

MARSHALL UNIVERSITY JOAN C. EDWARDS SCHOOL OF MEDICINE PRESENTS

*THE 38th ANNUAL MARSHALL UNIVERSITY HEALTH SCIENCE
RESEARCH DAY*



October 02, 2026



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Disclosure of Conflicts of Interest

No Relevant Financial Relationships (RFR) are disclosed by faculty and planners for this CME activity. Since there were no relevant ineligible companies involved in planning, controlling or delivery of our CME activities, no RFR mitigation was needed.

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Accreditation Statement:



Marshall University Joan C. Edwards School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

MUSOM designates this activity for up to 4 hours of AMA category 1 credit.

Physicians should claim only the credit commensurate with the extent of their participation in the activity.

2026 RESEARCH DAY

The conference will consist of a series of oral and poster presentations highlighting basic and clinical research performed by School of Medicine students, residents, and fellows. <https://jcesom.marshall.edu/research/office-of-research-graduateeducation/research-day>

INTENDED AUDIENCE

The Health Science Center 36th Annual Research Day at Marshall University is designed for physicians, residents, basic scientists, medical students, graduate students, and other interested health professionals.

GOALS

- 1) To involve faculty, medical, and graduate students in the process required to formally present their research in either oral or poster presentations.
- 2) To inform and involve the community in ongoing research at Marshall University Joan C. Edwards School of Medicine.
- 3) To encourage the attitude among faculty, residents, and students toward Continuing Medical Education in clinical research.

GLOBAL LEARNING OBJECTIVES

By the end of these lectures the participant will be able to:

- 1) Compare different approaches to medical investigation.
- 2) Compare and contrast the importance of basic research and cellular mechanisms as they relate to human disease.
- 3) Discuss and review research related to current and future improvements in the clinical management of patients.
- 4) Interpret and analyze data for medical investigation to potentially determine the effectiveness of improving patient care.
- 5) Stress the importance of translational research benefits to the basic scientist in support of the practicing physician.

ASSISTED SERVICES

If special arrangements are required for an individual with a disability to attend these events, please contact Continuing Medical Education at (304) 691-1770 no later than 1 week before the event date or see a CME Representative at the Registration Area on the day of the event.

EVALUATION FORM COMPLETION

Please fill in the evaluation forms via the QR code on the following page. Your input is greatly appreciated and is needed for planning future events.

38th Annual Research Day

CME Evaluation can be found on this QR Code. You must fill out an Evaluation to receive CME Credit.



Disclosure of Conflicts of Interest

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PLANNING COMMITTEE - NO CONFLICTS INDICATED

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38th Annual Health Sciences Research Day

St. Mary's Center for Education

Schedule of Events

7:00 a.m. Registration opens for morning and afternoon participants.
Registration will remain open throughout the day.

8:00 a.m. Welcome & Opening Remarks

8:30 a.m. **Oral Session 1** Chair: Dr. Monica Valentovic

Time	Name	Title	Abstract	Page
8:30 a.m.	Esther N. Mensah (Grad Student)	Effects of Different Doses of Synthetic Coolant WS-3 on Nicotine Abuse Liability and Nucleus Accumbens Dopamine Signaling in Adult Mice	#1	11
8:45 a.m.	Kathleen Mai (Medical Student)	Which Patients Benefit Most? Predictors of Reduced Emergency Department Utilization During Outpatient Substance Use Disorder Treatment at PROACT	#2	12
9:00 a.m.	Faith Malone (Grad Student)	Early Life Neurotoxic Insult Disrupts Astrocyte Metabolism and Tripartite Synapse Maturation in the Developing Prefrontal Cortex	#3	13
9:15 a.m.	Olivia Coulter (Grad Student)	NL-1 Can Reverse Cognitive Deficits and Restore Astrocyte Function Following Adolescent Intermittent Ethanol Exposure	#4	14

9:30 a.m. **Break**

9:45 a.m. **Oral Session 2** Chair: Dr. James Denvir

Time	Name	Title	Abstract	Page
9:45 a.m.	Oli Noel (Medical Student)	Clinicopathologic Correlation of Abnormal Cervical Cytology, Reflex HPV Testing, and Histologic Outcomes in a West Virginia Population	#5	16
10:00 a.m.	Alexander Burbelo (Medical Student)	Patient-Reported Return to Sexual Function After Total Hip Arthroplasty: A Multicenter Survey Study	#6	17
10:15 a.m.	Jadyn Simon (Grad Student)	Endometriosis Peritoneal Microenvironment Remodels Human iPSC-Derived Cardiomyocytes	#7	18

10:30 a.m.	Fathima Shaik (Fahema Shaik) (Medical Students)	Gestational Toluene Exposure Alters Cerebrovascular Integrity and Mitochondrial Function in Neonatal Mice: A Pilot Study	#8	19
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10:45 a.m. Break

11:00 a.m. Invited Speaker

12:00 p.m. Lunch

1:00 p.m. Poster #1

2:20 p.m. Break

2:35 p.m. Poster session#2

3:50 p.m. Oral Session 3 Chair: Dr. Jennifer Hanrahan

Time	Name	Title	Abstract	Page
3:50 p.m.	John Dransfeld (Medical Student)	Sodium-Potassium ATPase $\alpha 1$ Haploinsufficiency Does Not Alter Endothelial or Platelet von Willebrand Factor Expression	#9	21
4:05 p.m.	Noah Sherman (Medical Student)	Exosomes from a high-fat diet-induced rat model of obesity mediated the regulation of Na-Glutamine co-transport in intestinal epithelial cells	#10	22
4:20 p.m.	Martin Haney (Grad Student)	Polymicrobial Synergy: Interspecies Interactions Modifying Biofilm Properties	#11	23
4:35 p.m.	Dylan Tayengco (Medical Student)	Exosomal mitochondrial signal as a mechanistic link between aging, diabetes, and cognitive decline	#12	24

4:50 p.m. Awards Ceremony



Gabriel G. Haddad, M.D.

