment, diagnosis, stabilization, and antivenom acquisition for inland taipan envenomation. A structured debrief followed, after which participants completed a posttest and Likert questionnaire of their experience and perceived learning.

**Results (or, if no results, Evaluation Plan):** Nineteen students participated; mean pretest and posttest scores were 79.7% (SD = 14.55) and 99.5% (SD = 2.09), respectively. A Wilcoxon signed-rank test yielded a statistically significant increase in scores (test statistic: (0.0),  $p = 0.00028$ ).

**Conclusions, Lessons Learned, and/or Potential Impact:** Simulation-based training is a cornerstone of modern medical education, providing students with a structured environment to develop essential clinical skills. However, gaps remain in addressing rare but critical toxicological emergencies that demand prompt recognition and management. By exposing learners to uncommon, life-threatening conditions such as exotic snake envenomation, this simulation enhances critical thinking, expands diagnostic frameworks, and strengthens overall clinical preparedness. These findings underscore the value of experiential learning and support the deliberate incorporation of rare emergency simulations into medical curricula to better equip future providers for real-world challenges in diverse settings, both local and global.

# Poster Presentation

Round Two (2 PM - 3 PM)

31

## Metabolic and Physiologic Exposures Associated with Incident Normal Pressure Hydrocephalus

### Contributors:

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### Abstract:

**Background:** The role of metabolic and physiologic factors in the development of normal pressure hydrocephalus remains obscure.

**Objective:** To evaluate the association between normal pressure hydrocephalus (NPH) development and nine exposure variables including hyperlipidemia, diabetes mellitus type II, essential hypertension, hyponatremia, hypokalemia, chronic kidney disease, acute kidney injury, hypothyroidism, and insomnia using odds ratio analysis.

**Methods:** Using the TriNetX Global Network (approximately 170 million patients from 158 healthcare organizations), we created exposure and control cohorts for each variable (eighteen cohorts in total). Exposure and control cohorts were propensity score matched 1:1 on age, sex, and variable-specific diagnoses or laboratory values. Our inclusion requirements consisted of minimal screening tests to reasonably confirm exposure status and at least five years of baseline observable electronic health record data prior to testing. We excluded any patients with a diagnosis of NPH prior to exposure or confirmatory negative screening.

**Results:** Only chronic kidney disease and acute kidney injury were not significantly associated with NPH. The remaining seven variables were significantly associated: hyperlipidemia OR = 2.514 (CI 2.299–2.748), essential hypertension OR 2.601 (CI 2.428–2.786), insomnia OR 1.763 (CI 1.393–2.23), type II diabetes mellitus OR 1.661 (CI 1.566–1.761), hypokalemia OR 1.427 (CI 1.331–1.531), hyponatremia OR 1.354 (CI 1.263–1.453), and hypothyroidism OR 1.301 (CI 1.216–1.393).

**Conclusion:** Hyperlipidemia, essential hypertension, insomnia, type II diabetes mellitus, hypokalemia, hyponatremia, and hypothyroidism are significantly associated with increased odds of developing NPH.

# Poster Presentation

Round Two (2 PM - 3 PM)

32

## Factors Associated with Continuum of Acute to Post-Acute Care in Stroke

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### Abstract:

**Background/Need:** The transition from acute hospitalization to post-acute care strongly affects recovery, quality of life, and healthcare utilization after stroke. Existing research has focused primarily on older adults, limiting understanding of factors influencing discharge outcomes across a broader adult population.

**Methods:** We conducted a retrospective cohort study of adults  $\geq 18$  years hospitalized with ischemic or hemorrhagic stroke in Virginia acute care hospitals (2017–2021) using the Virginia All-Payer Claims Database. The primary outcome was discharge destination: home, home health, skilled nursing facility (SNF), inpatient rehabilitation facility (IRF), or other. Patient variables included demographics, insurance, comorbidity burden, stroke type, length of stay, and hospital-acquired complications. Facility variables included hospital size, ownership, stroke center status, and county clinical care rankings. Multivariable logistic regression assessed associations between these factors and discharge destination.

**Results:** Greater age, comorbidity burden, hospital-acquired complications, and longer hospital stay were associated with higher likelihood of discharge to post-acute care, especially IRF or SNF. Male patients were less likely than females to be discharged to home health (OR 0.90) or SNF (OR 0.91). Black patients had higher odds than White patients of discharge to home health (OR 1.13), IRF (OR 1.10), and SNF (OR 1.13). Medicaid beneficiaries were more likely than commercially insured patients to be discharged to post-acute care, including home health (OR 1.34), IRF (OR 1.20), and SNF (OR 1.17). Hemorrhagic stroke increased likelihood of discharge to other destinations such as hospice or long-term acute care (OR 1.34).

**Conclusions/Potential Impact:** Post-acute discharge after stroke is influenced by both clinical complexity and sociodemographic factors. Standardized discharge planning that integrates medical needs and social determinants of health may reduce variation and improve long-term recovery outcomes.

# Poster Presentation

Round Two (2 PM - 3 PM)

33

## Post-acute Care Transitions and Hospital Readmission for Individuals with Moderate to Severe Traumatic Brain Injury

### Contributors:

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### Abstract:

Traumatic brain injury (TBI) remains a leading cause of long-term disability in the United States, particularly among older adults. Although early, coordinated rehabilitation improves functional outcomes after moderate to severe TBI (msTBI), post-acute care (PAC) pathways vary widely. Most U.S. studies are conducted within the TBI model systems (TBIMS) network, which focuses on acute hospitalization to inpatient rehabilitation facility (IRF) pathway; however, many individuals with msTBI are discharged home or with home health agencies (HHA). Post-acute care location strongly influences recovery trajectories, which can be indirectly measured by readmission and mortality rates, as these are national indicators of care quality and metrics of care transition success, respectively. Readmission following msTBI occurs most frequently within the first 90 days, and the high rates of readmission observed after msTBI are evidence of avoidable gaps in care. To date, no U.S.-based study has systematically characterized sequential PAC transitions after msTBI and examined their association with 90-day readmission or mortality rates.

We used national Medicare fee-for-service claims data to identify older adults with a first acute hospitalization for moderate, severe or penetrating TBI between 2017 and 2020. After applying selection criteria, the final analytic cohort included 169,653 patients. PAC settings were categorized as none, HHA SNF, IRF, hospice, long-term acute care hospital (LTCH), or psychiatric unit. For each patient, we identified the first, second, and third PAC placements within 90 days of discharge and calculated transition distributions across settings. We then examined associations between initial PAC setting and 90-day hospital readmission and mortality using multivariable regression models adjusted for patient-, facility-, and hospital referral region-level characteristics. By identifying patterns of sequential care transitions and their relationship to rehospitalization, this study aims to inform targeted interventions, improve post-acute care coordination, and reduce avoidable healthcare utilization among older adults with msTBI.

# Poster Presentation

Round Two (2 PM - 3 PM)

34

## Rethinking Ketamine: No Opioid-Sparing Effect After Major Limb Amputation

### Contributors:

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### Abstract:

**Background:** Poorly controlled acute postoperative pain following major limb amputation is associated with increased opioid requirements and chronic pain syndromes. While multimodal analgesia is standard in orthopedic surgery, data regarding ketamine infusions for vascular amputations are limited. This study evaluates the impact of postoperative ketamine on pain perception and opioid consumption in this specific population.

**Methods:** A single-center, retrospective review of major lower extremity amputations (May 2022-April 2025) was conducted. Patients receiving postoperative ketamine infusions were compared to a control group. All patients were assessed for the placement of femoral and sciatic peripheral nerve catheters with continuous bupivacaine infusions for up to 5 days after surgery. Case matching was performed based on intraoperative lidocaine infusion use. Preoperative and intraoperative pain medication administration was assessed in addition to daily oral morphine equivalents (OME) and pain scores (PS) until the fifth postoperative day (POD). Paired t-test, chi-squared test, Wilcoxon signed-rank test, and linear regression were used for data analysis.

**Results:** Sixty patients were included. There was no significant difference in comorbidities between the control group versus the experimental group as measured by the Charlson Comorbidity Index Score ( $6.76 \pm 2.84$  vs.  $5.53 \pm 2.28$ ,  $p=0.206$ ). Hospital length of stay did not differ between groups ( $19.73 \pm 24.35$  vs.  $16.8 \pm 14.28$ ,  $p=0.290$ ). No significant difference in pain scores was observed throughout POD 0–5 ( $2.60 \pm 2.61$  vs.  $2.88 \pm 2.64$ ,  $p=0.334$ ). Conversely, the ketamine group required significantly higher OME in the post anesthesia care unit (PACU) ( $2.53 \pm 8.02$  vs.  $10.13 \pm 19.29$ ,  $p=0.025$ ) as well as on POD 5 ( $20.6 \pm 22.96$  vs.  $40.05 \pm 48.57$ ,  $p=0.026$ ). When case matching for lidocaine use ( $n=29$  pairs), there was no statistical significance between OME or pain scores. Lastly, 10 out of 29 patients (33.3%) in the ketamine infusion group reported at least one adverse event.