Distinguished Professor of Pediatrics and Neurosciences
Chairman Emeritus, Department of Pediatrics
University of California, San Diego

“Opioids-induced transcriptional regulation in human corticoids”

11 AM Pallotine Room – St. Mary’s Center for Education

Dr. Haddad received his medical education and initial medical training at the American University of Beirut in Lebanon, followed by additional training at the University of Texas in Houston. He then moved to Columbia University in New York to do his fellowship and joined the faculty. At Columbia University, he was the director of the Sleep Laboratory in the Division and trained many fellows. He started his faculty career there and advanced the field of the Sudden Infant Death Syndrome and the understanding of its pathophysiology. He was also the first to describe a disease that is now known as Haddad's syndrome, involving poor drive to breathe (secondary to central pathology), Hirschsprung's disease and abnormally low variability in heart rate.

After 13 years at Columbia, he was recruited to Yale University to direct the Respiratory Medicine Section and serve as Chief of Clinical Service in Respiratory Medicine, and shortly thereafter he became Professor of Cellular & Molecular Physiology at the same institution. He was appointed Chairman of the Department of Pediatrics at Albert Einstein College of Medicine in 2002, and

subsequently moved to UCSD and Rady Children's in 2005.

Dr. Haddad has published over 383 peer-reviewed articles and chapters, and authored numerous medical texts including the landmark Basic Mechanisms of Pediatric Respiratory Disease. He has been on the Long Term Planning Committee, as well as Chair of the Respiratory Neurobiology and Sleep Assembly of the American Thoracic Society and Chair at the NIH for a number of conferences on SIDS and Sleep. He sits on numerous national committees such as the National Heart, Lung, and Blood Institute and March of Dimes, and is a member of 18 distinguished medical societies, many in a leadership role. He has held numerous editorial appointments; is a reviewer for 30 respected medical journals; is the recipient of numerous awards and honors; and has been invited to speak at over 160 national and international conferences. He was elected to the Association of American Physicians in 2008.

Abstract #1

¹Mensah N. Esther, ¹Tetteh-Quarshie Samuel, ¹Sword K. Mason, ¹McCarty L. Chole, ¹Dunlap B. Reese, ¹Riley A. Meredith, ¹McGraw David, ¹Hunter J. Kylee, ¹Bailey Cameron, ¹Henderson J. Brandon

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Effects of Different Doses of Synthetic Coolant WS-3 on Nicotine Abuse Liability and Nucleus Accumbens Dopamine Signaling in Adult Mice

Over the past decade, menthol-flavored cigarettes and electronic nicotine delivery systems (ENDS) have been shown to enhance nicotine use and reinforcement-related behaviors. Menthol has also been implicated in making quitting smoking difficult. Despite regulatory efforts to ban menthol-flavored tobacco commodities, non-menthol synthetic cooling agents, like N-ethyl-p-menthane-3-carboxamide (WS-3), have emerged as substitutes. Hence, the objective of our study was to assess the effect of different doses of WS-3 on nicotine abuse liability and nucleus accumbens (NAc) dopamine signaling. Utilizing a nicotine eVape self-administration assay (EVSA), adult male mice were trained to self-administer nicotine (6 mg/mL) with or without low- or high-dose WS-3 (7.5mg/mL or 15mg/mL). Following EVSA, fast-scan cyclic voltammetry (FSCV) was used to assess dopamine release in the nucleus accumbens (NAc) core. Low-dose WS-3-assigned mice exhibited increased mean fixed-ratio 1 (FR1) and progressive ratio (BP) nose pokes when compared to high-dose WS-3 and nicotine-only assigned counterparts. Furthermore, low-dose WS-3 enhanced reinforcement-related behaviors (FR3) when compared to the nicotine-only group. Data from FSCV show that low-dose WS-3-assigned mice increased tonic and phasic dopamine release in the NAc in a dose-dependent manner. Also, low-dose WS-3-assigned mice showed a positive correlation between mean FR2 or BP nose pokes and phasic dopamine. While mice assigned high-dose WS-3 showed a positive correlation between mean FR3 and phasic dopamine. Results from this study suggest that different doses of synthetic cooling agent WS-3 modulate nicotine reinforcement-related behaviors, possibly due to changes in NAc dopamine signaling.

IRB or IACUC Approval Number: IACUC Approval Number 664

Funding Sources: NIDA (DA060846 to B.J.H)

Abstract #2

~*¹Mai, Kathleen, ¹Grigore, Audrey, ²Shih, Keuitsung 'Philips,' ²Hansen, Zach, ²Davies, Todd,
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Which Patients Benefit Most? Predictors of Reduced Emergency Department Utilization During Outpatient Substance Use Disorder Treatment at PROACT

Introduction: Patients with substance use disorders are associated with frequent emergency department (ED) visits. Factors such as drug choice, polysubstance use, and patient-related characteristics can increase the odds of ED and hospital visits. This study aims to identify clinical predictors of acute care utilization among patients receiving outpatient medication-assisted treatment (MAT).

Methods: A retrospective chart review of deidentified data was conducted on 94 newly admitted patients at PROACT between April 2025 through December 2025. Patient demographics, drug choices, drug type, treatment, treatment duration, ED visits, and hospital days were analyzed.

Associations assessed using the Wilcoxon rank-sum test.

Results: Overall patients (n=94), had fewer ED visits during treatment than when out of treatment (0.0 visits/100 days vs 0.7 visits/100 days; p=0.04). Subcategories of patients older than 50 years old (p=0.003), self-referred (p=0.002), not using opioids (p=0.005), not using methamphetamine (p=0.001), and only using one substance (p=0.001) demonstrated decreased ED utilization.

Discussion: Extrapolating the decreased ED visits to one year, translates to 2.6 fewer ED visits for every patient treated. Protective factors against ED utilization include older age, no opioid or methamphetamine use, self-referral, and an absence of polysubstance use. This paints a picture of lower risk patients having the best benefit from MAT. This displays the importance of harm reduction for even low risk patients. Further studies on risk prediction and targeted interventions are needed to assess ED usage in high-risk populations.

IRB or IACUC Approval Number: 2064041-4

Funding Sources: N/A

Abstract #3

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Early Life Neurotoxic Insult Disrupts Astrocyte Metabolism and Tripartite Synapse Maturation in the Developing Prefrontal Cortex

At the tripartite synapse, peripheral astrocyte processes (PAPs) interact with neurons to regulate synaptic maturation and function. Disruption of these interactions is implicated in neurological and psychiatric disorders, yet the long-term consequences of tripartite synapse dysregulation during early development remain unclear. Prenatal opioid exposure (POE) is an increasingly relevant neurodevelopmental insult associated with significant behavioral and cognitive deficits; however, its molecular mechanisms remain poorly understood.

We investigated POE-associated molecular and cellular changes in the adolescent prefrontal cortex (PFC), a region essential for reward and executive function. Astrocyte-enriched scRNA-seq from P10 cortex identified approximately 600 differentially expressed genes after POE. Genes supporting astrocyte structure and homeostasis were downregulated, whereas mitochondrial function and lipid metabolism genes were upregulated. Preliminary Visium HD spatial transcriptomics corroborated these findings and identified subregion-specific vulnerabilities, suggesting that POE-related synaptic deficits may arise from impaired astrocyte maturation and bioenergetics.

To test whether altered lipid metabolism contributes to opioid-induced astrocyte stress, human astrocytes were acutely treated with buprenorphine with or without fatty acid-binding protein (FABP) inhibitors and DHA lipid loading. Immunocytochemistry for 8-oxoG, TOM20, and perilipin-2 revealed FABP-dependent oxidative stress, mitochondrial disruption, and exacerbated lipid accumulation after opioid exposure in an in vitro model. These metabolic changes are currently being validated in vivo using a mouse POE model previously shown to exhibit persistent alterations in PFC excitatory and inhibitory connectivity.

Together, these findings identify astrocyte metabolic dysfunction as a potential driver of persistent tripartite synapse disruption and altered cortical connectivity following early-life opioid exposure across PFC subregions.

IRB or IACUC Approval Number: IACUC Approval Number 697

Funding Sources: National Science Foundation EPSCoR Track 1 Award OIA-2242771, West Virginia IDeA Network of Biomedical Research Excellence (WV-INBRE) Grant P20GM103434, COBRE ACCORD Grant 1P20GM121299, West Virginia Clinical and Translational Science Institute (WV-CTSI) Grant 2U54GM104942

Abstract #4

~^{1,2}Olivia Coulter, ^{1,2}Hannah G. Sexton, ^{1,2}Alyssa Ihlenfeld, ³Jason Huber, ³Werner Geldenhuys,
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NL-1 Can Reverse Cognitive Deficits and Restore Astrocyte Function Following Adolescent Intermittent Ethanol Exposure

Adolescent binge drinking occurs during a critical period of brain maturation and is associated with increased risk of long-term maladaptive mental health outcomes and alcohol use disorder. Using a rodent model of adolescent binge drinking (AIE), our laboratory and others have demonstrated impairments in anxiety/risk taking and fear-related behaviors that persist into adulthood. Emerging data from our laboratory further demonstrate that AIE drives persistent astrocyte dysfunction, including impaired astrocyte calcium (Ca²⁺) signaling and mitochondrial dysregulation in male rats. Here, we focused on the female rat medial prefrontal cortex (mPFC), a brain region critical for top-down regulation of anxiety/risk taking and fear-related behavior, and investigate how astrocyte dysfunction contributes to behavioral impairment following AIE. We further investigate whether these AIE-induced deficits can be pharmacologically reversed by targeting mitochondrial function. We demonstrate that AIE results in astrocyte mitochondrial dysfunction, increased oxidative stress, and disrupted astrocyte:neuron Ca²⁺ signaling within the female mPFC. These cellular alterations were associated with increased risk-taking and accelerated fear extinction behaviors. Following pharmacological intervention with NL-1 during abstinence, we demonstrate that we can attenuate AIE-induced oxidative stress in astrocytes and normalize the associated behavioral deficits previously observed. These findings identify mitochondrial dysfunction as a critical mediator of long-term neurobehavioral consequences of AIE. Further work is underway to demonstrate that pharmacological targeting of astrocyte-specific pathways is a necessary driver of the behavioral rescue we have observed. This work highlights astrocytes as a promising, non-neuronal therapeutic target for mitigating alcohol-related cognitive dysfunction and improving neuropsychiatric outcomes.