**Conclusion:** Adding ketamine infusions to a multimodal regimen did not reduce pain scores. Conversely, it was associated with significantly higher opioid consumption in the PACU and on postoperative day five compared to the control group. This likely reflects confounding by indication, where ketamine functions as a rescue therapy for refractory pain. These findings highlight the need for further prospective protocols to define ketamine's role in amputation and additional research investigating other multimodal adjuncts in the management of acute postoperative pain.

# Poster Presentation

Round Two (2 PM - 3 PM)

35

## Open Abdominal Surgeries Utilizing Neuraxial Anesthesia for High Risk Patients

### Contributors:

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### Abstract:

Anesthetic management in pregnant patients with respect to labor analgesia and operative delivery are well described in the literature; less discussed is the utility of neuraxial anesthesia for elective surgeries in this patient population. This case describes a patient at 36wks who was noted to have an ovarian mass found on routine prenatal screening. Due to the size of the mass, the obstetric team discussed a preterm elective C-Section to deliver the baby while also operating on the mass to determine its pathology and possibility of resection. Specifically, the development of the anesthetic plan while keeping in consideration surgical and patient factors will be discussed. After a thorough risk versus benefit conversation with the patient, CSE was successfully administered. With the use of neuraxial anesthesia, it is theorized that elective surgeries can safely be performed in pregnant patients without requiring postponing the surgery or exposing the patient and baby to general anesthesia.

# Poster Presentation

Round Two (2 PM - 3 PM)

36

## Expanding the Donor Pool: Safe Recovery in Living Liver Donors Over Age 50

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### Abstract:

**Purpose:** Older age is often considered a contraindication for living liver donation. However, as global demand for liver transplantation rises, increasing the donor pool to include well-selected older individuals could improve transplant availability. This study compares the recovery of living liver donors aged > 50 to younger donors to evaluate the feasibility and safety of donations in this patient population.

**Methods:** This retrospective cohort study analyzed 52 donors who underwent open or robot-assisted donor hepatectomy from February 2020 and December 2024 at a single tertiary care center. Patients were stratified into older donors (>50 years, n=10) and younger controls (n=42). Data included demographics, surgical history, intraoperative characteristics, and postoperative outcomes. Primary endpoints included length of stay, postoperative complications (such as ileus, bile leak, and bleeding), liver function outcomes (measured by total bilirubin, ALT, AST, and INR), and incidence of liver dysfunction prior to discharge.

**Results:** Older donors were more likely to have a history of prior abdominal surgery (90% vs 38.1%,  $p < 0.001$ ). BMI was similar between groups (26.9 vs 27.6,  $p = 0.826$ ), with no statistically significant difference. Intraoperative characteristics, including estimated blood loss, parenchymal transection time, warm ischemic time, and operative time showed no statistically significant differences. Postoperatively, ileus was the most common complication, occurring at a significantly higher rate in older donors compared to younger donors (50% vs. 35.7%,  $p = 0.045$ ). Aside from a significantly lower peak INR in the older donors (1.5 vs 1.7,  $p = 0.046$ ), there were no statistically significant differences in postoperative lab values at POD3, POD5, or peak between the groups. No older donors experienced liver dysfunction prior to discharge, whereas three younger donors did (0% vs 7.1%,  $p = 0.007$ ).

**Conclusion:** Older living liver donors (>50 years) had similar intraoperative outcomes and liver function recovery to younger donors, despite higher rates of prior abdominal surgery and postoperative ileus. No older donors experienced liver dysfunction. These findings suggest that carefully selected older donors can safely undergo living liver donation.

# Poster Presentation

Round Two (2 PM - 3 PM)

37

## Noise Exposure in the Neurosurgical Operating Room

### Contributors:

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### Abstract:

**Background:** Occupational noise-induced hearing loss (NIHL) is one of the most common occupational conditions worldwide and is a preventable cause of morbidity. Neurosurgeons and operating room personnel are exposed to repeated high-intensity noise from surgical equipment, yet intraoperative noise exposure in neurosurgery remains undercharacterized.

**Methods:** A prospective sound survey was conducted in the neurosurgical operating room using National Institute for Occupational Safety and Health (NIOSH) protocols. An external calibrated microphone was connected to a smartphone, running the NIOSH Sound Level Meter Application, and positioned within the surgeon's hearing zone during cranial and spinal procedures. Two-minute recordings were obtained during drilling, suctioning, and bone graft preparation. Sound metrics included A-weighted equivalent continuous sound level (LAeq), maximum A-weighted levels (A-max), C-weighted peak levels (LCPeak), time-weighted average (TWA), and projected noise dose.

**Results:** Intraoperative noise levels frequently exceeded NIOSH-recommended exposure thresholds. Drilling bone produced sound levels ranging from approximately 81-113 dB, while suctioning generated levels between 76-117 dB. No significant difference was observed between primary surgeon and assistant exposure (LAeq,  $p = 0.51$ ; A-Max,  $p = 0.67$ ; LCPeak,  $p = 0.73$ ). Electric drills produced approximately 5 dB lower noise levels than pneumatic drills. Sound mapping demonstrated cumulative exposures exceeding 85 dB for up to 17 minutes during routine procedures.

**Conclusions:** Common neurosurgical operating room activities expose surgeons and staff to potentially hazardous noise levels. These findings suggest a risk for occupational NIHL and support implementation of noise-mitigation strategies and further longitudinal studies.

# Poster Presentation

Round Two (2 PM - 3 PM)

38

## Modifiable Risk Factors for Osteoporosis: Evidence from NHANES

### Contributors:

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### Abstract:

#### Background

Osteoporosis affects approximately 200 million people globally, leading to high fracture incidence and significant healthcare burdens. While non-modifiable factors like age and genetics are well-established, identifying modifiable risk factors offers critical opportunities for cost-effective prevention. This study examines how socioeconomic variables, dietary patterns, and food insecurity correlate with bone mineral density (BMD) to better inform resource allocation for screening and nutritional interventions.

#### Methods

Using publicly available NHANES datasets, we analyzed spine DEXA scans, demographic data, food access, and diet/exercise questionnaires. Osteoporosis was defined by WHO criteria ( $T$ -score  $< -2.5$ ). Following descriptive analysis, a broad logistic model was used to identify key predictors, with the top five variables refit into a parsimonious model. Performance was evaluated via accuracy and confusion matrix analysis.

#### Results

The study included 4,408 patients (443 osteoporotic; 3,965 non-osteoporotic). The osteoporotic cohort was characterized by older age ( $p < 0.001$ ), higher percentage of white race ( $p < 0.05$ ) and lower education levels. The five-factor model achieved 63% accuracy. Reduced risk was associated with 30-day milk consumption, receiving food stamps, and longer duration of breastfeeding. Conversely, increased risk was linked to childhood food insecurity and significant commutes to grocery stores.

#### Conclusions

Our model identifies targetable dietary and food access factors as key osteoporosis risks. Milk consumption was the dominant protective factor, while food assistance programs showed measurable health benefits. The impact of breastfeeding and childhood food insecurity suggests that early-life nutrition significantly shapes lifelong skeletal health. These findings support integrating nutritional and food-access screening into osteoporosis assessments. Improving access to nutrient-dense foods and reducing transportation barriers are viable avenues for reducing the global disease burden.

# Poster Presentation

Round Two (2 PM - 3 PM)

39

## The Impact of Concomitant Atrial Fibrillation Ablation in Non-Mitral Valve Cardiac Surgery: Implications of Technical Approaches on Cost and Outcomes

### Contributors:

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### Abstract:

**Objectives:** In patients with atrial fibrillation (AF) undergoing non-mitral valve cardiac surgeries, the decision to concomitantly treat AF has been a point of contention. Because atriotomies are rarely needed in these procedures, the choice between biatrial or left atrial approach is often determined by surgeon preference and experience. Thus, we compared outcomes, operational considerations, and cost of biatrial versus non-biatrial AF ablation in non-mitral surgeries.

**Methods:** All adult patients undergoing non-mitral valve cardiac operations between 2017 and 2024 with a Society of Thoracic Surgeons Predicted Risk of Mortality (STS PROM) were evaluated from a multicenter, statewide Society of Thoracic Surgeons database (provided by the Virginia Cardiac Services Quality Initiative). Patients were stratified by the technical approach for AF ablation: biatrial vs. non-biatrial (left atrial). Propensity score matching was performed using a 1:1 nearest-neighbor algorithm and propensity scores were calculated for each patient using logistic regression including 12 baseline characteristics. The primary outcome was freedom from AF at discharge. Secondary outcomes included intraoperative blood product use, cardiopulmonary bypass time, 30-day mortality, readmission rate, total intensive care unit (ICU) stay, STS PROM, and overall cost. Baseline patient characteristics and outcomes were compared with Pearson  $\chi^2$  tests for categorical variables and Wilcoxon rank-sum tests for continuous variables.

**Results:** Among 383 patients underwent non-mitral valve cardiac surgeries, 257 (67.1%) had isolated coronary artery bypass graft (CABG), 66 (17.2%) had isolated aortic valve replacements (AVR), 45 (11.7%) had AVR + CABG, and 15 (3.9%) had tricuspid valve repairs. Propensity score matching produced 178 patients: 89 (50%) underwent biatrial ablation and 89 (50%) non-biatrial ablation. Freedom from AF did not differ significantly between groups (14.6% vs. 10.1%,  $p=0.36$ ), nor did 30-day mortality (4.5% vs. 4.5%,  $p=1.00$ ), STS PROM (8.9% vs. 9.3%,  $p=0.65$ ), bypass time (124.9 vs. 120.7 min,  $p=0.53$ ), readmission rates (11.2% vs. 12.4%,  $p=0.82$ ), or ICU stay duration (56.4 vs. 52.5 h,  $p=0.73$ ). The biatrial group, however, had higher intraoperative blood product use (34.8% vs. 19.1%,  $p=0.02$ ) and greater cost of care (\$45,861 vs. \$39,786,  $p=0.04$ ).

**Conclusions:** In propensity-matched patients undergoing non-mitral cardiac surgery, biatrial AF ablation did not improve freedom from AF at discharge compared to left atrial ablation. However, concomitant biatrial AF ablation was associated with greater intraoperative blood product use and higher total costs, with no differences in mortality, bypass time, readmission, or ICU stay. These findings do not support routine biatrial ablation when atriotomy is not otherwise indicated and a selective left atrial-only strategy appears reasonable. Prospective trials with longer-term rhythm follow-up are warranted.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Surgical Versus Nonsurgical Treatment For Adult Spinal Deformity In Elderly: A Systematic Review And Meta-Analysis

### Contributors:

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### Abstract:

Adult Spinal Deformity (ASD) is a misalignment of the spine that occurs at substantially higher rates in the elderly population. ASD can lead to functional disability and a reduction in a patient's overall quality of life, and surgery offers patients the possibility of substantial pain relief and improvement in functional capacity. However, there is limited literature comparing non-operative and operative outcomes in elderly adults with ASD. This study is a systematic review and meta-analysis of elderly adults (>65 years; mean age >73) with idiopathic or degenerative ASD treated with posterior instrumentation (mean 6–10 levels) or nonoperative management. A systematic search of PubMed, Cochrane, Web of Science, and Embase was conducted from inception to present. Studies were screened using Covidence following PRISMA guidelines and included those directly comparing surgical and nonsurgical outcomes with baseline and 2- year follow-up data. Risk of bias was assessed using ROBINS-I. Random-effects meta-analysis was performed, with heterogeneity quantified using  $I^2$  statistics in the R metafor package. Four retrospective single-center studies met inclusion criteria, three of which (107 operative and 93 nonoperative patients) were included in the meta-analysis. Primary outcomes were assessed including health-related quality of life (SRS-22), disability (ODI), and pain (VAS), with secondary outcomes of complication rates, length of stay, and mortality. Random-effects meta-analysis showed significantly higher SRS-22 scores in the operative group compared to the nonoperative group (SMD 0.48; 95% CI: 0.15–0.81;  $p=0.1169$ ;  $I^2=53.02\%$ ). ODI scores showed a nonsignificant reduction in the operative group (SMD  $-7.25$ ; 95% CI:  $-17.77$  to  $3.23$ ;  $p=0.0278$ ;  $I^2=69.19\%$ ). ASD surgery in elderly patients is associated with meaningful improvement in quality of life compared to nonsurgical management. While risk-benefit assessment remains critical in designing care plans and predicting patient outcomes, long-segment surgery on a case-by-case basis is an appropriate approach for elderly ASD patients.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## The Laennec Technique: A Potential Candidate for the Standardization of Right Robotic Donor Hepatectomies

### Contributors:

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### Abstract:

**Background:** The Laennec approach to Glissonean pedicle isolation in anatomical liver resection has been shown to offer compelling advantages in both laparoscopic and robotic liver resections. Previous research has highlighted its intra- and post-operative benefits in hemihepatectomies, sectionectomy, and liver tumor resection. However, no standardized technique with advantageous outcomes has been elucidated for Glissonean pedicle isolation in robotic donor hepatectomies. This study describes our technique for the Laennec approach for robotic donor hepatectomy in a Western high-volume liver transplant center.

**Methods:** We conducted a retrospective analysis of 35 patients who underwent robotic donor hepatectomy using the Laennec approach at Virginia Commonwealth University Health System from January 2023 to April 2025. Our surgical technique was adapted from previous work by Sugioka et al. for the da Vinci Xi robotic platform. This study evaluated patient demographics, peri-operative, and post-operative outcomes for all patients undergoing this procedure.

**Results:** Notable intraoperative metrics include a median operation time of 446 minutes (range 329-618), a median parenchymal transection time of 164 minutes (range 115-319), and a median blood loss of 150 mL (range 50-700). One case was converted to open surgery due to a gas embolism. Postoperative median peak T. Bil. was 2.75 (range 1.10-5.70) and median peak ALT was 272 (range 138-652). Our 90-day postoperative complication rate was 20%, with one instance of postoperative bleeding, and no instances of bile leak or liver failure.

**Conclusions:** Robotic donor hepatectomy with the Laennec approach demonstrates acceptable operative times, intra- and postoperative outcomes, and complication rates. The Laennec approach for Glissonean pedicle isolation and transection is safe and effective for robotic donor hepatectomy. Further research is needed with larger sample sizes and comparison to the traditional parenchymal approach to validate whether this technique can be standardized and adopted for the robotic donor hepatectomy context.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Effectiveness of pelvic fixation methods combined with magnetically controlled growing rods for the treatment of neuromuscular scoliosis: A systematic review

### Contributors:

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### Abstract:

Neuromuscular scoliosis (NMS) often occurs early in life and is a complex deformity that extends to the pelvis. The pelvic obliquity seen in NMS can affect lung function and sitting balance. The scoliotic curves seen in NMS patients is often too severe to be treated with conservative methods such as bracing. Since magnetically controlled growing rods (MCGR) were introduced, they have become increasingly popular for treating early onset scoliosis (EOS) because they limit the number of procedures the patient must undergo. To address the pelvic obliquity seen in patients with neuromuscular scoliosis, several pelvic fixation and rib-to-pelvis constructs have been explored for use in tandem with MCGR treatment for correction. This systematic review aims to describe the current body of literature on the effectiveness of pelvic fixation methods as an adjunct treatment to MCGR use in patients with neuromuscular scoliosis.

This systematic review searched PubMed, Embase, Web of Science, and CENTRAL for outcomes regarding NMS patients treated with MCGR and pelvic fixation methods until October 1st, 2025. The article types included case studies and series, cohort studies, and randomly controlled trials and included articles were scored using the Methodological Index for Non-Randomized Studies Tool to assess the risk of bias. The search yielded 7 “medium-quality” articles out of 156 articles screened. The results have not been determined yet, however I plan to analyze curve correction, pelvic obliquity, spinal length, thoracic kyphosis, and lumbar lordosis. Additionally, I plan to look at complication rates and reasons for revision procedures. The articles available on this topic are limited by sample size due to the number of eligible patients available at the study centers. This systematic review aims to assess the safety and efficacy of pelvic fixation methods when used with MCGRs to correct spinal deformity in NMS patients.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Barriers to Conducting Locally Impactful Global Health Research: Regulatory, Leadership, and Partnership Challenges

### Contributors:

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### Abstract:

Medical students increasingly engage in global health research to advance health equity in underserved settings. However, student-led initiatives frequently encounter structural, regulatory, and partnership barriers that limit sustainability and locally meaningful impact. Identifying these barriers is essential to designing global health collaborations that are equitable, context-responsive, and institutionally aligned.

We describe the lessons learned from a student-led initiative to evaluate trauma care capacity at Kasr Al-Ainy Hospital, a tertiary referral center in Cairo serving a densely populated region with high trauma burden. The proposed project involved development of a structured trauma capacity assessment survey across five domains: infrastructure, supplies, human resources, provider knowledge, and care processes. Survey domains were informed by local epidemiologic data and refined collaboratively with Egyptian faculty. Project progression was evaluated through structured reflection and systems analysis of regulatory, relational, and leadership barriers encountered during the pre-implementation phase.