IRB or IACUC Approval Number: 806

Funding Sources: NIH R21AA030086 (PI: MLR) Veterans Affairs (Merit) BX005403 (PI: MLR) NASA WWSGC 80NSSC25M7079 (ORC)

Abstract #5

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Clinicopathologic Correlation of Abnormal Cervical Cytology, Reflex HPV Testing, and Histologic Outcomes in a West Virginia Population

Background: Cervical cancer screening relies on liquid-based cytology and reflex high-risk human papillomavirus (hrHPV) co-testing to guide colposcopic evaluation. This study evaluated the correlation between abnormal cervical cytology, reflex hrHPV testing, and subsequent histologic outcomes in a West Virginia patient population

Methods: A retrospective cohort of 311 patients with abnormal cervical cytology, reflex hrHPV testing, and histologic biopsy correlation (2021–2024) were analyzed. Biopsy-confirmed CIN2, CIN3, and invasive carcinoma were classified as CIN2+ outcomes. Stratified analyses calculated CIN2+ rates across cytology classifications, HPV co-test results, and high-risk genotypes.

Results: Among 311 patients with abnormal cervical cytology and histologic follow-up, 51 (16.4%) had biopsy-confirmed CIN2+ lesions. The likelihood of CIN2+ increased with worsening cytologic abnormalities, ranging from 9.0% for ASC-US and 12.7% for LSIL to 50.0% for ASC-H, 60.0% for AGC, and 92.3% for HSIL. Patients with positive hrHPV testing demonstrated a higher rate of CIN2+ compared with HPV-negative patients (20.4% vs. 6.3%). HPV16- and HPV18/45-positive cases also showed higher CIN2+ rates than other high-risk HPV genotypes. Although AGC represented only 1.6% of abnormal cytology diagnoses, 60% of these patients had CIN2+ or invasive carcinoma on histologic follow-up.

Conclusion: Abnormal cervical cytology combined with reflex hrHPV testing effectively stratifies the risk of clinically significant cervical disease. High-grade cytologic abnormalities, particularly HSIL and AGC, demonstrated the strongest association with CIN2+ on histologic follow-up.

IRB or IACUC Approval Number: IRB: 2449017-1

Funding Sources: N/A

Abstract #6

~¹Burbelo, Alexander, ²Pawl, Caleb, ¹Huffman, Andrew, ²Darbandi, Aria, ¹Stone, William, ³Hiatt, John L., ³Dutta, Arpam, ²Bullock, Matthew

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Patient-Reported Return to Sexual Function After Total Hip Arthroplasty: A Multicenter Survey Study

Background: Pain attributable to hip osteoarthritis can limit intimate relationships, making restoration of sexual function an important goal of total hip arthroplasty (THA). This study evaluated patient-reported return to sexual function following THA, including preferred coital positions, changes in intimacy, and overall satisfaction.

Methods: An anonymous electronic survey was administered to patients who underwent primary elective THA at two academic institutions between 2019 and 2024. The survey assessed demographics, preoperative and postoperative sexual satisfaction, the importance of sexual function, preferred coital positions, and timing of resumption of sexual activity (RSA). Kaplan-Meier analysis and multivariable Cox proportional hazards modeling were used to evaluate time to RSA.

Results: Of 1,311 eligible patients, 416 completed the survey (32% response rate). Overall, 22% reported that hip pain limited sexual activity preoperatively and negatively affected their relationship. Median time to RSA was 10 weeks. Male sex (HR 1.59, 95% CI 1.23-2.07; $p < 0.001$) was independently associated with earlier RSA, whereas ages 60-69 years (HR 0.70, 95% CI 0.51-0.95; $p = 0.02$) and ≥ 70 years (HR 0.65, 95% CI 0.47-0.91; $p = 0.01$) were associated with delayed RSA. Position-specific pain differed by age and sex. Younger patients more often reported discomfort in positions requiring kneeling or hip flexion, whereas older patients reported pain in lateral or rotation-demanding positions. Male patients most frequently identified positions C and G as most painful, whereas female patients identified positions G and J.

Conclusion: THA was associated with improved sexual satisfaction, with most patients resuming sexual activity within 10 weeks. These findings support proactive perioperative counseling regarding sexual function, safe coital positions, and expected timing of resumption to optimize patient-centered outcomes.

IRB or IACUC Approval Number: 2178966-1

Funding Sources: N/A.

Abstract #7

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Endometriosis Peritoneal Microenvironment Remodels Human iPSC-Derived Cardiomyocytes

Background: Endometriosis is a chronic condition affecting roughly 10% of women of childbearing age. It has recently been recognized for its systemic effects and association with increased cardiovascular disease and stroke risk. However, the mechanisms leading to this increased risk remain unclear. This study examined whether bioactive factors in peritoneal fluid (PF) could help explain this risk.

Methods: PF from patients with (Endo-PF) (n=14) and without endometriosis (Control-PF) (n=11) was used to assess its effects on human iPSC-derived cardiomyocytes after 48 hours. The study examined the effects of PF on cardiomyocyte beats per minute using calcium-transient imaging, sarcomere length and organization by gray-level co-occurrence matrix analysis, and molecular responses using a CVD-PCR array. Cells were studied under standard and hypertrophic conditions.

Results: Beating frequency increased with both Control-PF (p=0.0006) and Endo-PF (p<0.0001) compared with media alone. However, the frequencies were higher with Endo-PF than Control-PF (p=0.0214). Both PF treatments increased sarcomere length and reduced organization compared with media alone (p<0.0001). In hypertrophic media, organization was lower with Endo-PF than Control-PF (p<0.0001) or media alone (p=0.0036). Endo-PF altered the expression levels of more than 40% of CVD-related genes, while Control-PF altered less than 10%. Network analysis showed increased representation of adrenoceptor and GPCR signaling pathways.

Conclusions: Endo-PF altered cardiomyocyte beating, sarcomere structure, and CVD-related gene expression. The results provided a possible mechanistic explanation for the association between endometriosis and cardiovascular risk seen in affected patients. This study was IRB-approved by MUSOM (IRBNet ID# 114954-35); informed consent was obtained from all participants.

IRB or IACUC Approval Number: IRBNet ID# 114954-35

Funding Sources: JCESOM intramural funds; NIH Grant P20GM103434; American Heart Association awards 850405 and 25IAUST1377724

Abstract #8

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Gestational Toluene Exposure Alters Cerebrovascular Integrity and Mitochondrial Function in Neonatal Mice: A Pilot Study

Background: Toluene is a volatile solvent found in paints and nail polishes, creating potential for maternal exposure during pregnancy. Its effects on the developing cerebral vasculature of fetuses remain poorly understood. We examined whether gestational toluene exposure alters neonatal growth, cerebrovascular integrity, and vascular mitochondrial function.

Methods: Female C57BL/6J mice (n=10/group) were bred and exposed to filtered air (12 L/min) or low-level toluene (≤ 200 ppm) for 8 h/day on gestational days 1–19. Neonates were delivered naturally or by cesarean section. Weight, length, and litter size were recorded. Cerebrovascular permeability was assessed by Evans Blue cardiac perfusion, and oxygen consumption rate (OCR) was measured in isolated cerebral vessels using Seahorse extracellular flux analysis.

Results: This pilot analysis included two control and six toluene-exposed litters. Toluene exposure was associated with 17.6% lower litter size (7.0 vs. 8.5 neonates/litter) and 5.8% shorter neonatal body length (3.86 vs. 4.10 cm), while body weight was preserved (1.334 vs. 1.326 g). Cerebral Evans Blue accumulation increased 9.1% (0.00832 vs. 0.00762 absorbance/mg protein), consistent with greater cerebrovascular permeability. DNA-normalized basal cerebral vessel OCR was 81.2% lower (1.14 vs. 6.09 fmol/min), accompanied by 78.5% lower non-mitochondrial OCR (1.17 vs. 5.44 fmol/min), indicating markedly altered cerebral vessel oxygen consumption.

Conclusion: Gestational toluene exposure produced developmental, vascular, and mitochondrial functional alterations, suggesting heightened vulnerability of the developing cerebral vasculature to maternal solvent exposure.

Future Steps: These findings will guide larger studies to determine specific molecular targets and pathways that underlie toluene-driven deterioration of developing cerebral vasculature.

IRB or IACUC Approval Number: 26-0690

Funding Sources: N/A

Abstract #9

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Sodium-Potassium ATPase $\alpha 1$ Haploinsufficiency Does Not Alter Endothelial or Platelet von Willebrand Factor Expression

Background: Thrombosis is a leading cause of ischemic stroke and myocardial infarction.

Proteomic analyses have identified the Na⁺/K⁺-ATPase (NKA) $\alpha 1\beta 3$ isoform as the predominant platelet NKA. Our recent study demonstrated that NKA $\alpha 1$ subunit haploinsufficiency significantly inhibits thrombosis in male mice. Previous studies have shown that NKA $\alpha 1$ knockdown attenuates the expression of endothelial adhesion molecules and inflammatory responses. We therefore tested the hypothesis that NKA $\alpha 1$ regulates the expression of von Willebrand factor (vWF), a multimeric adhesive glycoprotein that plays a critical role in thrombosis, thereby contributing to its prothrombotic effects.

Methods: Carotid artery sections collected from NKA $\alpha 1$ heterozygous (NKA $\alpha 1^{+/-}$) and wild-type (WT) mice following an in vivo thrombosis study were analyzed by immunohistochemistry. Plasma and platelets were also freshly isolated from untreated NKA $\alpha 1^{+/-}$ and WT mice, and vWF expression in plasma and platelet lysates were analyzed by Western blotting.

Results: Immunohistochemical analysis demonstrated comparable vWF expression in the endothelial layer and within thrombi (aggregated platelets) of NKA $\alpha 1^{+/-}$ and WT mice, with no apparent differences in staining intensity. These findings were consistent with the Western blot analysis, which revealed no significant differences in vWF protein expression in either platelet lysates or plasma between the two genotypes.