Multi-level IRB approvals at both home and host institutions created sequential review requirements, resulting in prolonged administrative delays. Repeated revisions and evolving institutional expectations extended the project in the IRB stage for several months. Limited access to senior leadership and reliance on hierarchical communication pathways constrained timely clarification of requirements and hindered alignment with institutional priorities. Ongoing geopolitical tensions in the region complicated bureaucratic alignment between the host institution and international research team, limiting research access to key areas of the hospital. Cross-cultural differences, language gaps, and variable perceptions of project relevance further contributed to misaligned expectations and inconsistent stakeholder engagement, limiting translation of relationship-building into actionable commitments.

Student-led global health research is particularly vulnerable to systemic inequities in administrative capacity, governance structure, and leadership access. Sustainable collaboration requires early leadership buy-in, clearly distributed ownership, proactive regulatory planning, and alignment of institutional priorities from project inception. These findings inform the development of more scalable, partnership-centered global health initiatives capable of generating durable, locally impactful change.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Hinge Protection Strategies in Medial Opening-Wedge High Tibial Osteotomy: A Systematic Review

### Contributors:

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### Abstract:

**Introduction:** Lateral hinge fracture (LHF) is a complication of medial opening wedge high tibial osteotomy (MOWHTO) associated with loss of correction, delayed union or nonunion, and reoperation. This systematic review compares LHF incidence and radiographic/clinical outcomes across prophylactic hinge-protection strategies to assess whether these approaches reduce LHF without compromising alignment or union.

**Methods:** This review followed PRISMA standards. Medline, Embase, PubMed, and the Cochrane Library were searched through September 1, 2025 for studies on medial OWHTO reporting hinge-related outcomes with or without hinge-protection techniques. Eligible designs included randomized and nonrandomized comparative studies, cohort studies, and case series. Biomechanical, cadaveric, and non-clinical studies were excluded. Extracted variables included LHF incidence, Takeuchi classification, radiographic parameters, union/nonunion, reoperation, complications, PROMs, and plate constructs.

**Results:** 283 studies were screened, 81 full texts reviewed, and 10 included. Across 1,090 patients (422 male, 668 female), three studies comparing prophylactic K-wire protection versus no protection reported lower LHF incidence (Type I: 4.2% vs 20.8%) and faster union (12.4 vs 15.2 weeks), with comparable alignment and improved KOOS. A supplementary anteromedial staple showed no reduction in CT-detected LHF (32.5% vs 35.4%; all Type I). Small versus large opening gaps with K-wires demonstrated similar LHF rates (6.1% vs 9.1%). Biplane versus uniplane osteotomy showed higher early CT-detected LHF (27% vs 12%). Puddu versus TomoFix plates revealed similar LHF rates (17% vs 20%; 6.9% vs 12.5%). Screw angle and plate position showed no difference (13.9% vs 19.3%). Loss of correction was uncommon (3.3%; 5.3%). Functional outcomes improved across studies.

**Conclusion:** Hinge-protection with K-wires lowered LHF while preserving alignment, union, and PROMs. Plate effects were minor, early CT Type I LHF were common, and uniplane osteotomy may reduce early CT-detected LHF compared with biplane. Heterogeneity in methods and outcomes limits comparisons and underscores the need for larger prospective studies.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Locoregional Recurrence After Sentinel Lymph Node Biopsy Following Neoadjuvant Chemotherapy in Node-Positive Breast Cancer

### Contributors:

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### Abstract:

Neoadjuvant chemotherapy (NCT) is commonly used for node-positive breast cancer to downstage disease and potentially to de-escalate surgical management and radiation. Sentinel lymph node biopsy (SLNB) remains the standard technique for evaluating nodal status. However, its use after NCT has been associated with higher reported false-negative rates, raising concerns about the accuracy of axillary staging in this setting. In addition, the need for completion axillary dissection (ALND) for residual positive sentinel nodes has been questioned. However, long-term data on recurrence patterns remain limited.

This study aims to evaluate locoregional recurrence, with a particular focus on axillary recurrence, in breast cancer patients who underwent SLNB following NCT. The project assesses whether negative SLNB findings after chemotherapy reliably reflect eradication of nodal disease and whether ALND for positive SLNs reduces regional recurrence. A retrospective review was conducted of 786 patients diagnosed and treated with NCT between 2004 and 2020 at a single academic cancer center. This period predates the routine use of targeted axillary dissection (marking the biopsied positive node for identification), allowing evaluation of outcomes associated with SLNB alone in patients with previously documented positive nodes

The analysis will explore the correlation between SLNB pathology and subsequent clinical recurrence, including cases in which patients with negative SLNB later develop axillary disease. The outcomes for patients with residual positive nodes who did or did not undergo ALND is also examined. Additionally, the study will examine pathologic factors that may influence regional recurrence risk, including patient age, tumor subtype defined by hormone receptors and HER2 status, pretreatment nodal involvement, pathologic response of the breast primary tumor, and receipt of regional nodal irradiation. By clarifying the reliability of SLNB after NCT and identifying predictors of regional control, this study seeks to inform surgical decision-making and refine axillary management strategies in breast cancer care.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Foundations for Trauma System Evaluation at AlKasr AlAiny Hospital, Cairo

### Contributors:

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### Abstract:

Egypt's healthcare system, challenged by high out-of-pocket costs, workforce shortages, and overcrowded facilities, creates major obstacles to trauma care in low- and middle-income settings. With a population of ~95 million, systemic resource constraints limit timely, effective trauma interventions. AlKasr AlAiny Hospital, a major academic and referral center serving patients across Egypt and the Middle East, provides a critical lens to examine how these challenges affect trauma care delivery.

This study aimed to evaluate trauma care capacity at AlKasr AlAiny Hospital using an initial survey to understand the trauma care capacity, followed by an on-site 460-point survey evaluating 5-categories: infrastructure, supplies, human resources, provider knowledge and processes. Survey design was informed by patient demographics, hospital resources, and trauma burden, with ongoing collaboration with Egyptian faculty to ensure cultural relevance. The goal is to identify strengths and gaps to guide evidence-based strategies for system improvement.

Cairo, Egypt's largest city in Africa and the Middle East, has a 2025 metro population of ~23 million. AlKasr AlAiny Hospital, a 1,200-bed tertiary referral center, provides comprehensive care to a dense urban population. Egypt's dual public-private system places high demand on underfunded public hospitals facing workforce shortages and aging infrastructure. Trauma, particularly road traffic injuries, remains a leading cause of morbidity and mortality (~12,000 deaths annually), straining hospital capacity.

Several barriers emerged early in the study, including difficulty accessing leadership, coordinating within a large hospital, and IRB delays. These challenges highlighted the need for a site balancing scope and feasibility. Moving forward, the evaluation will shift to a smaller, more manageable hospital with more direct administrative access and faster IRB processes. This will enable timely data collection, collaboration with local leadership, and a practical, context-sensitive assessment of trauma care, informing strategies to strengthen care at the new site.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Use of Low-Dose EOS Imaging to Model Morphological Variation of the Hip

### Contributors:

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### Abstract:

**Rationale:** EOS imaging has emerged in the last 20 years to allow for the capture of diagnostic X-ray images at approximately one-eighth the radiation exposure of conventional radiography. EOS can provide a reliable assessment of the proximal femur and pelvis with less radiation; thus, the current study aims to determine the utility of EOS in capturing anatomical variation of the hip joint as measured by active shape modeling.

**Methods:** Ninety-eight participants underwent EOS imaging with a view of the proximal femur and pelvis. Landmark-based statistical shape models were retrospectively constructed using 52 radiographic landmarks to characterize geometric variation in the proximal femur and pelvic complex. Following alignment, principal component analysis was used to derive dominant modes of shape variation. Associations between shape modes and demographic predictors (age, sex, and BMI) were evaluated using multivariable linear regression.

**Results:** Two principal components accounted for 97% of total shape variance with Mode 1 demonstrating increased femoral version and greater pelvic tilt compared to Mode 2. Multiple regression analysis examining whether sex, age, and BMI predicted Mode 1 was overall significant,  $F(3, 93)=2.89$ ,  $p=0.040$ ,  $R^2=0.085$ . BMI was a significant positive predictor ( $\beta=0.23$ , 95% CI [0.03, 0.43],  $p=.023$ ) with higher BMI associated with greater expression of the Mode 1 morphology, indicating measurable morphological differences in femoral version and pelvic tilt were related to body habitus. Sex ( $\beta=-0.22$ ,  $p=0.27$ ) and age ( $\beta=-0.13$ ,  $p=0.20$ ) were not significant predictors after adjustment for covariates, nor was Mode 2 associated with demographic predictors.

**Conclusion:** These findings demonstrate the utility of EOS low-dose radiography in accurately depicting subtle, multidimensional variation in proximal femur and pelvic morphology as measured by active shape modeling. Using active shape modeling as the framework for anatomical variation, enhanced phenotypic characterization relevant to various musculoskeletal disease processes can be accurately assessed with minimal radiation exposure.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Return-to-Play Following Athlete Spine Injury and Treatment in Professional and Collegiate Soccer (Football) Players: A Systematic Review

### Contributors:

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### Abstract:

**Background:** Spinal injury in professional and collegiate soccer (football) players is uncommon but potentially career-altering for athletes. While return-to-play (RTP) after spinal injury has been studied in mixed-sport cohorts, outcomes specific to elite soccer athletes remain poorly characterized.

**Purpose:** To systemically review published literature on spine injuries and surgical or conservative treatment in professional and collegiate soccer players, and to evaluate RTP rates, timelines, level of post-return competition, and general post-return performance outcomes.

**Methods:** A systemic review was conducted in accordance with PRISMA 2020 guidelines. PubMed/MEDLINE was searched through January 10, 2026. Studies were eligible if they reported RTP outcomes in professional or collegiate soccer athletes following spine-related injuries or spine surgeries. Major secondary outcomes included post-return performance and reasons for non-return, and rehabilitation protocols. Due to heterogeneity in study design and reporting methods, findings were synthesized descriptively.

**Results:** Of 123 studies identified after duplicate removal, five met full inclusion criteria, representing 27 athletes. Overall RTP rate was 96.3%, with only one athlete (3.7%) failing to return. The most common injuries were lumbar spondylolysis (51.7%) and lumbar disc herniation (41.4%). Fusion (53.8%) and microsurgical discectomy (42.3%) were the most frequent surgical interventions; 7.4% of athletes were managed nonoperatively. Among those who returned, no study reported a measurable decline in professional performance relative to pre-injury levels. The average time to RTP was approximately seven months, though rehabilitation strategies varied considerably.

**Conclusion:** Current published literature suggests that professional and collegiate soccer players demonstrate high rates of successful RTP following spine injury or surgery, most commonly for lumbar spondylolysis and disc herniation. Athletes generally return at or near their pre-injury performance level. However, available evidence is limited by smaller sample sizes (compared to other contact sports), retrospective designs, and heterogeneous reporting. Further standardized, soccer-specific homogenous research is needed to guide RTP recommendations in elite soccer athletes with spine injury.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Effectiveness of Bias Mitigation Strategies in Artificial Intelligence-Based Skin Cancer Detection Across Diverse Skin Types

### Contributors:

Junpei Tarashi, M3, Virginia Commonwealth University

### Abstract:

**Background:** Artificial intelligence systems for skin cancer detection demonstrate significant performance disparities across skin types, with accuracy rates declining substantially for darker skin tones. This algorithmic bias threatens to exacerbate existing healthcare inequities in dermatology. While various bias mitigation strategies have been proposed, their comparative effectiveness remains unclear, hindering evidence-based implementation. This systematic review addresses the critical need to identify which mitigation approaches most effectively reduce performance gaps across diverse populations.

**Methods:** We conducted a systematic review searching PubMed, IEEE Xplore, ACM Digital Library, and ArXiv through December 2024. Studies were included if they evaluated AI-based skin cancer detection with demographic stratification and implemented bias mitigation interventions. Quality assessment utilized modified QUADAS-2 criteria adapted for AI bias studies. Random-effects meta-analysis quantified pooled effects using R statistical software.

**Results:** Twelve studies representing over 104,000 participants across four continents met inclusion criteria. Four primary mitigation strategies emerged: fine-tuning on diverse datasets, group-specific training, transfer learning, and federated learning. Fine-tuning on diverse datasets demonstrated superior effectiveness, completely eliminating 0.23 AUC performance gaps between skin types. Meta-analysis revealed significant overall effect size of 0.084 (95% CI: 0.072-0.096,  $p < 0.001$ ) favoring mitigation interventions. Studies utilizing validated datasets like Diverse Dermatology Images showed consistently better outcomes than traditional approaches.

**Conclusions:** Bias mitigation strategies, particularly fine-tuning on diverse datasets, significantly improve AI performance equity in dermatologic applications. This evidence provides actionable guidance for developing equitable AI diagnostic tools. **Key lesson:** diverse training data is essential, not optional. **Impact:** These findings can inform regulatory standards, clinical implementation guidelines, and ethical AI development frameworks, potentially reducing diagnostic disparities affecting millions globally.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Prior Pancreatic Drainage Is Associated With Reduced Islet Yield and Glycemic Outcomes After Total Pancreatectomy With Islet Autotransplantation

### Contributors:

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### Abstract:

Total pancreatectomy with islet autotransplantation (TPIAT) is an established treatment for chronic pancreatitis, but postoperative metabolic outcomes vary considerably. Prior surgical history, including cholecystectomy and pancreatic drainage procedures, may influence operative complexity and islet isolation success. The mechanistic relationship between these procedures and post-TPIAT outcomes remains poorly understood.

We conducted a single-center retrospective cohort study of 117 TPIAT patients with one-year follow-up. Patients were stratified by prior cholecystectomy and prior pancreatic drainage (endoscopic stenting or surgical drainage). Multivariable linear regression examined effects on HbA1c, C-peptide, SUIO index, insulin use, and narcotic use while adjusting for age, sex, BMI, symptom duration, and total islet yield. Formal mediation analyses assessed whether islet yield mediates the relationship between prior drainage and glycemic outcomes.

Prior cholecystectomy was not associated with any outcome. Prior pancreatic drainage was associated with significantly lower islet yield (146k vs 321k IEQ,  $p=0.005$ ). Mediation analyses demonstrated that islet yield significantly mediated the effect of prior drainage on HbA1c (indirect effect  $\beta=0.481$ , 95% CI [0.114, 1.049]) and C-peptide (indirect effect  $\beta=-0.459$ , 95% CI [-0.917, -0.180]). Direct effects of drainage on all outcomes were non-significant after accounting for yield.

Prior cholecystectomy was not associated with postoperative outcomes after TPIAT. Prior pancreatic drainage was associated with reduced islet yield, which may contribute to worse glycemic outcomes at one year through a yield-mediated pathway. These findings suggest that earlier surgical referral prior to extensive pancreatic drainage may help preserve islet yield and optimize metabolic outcomes after TPIAT.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Clinical Outcomes of Anterolateral Ligament Reconstruction versus Lateral Extra-articular Tenodesis in Revision Anterior Cruciate Ligament Reconstruction: A Systematic Review and Meta-Analysis

### Contributors:

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### Abstract:

**Purpose:** To perform a systematic review and meta-analysis to compare clinical and stability outcomes of anterolateral ligament reconstruction (ALLR) versus lateral extra-articular tenodesis (LET) as adjuncts to revision anterior cruciate ligament reconstruction (ACLR), and to compare both techniques with isolated revision ACLR.

**Methods:** A systematic review of Cochrane, Embase, and MEDLINE was conducted in accordance to PRISMA guidelines. Studies reporting clinical outcomes or stability following revision ACLR with ALLR or LET were included. Extracted outcomes included pivot-shift, Lachman, Lysholm, IKDC Subjective, return to sport, and failure. Random-effects meta-analyses using standardized mean differences (Hedges'  $g$ ) were performed for Lysholm and IKDC. Odds ratios were calculated for categorical stability outcomes.

**Results:** Twenty-six studies comprising 1,879 patients were included (isolated revision ACLR,  $n=547$ ; ACLR+ALLR,  $n=572$ ; ACLR+LET,  $n=760$ ). Compared with isolated revision ACLR, patients undergoing ACLR+LET had lower odds of residual positive pivot shift (OR 3.30,  $p<0.0001$ ) and those undergoing ACLR+ALLR had similarly lower odds (OR 2.17;  $p=0.0011$ ). No significant difference in pivot-shift stability was observed between ALLR and LET. Lachman outcomes did not differ between groups. All treatment arms demonstrated significant postoperative improvement in Lysholm and IKDC scores, with no significant pairwise differences between techniques. Failure rates were consistently low in ALLR cohorts (0-1.2%) and more variable following LET (0-16.7%). Return-to-sport outcomes favored lateral augmentation over isolated ACLR, with similar rates between ALLR and LET.