Conclusions: NKA $\alpha 1$ haploinsufficiency does not alter endothelial or platelet vWF expression under basal conditions or during thrombus formation. These findings suggest that the antithrombotic effect of NKA $\alpha 1$ haploinsufficiency is not mediated through alterations in vWF expression, implicating other mechanisms in the regulation of thrombosis by NKA $\alpha 1$.

IRB or IACUC Approval Number: IACUC#: 1033528

Funding Sources: R15HL145573 and R01HL177493 (to WL)

Abstract #10

~¹Sherman, Noah, ¹Wellington, Vivian, ¹Manogaran, Prasath, ¹Singh, Soudamani

¹Biomedical Sciences, Marshall University

Exosomes from a high-fat diet-induced rat model of obesity mediated the regulation of Na-Glutamine co-transport in intestinal epithelial cells

Introduction: In the mammalian small intestine, glutamine is primarily absorbed via Na-dependent co-transport (B0AT1) in the brush border membrane (BBM) of villus cells. Studies have demonstrated that in obesity, B0AT1 is stimulated in villus cells, and that adipose-derived secretome (ADS) stimulated B0AT1. The mechanism was increasing the number of co-transporters in the BBM of intestinal epithelial cells. Further, genetic and pharmacological inhibition of B0AT1 has been shown to improve glycemic control and resistance to high-fat diet-induced (HFD) obesity. However, how HFD-ADS-derived exosomes (EXs) may modulate B0AT1 during obesity is unknown.

Hypothesis: HFD-ADS-Derived exosomes stimulate B0AT1 in diet-induced obesity.

Aim: Elucidate the mechanism of stimulation of B0AT1 by HFD-ADS-derived EXs.

Methods: ADS media was prepared from visceral fat of chow diet (CD) and HFD rats, and exosomes were isolated. Small intestinal epithelial cells (IEC-18) were treated with exosomes derived from CD or HFD ADS and used to perform 3H-glutamine B0AT1-mediated uptake, kinetics, and B0AT1-specific protein expression studies.

Results: In IEC-18 cells treated with EXs from HFD-ADS, B0AT1 was significantly stimulated while Na/K-ATPase activity decreased. Kinetics data indicated that the mechanism of B0AT1 stimulation is due to an increase in the number of co-transporters without changing affinity for glutamine. Western blots showed that B0AT1 protein was significantly increased in cells treated with HFD-ADS-derived exosomes.

Conclusions: Exosomes isolated from HFD-ADS stimulate B0AT1 in IEC-18 cells due to an increase in the number of co-transporters. This mechanism is identical to that seen in vivo. Thus, exosomes in ADS likely mediate B0AT1 stimulation during obesity.

IRB or IACUC Approval Number: IRB: 873

Funding Sources: NIH

Abstract #11

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Polymicrobial Synergy: Interspecies Interactions Modifying Biofilm Properties

Chronic infections, from diabetic ulcers to catheter associated urinary tract infections, are notoriously difficult to treat. A primary reason is the ability of bacteria to form biofilms; structured communities encased in a protective matrix that shields them from the immune system and antibiotics. While often studied as single species, these infections are frequently polymicrobial, and the ways in which different bacterial species interact to shape biofilm architecture and treatment outcomes remain poorly understood. This gap is critical for infections involving methicillin resistant *Staphylococcus aureus* (MRSA), a pathogen with limited therapeutic options that often co occurs with bacteria like *Klebsiella pneumoniae*.

This study investigates how MRSA and *K. pneumoniae* interact within a shared biofilm by integrating high resolution biofilm imaging with in vitro mono and dual species culture models. We quantified biomass, antibiotic tolerance, and characterized spatial biofilm behavior across conditions. We hypothesized that co culture would enhance biofilm formation and alter antibiotic susceptibility relative to single species communities. Imaging supported this hypothesis, revealing distinct spatial arrangement patterns between mono and co culture biofilms following treatment with multiple antibiotics.

Our findings reveal a clinically significant synergistic effect. Co culture biofilms exhibited increased biomass, with *K. pneumoniae* emerging as the dominant species within the mixed community. These polymicrobial biofilms presented robust tolerance to multiple antibiotics; a resistance phenotype not present when either species was cultured alone. This suggests that interspecies interactions can alter the architecture and function of the biofilm community and highlights the need to incorporate polymicrobial dynamics into therapeutic strategies for chronic biofilm associated infections.

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Abstract #12

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Exosomal mitochondrial signal as a mechanistic link between aging, diabetes, and cognitive decline

Background: Type 2 diabetes mellitus (T2DM) accelerates brain aging and increases the risk of cognitive decline, which is associated with mitochondrial dysfunction. Circulating extracellular vesicles (EVs), including exosomes (EXs), may mediate this process by transferring pathologic mitochondria-related cargo (such as RNA and proteins) into brain tissue, leading to accelerated brain aging in T2DM.

Methods: Plasma-derived extracellular vesicles were isolated from middle-aged adults (40–60 years) and older adults (60–80 years) with T2DM via an ultracentrifuge. Particle size and concentration were measured with a Nanotracking System. Vesicle concentration was examined in relation to cognitive score and body mass index (BMI). Exosomal RNA sequencing was used to assess mitochondrial gene expression. For functional testing, exosomes were co-incubated with human neurons, followed by measurement of cytotoxicity and VDAC-1 protein expression.