**Conclusions:** Both ALLR and LET significantly improve rotational stability compared with isolated revision ACLR, with no clear superiority between techniques. Neither lateral augmentation technique confers superior anterior translational stability, as Lachman outcomes were similar across all groups. Lateral augmentation provides meaningful rotational stability benefits in revision ACLR without differences in patient-reported outcomes between ALLR and LET.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Identifying Symptom Profiles Among Psychiatrically Hospitalized Youth Using Multivariate Methods

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### Abstract:

This project examines symptom patterns among youth admitted to an inpatient psychiatry unit using parent-reported clinical assessments collected at the time of hospitalization. Children requiring inpatient psychiatric care often present with complex, overlapping symptoms that span multiple diagnostic categories. Understanding how these symptoms cluster in acute care settings may improve diagnostic clarity, inform treatment planning, and guide future research on transdiagnostic profiles in high-acuity populations. Data were obtained from parents who completed standardized rating scales describing their child's emotional and behavioral functioning. Measures included the Screen for Child Anxiety Related Emotional Disorders (SCARED), General Behavior Inventory (GBI), Reactive Aggression and Anger scale (RAGA), Retrospective Modified Overt Aggression Scale (RMOAS), Attention-Deficit/Hyperactivity Disorder Rating Scale (ADHD-RS), and the Brief Assessment of Bipolar and Affective Regulation (BABAR). Together, these instruments assess anxiety, mood dysregulation, manic and depressive symptoms, aggression, behavioral and attentional difficulties. The primary aim of this study was to identify symptom clusters within this inpatient population using multivariate statistical approaches. By examining patterns of co-occurring symptoms across domains, we sought to determine whether distinct profiles emerge (e.g., anxiety-dominant, mood dysregulation with aggression, attentional-externalizing, or mixed presentations). Identifying such clusters may clarify the degree to which traditional diagnostic categories align with real-world symptom presentations in acute psychiatric settings. Findings from this project are expected to contribute to a more dimensional understanding of psychopathology among psychiatrically hospitalized youth. Improved characterization of symptom clusters may support more targeted interventions, enhance risk assessment, and inform discharge planning. Ultimately, this work aims to advance clinically meaningful classification approaches that reflect the complexity of children admitted for inpatient psychiatric care.

# Poster Presentation

Round Two (2 PM - 3 PM)

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## A Comparative Study of Duchenne's Muscular Dystrophy in Asian American Male Populations and White Americans

### Contributors:

Arleen Trieu, M2, Virginia Commonwealth University

### Abstract:

Duchenne Muscular Dystrophy (DMD) is a progressive X-linked neuromuscular disorder associated with early morbidity and mortality. Although prior epidemiological studies have identified racial differences in DMD prevalence and mortality, no study has specifically compared the morbidity and mortality between Asian American males and non-Hispanic White males with DMD.

We conducted a retrospective cohort study using the TriNetx research network to identify male patients with DMD and Becker's (BMD) using ICD-10 codes. Two cohorts were created: those with documented cardiopulmonary complications and those without. Mortality rates were compared between the cohorts. Additionally, within the cardiopulmonary cohort, cardiopulmonary resuscitation (CPR) and intubation were used as markers of disease severity to assess morbidity. Comparative analyses and Kaplan-Meier survival analyses were performed.

Results demonstrated patients without cardiopulmonary complications had a significantly lower hazard of mortality compared to those with complications (HR 0.395, 95% CI 0.346, 0.45, log-rank  $p < 0.0001$ ). Severity markers, cardiopulmonary resuscitation and intubation, likewise showed similar results (HR 0.235, 95% CI 0.134, 0.413, log-rank  $p < 0.0001$ ), (HR 0.175 and a 95% CI 0.138, 0.221, log-rank  $p < 0.0001$ ), respectively. In addition, socioeconomic markers, such as education and housing, were also statistically significant between the groups ( $p < 0.0001$ ). However, given the small sample size of the Asian American population in TriNetx, there was not a statistically significant difference between those with cardiopulmonary complications and those without, whereas differences among White Americans, Hispanic Americans, and unspecified racial groups were statistically significant.

Given the heterogeneity of the Asian American population, race alone may not be sufficient to evaluate differences in morbidity and mortality; rather, immigration status, English language proficiency, education, or other social determinants may be better predictors, highlighting the need for more expansive data collection to understand and address these nuances more effectively.

# Poster Presentation

Round Two (2 PM - 3 PM)

54

## **Decitabine and dual immune checkpoint blockade with $\alpha$ -PD-1 and $\alpha$ -LAG-3 combination therapy promotes antitumor efficacy in C57BL/6 mice bearing ICB resistant E0771 murine mammary carcinoma.**

### **Contributors:**

Gina Tuzzolo, M2, Virginia Commonwealth University  
Dr. Harry Bear, MD, PhD, VCU Department of Surgical Oncology  
Laura Graham, Lab Manager, Bear Lab

### **Abstract:**

Decitabine and dual immune checkpoint blockade with  $\alpha$ -PD-1 and  $\alpha$ -LAG-3 combination therapy promotes antitumor efficacy in C57BL/6 mice bearing ICB resistant E0771 murine mammary carcinoma.

Gina M Tuzzolo, Laura J Graham, and Dr. Harry Bear

**Background:** Immune checkpoint blockade (ICB) has shown promise in treating breast cancer, but its efficacy remains largely restricted to selected patients with metastatic and high-risk early-stage triple-negative breast cancer (TNBC). Combining ICB with agents that reprogram the tumor microenvironment (TME) and overcome immunosuppression offers a potential strategy to improve outcomes. Dual checkpoint blockade using  $\alpha$ -PD-1 and  $\alpha$ -LAG-3 can improve exhausted T-cell function by blocking suppressive signals and enhance anti-tumor immunity, and DNA methyltransferase inhibitors (DNMTi) such as decitabine (Dec) could potentially increase ICB efficacy by reversing epigenetic silencing of tumor antigen genes, promoting tumor antigen presentation, and reducing the impact of immunosuppressive myeloid-derived suppressor cells (MDSCs) and reversing T cell exhaustion. **Aims:** To evaluate the therapeutic efficacy of low-dose Dec in combination with  $\alpha$ -PD-1 and  $\alpha$ -LAG-3 antibodies in C57BL/6 mice bearing immune checkpoint blockade (ICB)-resistant E0771 TNBC tumors. **Methods:** Mice (n=34) were randomized into four groups: (1) Control, (2) Dec alone, (3)  $\alpha$ -PD-1+ $\alpha$ -LAG-3 (antibodies), and (4) Dec+ $\alpha$ -PD-1+ $\alpha$ -LAG-3 (combination). A subline of the E0771 murine triple negative tumor was selected by multiple rounds of selection in vivo for resistance to ICB with anti-PD-1 + anti-CTLA4 antibodies. This subline (Generation 5) was also resistant to treatment with anti-PD-1 + anti-Lag3. Tumor volumes were measured over time, and tumors were harvested for immunophenotypic analysis by flow cytometry, focusing on T-cell activation and MDSC infiltration. **Results:** The Dec+ $\alpha$ -PD-1+ $\alpha$ -LAG-3 triple therapy significantly reduced tumor growth compared to control (p= 0.03) and double therapy (p= 0.04) groups. Tumor volumes in the combination group remained consistently lower throughout the study. Preliminary flow cytometric data has revealed a reduction in monocytic MDSCs in the combination group on Day 21 compared to other treatments. **Conclusions:** Low-dose decitabine augments the efficacy of dual checkpoint blockade ( $\alpha$ -PD-1+ $\alpha$ -LAG-3) to enhance anti-tumor immunity and overcome resistance in E0771 TNBC. This combination strategy represents a promising therapeutic approach for immunologically cold breast tumors that have not yet metastasized.

Extramural funding: VCU School of Medicine Dean's Summer Research Fellowship

Massey or ACS-IRG supported pilot: No

Use of Massey shared resources: Flow Cytometry Core

# Poster Presentation

Round Two (2 PM - 3 PM)

55

## Evaluating the Rates of SBI and HSV in Infants with Incidental vs. Non-Incidental Hypothermia and Hyperthermia

### Contributors:

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Amy Doody MD, Virginia Commonwealth University School of Medicine  
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Hillary O'Boyle, MD, Children's Hospital of Richmond at VCU

### Abstract:

#### Background and Objectives

Routine temperatures are commonly taken during well child checks despite no clear AAP recommendations and there is significant variability between practices. Detecting an abnormal temperature can lead to increased healthcare costs and invasive laboratory tests including lumbar punctures, IV antibiotics, hospitalization. There is limited data about the proportion of SBIs and HSV in children with incidentally versus non-incidentally temperature abnormality. Our objective was to measure what proportion of patients with an incidental temperature abnormality have a pathogenic infection and to compare the prevalence of pathologic infection between infants with incidentally and non-incidentally (i.e. symptomatically) temperature abnormality.

#### Methods

This is a retrospective chart review of infants 0-60 days of age who visited Children's Hospital of Richmond Emergency Department with blood culture or documented temperature irregularity ( $\leq 36^{\circ}\text{C}$  or  $\geq 38^{\circ}\text{C}$ ). Our primary outcomes are final diagnosis of serious bacterial infection (bacterial meningitis, bacteremia, urinary tract infection [UTI]) or HSV.

#### Results

After exclusions, 429 charts were reviewed, 48 patients (11.2%) were diagnosed with an SBI (47) and HSV (1). Of the patients with incidental temperature abnormality, 4 were treated for SBI/HSV. These 4 were hypothermic on presentation. For those with non-incidentally hypothermia and diagnosed with SBI, 2 had UTI, 3 with bacteremia and 1 with bacterial meningitis. Twenty-six patients were diagnosed with UTI, 12 with bacteremia, 2 with bacterial meningitis and 1 with HSV for those with non-incidentally hyperthermia.

#### Conclusion

The 4 cases of incidental temperature abnormalities had laboratory findings that may have represented contaminants or false positives but were treated conservatively because of their age and were unlikely to have had a true pathogenic infection. The harms of routine temperature checks include vaccine deferrals, unnecessary antibiotics and x-rays. The benefits of routine temperature checks are still unknown and require further study.

# Poster Presentation

Round Two (2 PM - 3 PM)

56

## Risk Factors for Failure of Patellofemoral Arthroplasty: A Systematic Review

### Contributors:

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Jibanananda Satpathy, M.D., Department of Orthopaedic Surgery, Virginia Commonwealth University

### Abstract:

#### BACKGROUND

Patellofemoral arthroplasty (PFA) is an alternative to total knee arthroplasty (TKA) for the treatment of isolated patellofemoral osteoarthritis (PFOA), offering faster postoperative recovery times and improved knee kinematics. However, PFAs suffer from poorer survival and higher revision rates compared to TKAs. Risk factors predisposing PFAs to reduced survival remain unclear. This review aims to identify factors associated with PFA failure to improve patient selection, guide surgical decision-making, and optimize clinical outcomes.

#### METHODS

This systematic review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting standards. PubMed, Embase, Web of Science, and Cochrane databases were reviewed through March 2025 for studies reporting PFA failure, revision rates, and risk factors for failure. Data was extracted on patient-related factors, preoperative knee morphology, and surgical variables.

#### RESULTS

12 studies (15,709 patients) were included. 14 significant factors were identified – 11 associated with increased risk of failure and 3 factors found to be protective. Protective factors included low BMI, high surgical volume, and previous knee procedures. Patient-related factors associated with failure included younger age and high BMI. Preoperative factors included the absence of trochlear dysplasia, Insall-Salvati Index (ISI) > 2.1, and Patellotrochlear (PT) index < 0.28. Surgical risk factors included large bone resection, concomitant procedures, inlay implant, low surgical volume, large trochlear size, and lack of patellar resurfacing at index surgery.

#### CONCLUSION

Establishing the ideal candidate to receive a PFA implant involves consideration of the patient's characteristics and thorough evaluation of their knee anatomy. Optimal outcomes require proper surgical planning, appropriate implant selection, and precise technique. This study identifies risk factors surgeons must consider to anticipate potential challenges and adapt their approach to achieve optimal outcomes for patients. Further research should prospectively validate these factors and establish strategies to support durable use of PFA to treat PFOA.

# Poster Presentation

Round Two (2 PM - 3 PM)

57

## Patient Presents with Hypotension and Bradycardia: A Novel Triplet Oral Board Approach

### Contributors:

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Sejal Murthy, M2, Virginia Commonwealth University School of Medicine  
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Esha Mittal, M2, Virginia Commonwealth University School of Medicine  
Lilly Nelson, M2, Virginia Commonwealth University School of Medicine  
Zainab Siddiqui, M2, Virginia Commonwealth University School of Medicine  
Dr. Michelle Troendle, MD and Associate Professor, VCU Department of Emergency Medicine - Clinical Toxicology, Virginia Commonwealth University School of Medicine

### Abstract:

**Background:** Mock oral examinations remain underutilized in undergraduate medical education despite their potential to strengthen clinical reasoning. Traditional formats typically present unrelated cases, which can predispose learners to diagnostic tunnel vision. This project evaluates whether presenting medical students with three near-identical oral board cases involving hypotension with bradycardia can improve their ability to generate differential diagnoses, distinguish overlapping clinical presentations, and initiate appropriate management. We hypothesized that this comparative approach would significantly improve diagnostic accuracy compared to baseline knowledge.

**Methods:** Fourth-year medical students enrolled in a clinical toxicology rotation participated in this quasi-experimental pretest-posttest study. Students first completed a baseline pretest assessment followed by three oral board cases involving a patient with altered mental status, hypotension, and bradycardia secondary to third-degree heart block, hypothermia, or beta-blocker/calcium-channel blocker overdose. Learners were evaluated via case-specific critical action checklists. Following the scenarios, learners participated in a structured debrief emphasizing comparative diagnostic reasoning and critical next steps of action. Students then completed a posttest assessment, which was analyzed via the Wilcoxon signed-rank test.

**Results:** Twenty-four students (n=24) completed all phases of the study. Mean pretest scores were 69% (SD  $\pm$  18.6%) and mean posttest scores were 95% (SD  $\pm$  7.6%). A Wilcoxon signed-rank test demonstrated a statistically significant increase in performance (W = 0.0, p, 0.00001, two-tailed). Students demonstrated marked improvement in identifying differentiating clinical features and critical actions across the three scenarios.

**Conclusion:** Presenting multiple, subtly varied versions of the same clinical scenario is a feasible and effective strategy to strengthen diagnostic reasoning skills in medical school. This triplet-case approach has been successfully incorporated into the medical curriculum and expanded to other clinical presentations at our institution. While best suited for small-group instruction, this model is highly reproducible and applicable to educators both within and outside emergency medicine.

# Poster Presentation

Round Two (2 PM - 3 PM)

58

## **Train the Trainer: An Education Proposal for Implementing "Stop the Bleed" Training in Virginia Medical Schools**

### **Contributors:**

Thérèse Weidenkopf, M4, Virginia Commonwealth University

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Edgar Rodas, MD, VCU Department of General Surgery

### **Abstract:**

Hemorrhage is defined as exsanguination from a major arterial blood source which can lead to death within 3-5 minutes. It is the leading cause of death under the age of 45 accounting for 35% of injury-related mortality in the United States<sup>1,2</sup>. Studies have shown that hemorrhage is the most common cause of preventable death and that bystander intervention can decrease hypovolemic shock<sup>4</sup>. Stop the Bleed (STB) is an American College of Surgeons designed program for teaching bleeding control. This study is composed of two aims: 1. evaluate the efficacy of medical student-led STB training compared to training by experienced medical professionals (5 years), 2. analyze the impact of medical student instructors on community members' knowledge retention.

All six medical schools in Virginia have been invited to participate in this study. Participants attended a 90 minute STB course led by either a medical student associate trainer or a certified medical professional with 5 years of experience.

To date, 86 VCU School of Medicine students have been trained with 94.1% (n=81) of students trained as associate trainers. Preliminary data from three sessions (two student led, one professional led) utilized pre-and-post training surveys. Post-survey scores exceeded 50% across all sections, specifically with sessions taught by medical students yielding an 83.58% correct response rate. 95.68% of participants reported high confidence in their ability to teach STB following the session.

The initial findings suggest that medical student associate trainers are effective STB trainers for their peers, supporting a near-peer education model. Ongoing data collection across all Virginia medical schools will continue to compare student led vs. professional led outcomes and eventually transition to community based teaching. Ultimately, this study seeks to establish a sustainable, student-led framework for empowering local communities to manage life-threatening hemorrhage emergencies and reduce preventable trauma mortality.

# Poster Presentation

Round Two (2 PM - 3 PM)

59

## Impact of Generalized Joint Hypermobility Disorder on Outcomes in Anterior Cruciate Ligament Reconstruction: A Systematic Review.

### Contributors:

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### Abstract:

**Purpose:** This systematic review aims to clarify the impact of Generalized Joint Hypermobility Disorder (GJHD) on ACL injury risk and postoperative outcomes compared to non-GJHD patients, in addition to examining optimal graft choice for GJHD patients.

**Methods:** PubMed, Embase, Cochrane, and Web of Science were searched through April 1st, 2025 for studies reporting ACLR techniques and outcomes in patients with GJHD. Outcomes of interest were re-injury/graft failure rate, functional/patient reported outcome measures, and Return to Sport (RTS).

**Results:** Six studies were included in this review featuring a total population of 2,009 patients comprising 941 males (46.8%) and 1,088 females (54.2%), 495 of the patients with identifiable GJHD (32.7%). The average age of patients was 26.7 years. The cumulative graft failure rate ranged from 5.5% to 16.0%, compared to 0% to 4.0% for non-GJHD patients (236 GJHD, 219 non-GJHD). Patients with GJHD experienced a lower rate of RTS within 2 years ( $p=0.041$ ). The presence of GJHD did not appear to influence postoperative pain or functional scores. Bone-patellar tendon-bone (BPTB) autograft was significantly superior to other graft choices, including hamstring tendon (HT) autograft, while the use of anterolateral ligament reconstruction with internal bracing (ALL-IB) had a non-significant trend of decreased re-injury rates.