Results: Circulating EV concentrations increased with age, although the difference is not significant. EV concentrations also map a negative correlation with cognitive score and a weak positive correlation with BMI. Exosomal RNA sequencing demonstrated wide variation in mitochondrial transcript abundance and expression between individuals. Exosomes from diabetic and older participants increased neuronal cytotoxicity compared to controls. Neuronal VDAC-1 expression was reduced after exposure to diabetic exosomes, suggestive of altered mitochondrial function.

Conclusion: These preliminary findings suggest that circulating exosomes in T2DM and aging may contribute to neuronal injury and mitochondrial dysregulation. Exosomal mitochondrial cargo may also provide mechanistic biomarkers linking T2DM, aging, and cognitive decline. Larger sample studies are needed to confirm these associations and definitively link causal pathways.

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Poster Session 1

Abstract #1

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Access to Dermatologic Care in West Virginia: A Statewide Secret Caller Assessment on New Patient Wait Times

Background: West Virginia is well known as being one of the most rural states in the United States. Effects permeate all realms of daily life, including access to reliable healthcare. Access to timely diagnoses on skin malignancies and efficient care for chronic cutaneous diseases is essential for favorable patient outcomes. Although research supports physician shortages and overall rurality in the state¹, there are a lack of studies providing raw data on prolonged wait times.

Methods: Dermatology offices across the state of West Virginia were contacted by telephone using a ‘secret caller’ method and asked for the soonest available new patient appointment for a total body skin examination (TBSE). Wait times were measured in days until the appointment and were compared across Rural Urban Commuting Areas (RUCA) score, provider type, and residency affiliation.

Results: A total of 59 offices were contacted. The average wait time for a new patient to see a physician-level dermatologist in the state of West Virginia was 65.96 days compared to the nationwide average of 53 days², a 24% increase. Mid-level providers such as Nurse Practitioners and Physicians Assistants exhibited shorter wait times, averaging 30.9 days in the state.

Conclusions: Dermatologic care in West Virginia is burdened by prolonged wait times, particularly in rural communities. Expansion of residency programs may help improve access. Our findings highlight the inequities of dermatologic care in West Virginia and should help healthcare administrators and policy makers in future decision making on funding underserved regions.

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Abstract #2

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Real-World Outcomes of Beta-Blocker Therapy in Patients with Coexisting Heart Failure With Reduced Ejection Fraction and Chronic Obstructive Pulmonary Disease

Background: Beta-blockers are guideline-recommended therapy for heart failure with reduced ejection fraction (HFrEF), but clinicians frequently withhold them in patients with chronic obstructive pulmonary disease (COPD) out of concern for bronchospasm and respiratory decompensation.

Methods: We performed a retrospective observational study using the TriNetX US Collaborative Network. Adults were included if they had systolic heart failure (left ventricular ejection fraction $\leq 40\%$) and coexisting COPD diagnosed between January 1, 2015, and December 31, 2024. The beta-blocker group included patients who received metoprolol or carvedilol within one year after meeting the heart failure and COPD criteria. The comparison group included patients with no record of either medication. Propensity score matching using 44 characteristics resulted in 3,098 patients in each cohort. Outcomes were assessed over one year using risk ratios.

Results: Death occurred in 17.7% of patients receiving a beta-blocker versus 22.8% of those who did not, corresponding to a 22.5% relative reduction in mortality (RR 0.775, 95% CI 0.701–0.856; $p < 0.001$). Beta-blocker use was linked to higher all-cause hospitalization (51.8% vs. 41.1%; RR 1.260; $p < 0.001$), COPD exacerbation (8.9% vs. 6.1%; RR 1.453; $p < 0.001$), noninvasive ventilation (8.5% vs. 4.5%; RR 1.886; $p < 0.001$), and mechanical ventilation (6.2% vs. 4.5%; RR 1.364; $p = 0.004$). There was no significant difference in three-point major adverse cardiovascular events (23.3% vs. 25.8%; RR 0.906; $p = 0.106$).

Conclusion: Among patients with reduced-ejection-fraction heart failure and COPD, metoprolol or carvedilol use was associated with lower one-year mortality but more hospitalizations, COPD exacerbations, and respiratory support requirements. These findings show an association and do not prove causation. Beta-blockers should not be withheld solely because of coexisting COPD, but patients may require closer respiratory monitoring, balancing the potential survival benefit against higher rates of respiratory events.

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Funding Sources: N/A

Abstract #3

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Scribing a New Rhythm: Ambient AI's Impact on Fellow Satisfaction and Documentation Time

Background: Documentation burden is a major contributor to burnout among cardiology fellows, and ambient artificial intelligence (AI) scribe technology has emerged as a potential solution to reduce time spent on the less desired aspect of cardiology, the clinic setting. This quality improvement (QI) project evaluated cardiology fellows before and after the implementation of ambient AI with focus on time spent on different aspects and overall satisfaction with clinic.

Methods: Cardiology fellows completed a pre-intervention quiz (n=12) assessing time spent writing notes for new-patient and follow-up visits and overall clinic satisfaction (5-point scale). Following implementation of an ambient AI scribe tool, fellows completed a post-intervention quiz (n=9) assessing the same measures, plus whether the AI scribe positively impacted the clinic.