**Conclusion:** Patients with GJHD are at significant risk for a second ACL injury (cumulative combined graft failure and contralateral ACL injury) and graft rupture (unilateral) following primary ACLR compared to non-GJHD patients. BPTB autografts and ligament bracing may improve graft survival, but the impact of internal bracing is not yet clear. Further large, standardized studies are needed to clarify the impact of GJHD on ACL injury risk and ACLR outcomes.

Level of Evidence: 2a (Systematic Review)

# Poster Presentation

Round Two (2 PM - 3 PM)

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## Early Parent Engagement in the NICU: Associations Between Gestational Age and Initial Skin-to-Skin Contact

### Contributors:

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### Abstract:

#### Background

Preterm infants have unique sensory needs and benefit from developmentally appropriate early parent engagement. Skin-to-skin (STS) contact is a primary indicator of parent-infant engagement, but limited research has examined how early engagement varies by gestational age or how STS within the first 24 hours influences subsequent visitation and caregiving. This study examines variation in early parent engagement by gestational age and whether day-one STS predicts visitation and caregiving in the first two weeks.

#### Methods

This prospective, IRB-approved cohort study included inborn infants born <37 weeks of gestation or those transferred within the first week of life. Infant caregiving and parent education were collected via validated, self-report measures reflecting the first 2 weeks in the NICU. Descriptive statistics, partial Pearson correlation, and Chi square analyses were conducted ( $p < 0.05$ ).

#### Results

In the NICU ( $n = 91$ ), younger gestational age was associated with later initiation of STS and higher parental role stress. Older gestational age was associated with more daily STS and more parental involvement with diaper changes. 27% of parents of extremely premature infants reported being taught containment hold, compared with 58% and 44% among the very premature and late premature parents, respectively. Infants who received STS within the first 24 hours ( $n = 18$ ) had more total STS in the first 2 weeks and longer daily visitation. These parents were more likely to report being taught containment hold, having changed diapers, and experiencing lower parental role stress.

#### Conclusion

Extremely premature infants often receive limited sensory support, with delayed or underutilized STS and containment hold. STS within 24 hours has a ripple effect on other parent caregiving, including more visitation, containment hold, diaper changes, and lower parental role stress. Standardizing early, developmentally appropriate parental engagement may improve outcomes by promoting broader parent involvement during this critical period.

# Poster Presentation

Round Two (2 PM - 3 PM)

61

## Glucagon-Like Peptide-1 Receptor Agonist Use is Associated with Increased Reoperation Rates in Biceps Tenodesis: A Propensity-Score Matched Analysis

### Contributors:

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### Abstract:

**Background:** Glucagon-like peptide-1 receptor agonists (GLP-1 RA) are common agents to manage Type 2 diabetes mellitus (DM) and obesity, both of which can increase the risk of postoperative complications in orthopaedic procedures. However, their effects on outcomes of biceps tenodesis procedures remain unknown. The purpose of this retrospective study is to compare the risk of 90-day and 1-year complications of GLP-1 RA use in patients undergoing open or arthroscopic biceps tenodesis.

**Methods:** A retrospective analysis was conducted using the TriNetX national research network from May 1st, 2005 to December 30th, 2025 to identify patients with GLP-1 RA use within a year before undergoing biceps tenodesis. After propensity score matching, 1,488 patients were identified and matched to a control group, and an additional 300 patients were identified based on the primary indication of GLP-1 RA use (weight loss vs. Type 2 DM).

**Results:** Compared to the control group, the GLP-1 RA group had a significant increase in 1-year rates of reoperation (RR 1.20; 95% CI [1.026-1.40]; P = 0.022). Compared to the Type 2 DM group, the weight loss group had a significant increase in 90-day rates of cardiac complications (RR 1.77; 95% CI [1.00-3.13]; P = 0.048) but a significant decrease in 1-year rates of ED visits (RR 0.66; 95% CI [0.46-0.96]; P = 0.027).

**Conclusion:** There is a significantly higher rate of reoperation following biceps tenodesis in patients with GLP-1 RA use compared to the control group. Furthermore, there was a significantly higher rate of cardiac complications but a lower rate of ED visits in those who used GLP-1 RA for weight loss as opposed to Type 2 DM. These findings suggest that GLP-1 RA use may be associated with an increased risk of reoperation for biceps tenodesis.

# Poster Presentation

Round Two (2 PM - 3 PM)

62

## Creative Arts Therapy for Mental Health : Digital Mobile Application Development

### Contributors:

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Susan Waller, VCU Psychiatrist

a team of 2 AI engineers who helped with the technical aspects of the app and the AI

### Abstract:

**Background:** Mental health disorders are prevalent across age groups, yet many individuals lack access to psychotherapy. Although cognitive-behavioral and mindfulness-based interventions are widely implemented, creative arts therapies remain comparatively underutilized despite ample literature linking dance, expressive writing, and narrative formation with improvements in depression, anxiety, emotional regulation, resilience, and identity formation.

**Description/Methods:** SPARKLES is a digital mental health initiative designed to increase accessibility to structured creative arts–based interventions. The platform integrates 2 different modes - “View” and “Create” - across different art forms like dance, fiction writing, and poetry. Using principles of behavioral activation, narrative meaning-making, mindfulness among other CBT principles, users create their own works of art with the help of SPARKLES AI who has been trained with Crisis Text Line principles to guide users to create art via behaviorally activation-based incremental micro-steps that reduce feelings of overwhelm, decrease cognitive load and promote mastery. SPARKLES AI has been trained to first validate users' experience with good contact techniques (like validations, tentafiers, strength IDs, etc) and then provide structured prompts that preserve user authorship and enable processing of their emotions without producing completed artistic outputs itself.

**Results:** A pilot feasibility study will assess usability, engagement via amount of time spent in Create mode and number of works created, and changes in validated measures of mood, depression, anxiety, and perceived stress over four weeks. Qualitative feedback and comments from users will also guide app improvement for design science methodology.

**Conclusions/Potential Impact:** By embedding creative arts therapy and CBT principles in a scalable digital app, SPARKLES expands access to evidence-based mental health support, especially for users without access to therapy. SPARKLES taps into creative expression as a viable, underrecognized therapeutic modality within psychiatry, education and digital health innovation.

# Poster Presentation

Round Two (2 PM - 3 PM)

63

## Rethinking Postoperative Fluid Management in Kidney Transplantation: Outcomes of A Reduced IV Fluid Protocol

### Contributors:

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### Abstract:

**Background:** In late 2024, a nationwide shortage of IV fluids posed new challenges for perioperative management. While standard protocols emphasize liberal fluid use, the national fluid situation necessitated more responsible fluid management. In order to fulfill this responsibility, our center decreased fluid management for postoperative protocols. However, there is little evidence on the impact of reduced postoperative IV fluid administration on transplant outcomes. This study aims to evaluate the postoperative outcomes between kidney transplant recipients who received a standard postoperative fluid protocol before the shortage and those who received the reduced postoperative fluid protocol after the shortage.

**Methods:** A retrospective chart review of adult patients ( $\geq 18$  years) who underwent kidney transplantation was conducted at a single center between June 2024 and April 2025. A total of 161 patients were included, stratified into a group managed on the standard postoperative IV fluid protocol before October 7, 2025 ( $n=64$ ) and a group managed on a reduced postoperative IV fluid protocol on and after October 7, 2025 ( $n=96$ ). Variables collected included demographics, fluid management and urine output 24 hours after surgery, and outcomes (postoperative creatinine, hospital length of stay, dialysis within the first week of transplant). Statistical analysis utilized independent t-tests and Chi-square tests, with significance defined as  $p < 0.05$ .

**Results:** The age and earliest creatinine pretransplant were significantly different between the two groups ( $p=0.0438$ ;  $p=0.0263$ , respectively). All other baseline characteristics were comparable.

The difference in postoperative fluids to urine ratios between the groups with standard and reduced postoperative IV fluid protocol were statistically significant ( $0.97 \pm 0.42$  v.  $0.57 \pm 0.28$ ;  $p < 0.0001$ ). The differences in postoperative creatinine, hospital length of stay, and whether the kidney transplant recipient required dialysis within one week of the transplant were not significant.

**Conclusion:** A reduced postoperative IV fluid protocol in the setting of kidney transplantation has similar outcomes to a standard protocol in terms of hospital length of stay and dialysis required in the first week following transplantation ( $p=0.9717$ ;  $p=0.5683$ , respectively). Postoperative creatinine was also not significant between groups (Initial:  $p=0.9892$ ; Peak:  $p=0.3386$ ; Terminal:  $p=0.6076$ ). These findings suggest a more conservative fluid management plan could be employed with similar postoperative outcomes. However, longer term data and further studies are needed to support these findings.