Results: The proportion of fellows reporting under 10 minutes spent writing follow-up visit notes rose from 25% (3/12) pre-intervention to 89% (8/9) post-intervention. For new-patient visit notes, the proportion reporting more than 15 minutes fell from 67% (8/12) to 0%, while the proportion reporting under 10 minutes rose from 8% to 56%. Mean overall clinic satisfaction improved from 3.4/5 to 3.8/5, and 100% of fellows reported the AI scribe positively impacted the clinic.

Conclusion: Implementation of ambient AI scribe technology in a cardiology fellows' clinic was associated with substantial reductions in time spent writing both new-patient and follow-up visit notes, along with improved overall clinic satisfaction. These findings support broader adoption of AI-assisted documentation tools to reduce documentation burden and enhance trainee experience.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #4

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Robotic-Assisted Versus Conventional Aseptic Revision Total Knee Arthroplasty: A Multicenter Propensity-Matched Cohort Study

Background: Robotic-assisted revision total knee arthroplasty (rarTKA) has gained increasing interest as a potential adjunct for the management of failed total knee arthroplasty, given its capacity to improve implant positioning and restore anatomic parameters such as joint line position and posterior condylar offset (PCO). The purpose of this study was to compare clinical, radiographic, implant construct, and survivorship outcomes between conventional revision TKA (rTKA) and rarTKA performed for aseptic indications. **Methods:** This retrospective, multicenter cohort study included 186 patients (112 conventional rTKA and 74 rarTKA) who underwent aseptic revision TKA performed by three fellowship-trained arthroplasty surgeons at two high-volume academic institutions. Mean follow-up was 2.4 ± 1.8 years. The primary outcome was midterm knee range of motion (ROM), defined as the most recent postoperative measurement obtained at a minimum of six months postoperatively.

Results: The rarTKA group demonstrated greater midterm ROM than the conventional group ($120 \pm 8^\circ$ vs $114 \pm 12^\circ$, $p = 0.01$) and a greater change in PCO (2.3 ± 4.1 mm vs 1.0 ± 4.4 mm, $p = 0.04$). KOOS-JR scores at one year (62.3 ± 18.1 vs 60.0 ± 16.8 , $p = 0.50$) and two-year all-cause re-revision-free survival (95.0% vs 94.8%, $p = 0.70$) were comparable between groups.

Conclusion: In this propensity score-matched multicenter study, rarTKA was associated with greater midterm ROM and greater PCO change compared with conventional rTKA; however, the clinical significance of these findings remains uncertain, and larger prospective studies with extended follow-up are needed.

IRB or IACUC Approval Number: 2205529-2

Funding Sources: N/A

Abstract #5

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Native Posterior Tibial Slope Restoration Is Associated With Higher Forgotten Joint Scores: A Systematic Review and Meta-Analysis

Background: The optimal restoration of native posterior tibial slope (PTS) during primary total knee arthroplasty (TKA) remains controversial. While postoperative PTS influences knee biomechanics, the clinical importance of restoring a patient's native slope rather than achieving a predetermined postoperative angle remains unclear. This systematic review and meta-analysis evaluated whether restoration of native PTS is associated with improved patient-reported, functional, radiographic, and survivorship outcomes following primary TKA.

Methods: A systematic review was performed according to PRISMA guidelines and prospectively registered on PROSPERO (CRD1384697). PubMed/MEDLINE, Cochrane Library, SPORTDiscus, and ClinicalTrials.gov were searched through April 2026 for studies reporting both native/preoperative and postoperative PTS with postoperative clinical outcomes after primary TKA. Random-effects meta-analyses were performed using mean differences (MD). Primary outcomes included patient-reported outcome measures, range of motion (ROM), and implant survivorship. Heterogeneity was assessed using the I^2 statistic.

Results: Nineteen studies comprising 6,254 primary TKAs met the inclusion criteria. Restoration or lower deviation from native PTS was associated with significantly higher Forgotten Joint Scores compared with greater deviation from native anatomy (MD 0.29, 95% CI 0.05–0.52; $P=0.016$). No significant differences were observed for Knee Society Knee Score (MD 1.46, 95% CI –0.45 to 3.37; $P=0.134$), Knee Society Function Score (MD –0.20, 95% CI –1.07 to 0.67; $P=0.651$), WOMAC (MD 0.20, 95% CI –0.12 to 0.53; $P=0.223$), or postoperative ROM (MD 1.51°, 95% CI –0.46° to 3.48°; $P=0.134$). Available evidence likewise demonstrated no significant differences in implant survivorship according to restoration of native PTS, although these outcomes were infrequently reported. Between-study heterogeneity ranged from moderate to substantial across pooled analyses.

Conclusion: Restoration of native posterior tibial slope following primary TKA appears to improve patients' perception of their reconstructed knee, as reflected by higher Forgotten Joint Scores, but was not consistently associated with improvements in conventional functional scores, ROM, or implant survivorship. These findings suggest that reproducing native sagittal tibial anatomy may primarily influence joint awareness rather than traditional clinical outcome measures. Additional prospective studies with standardized definitions of posterior tibial slope restoration are needed.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #6

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Biportal Endoscopic versus Minimally Invasive Transforaminal Lumbar Interbody Fusion for Lumbar Degenerative Disease: A Systematic Review and Meta-Analysis

Purpose: To compare clinical outcomes and complication rates of biportal endoscopic transforaminal lumbar interbody fusion (BE-TLIF) and minimally invasive transforaminal lumbar interbody fusion (MIS-TLIF) for degenerative lumbar disease.

Methods: PubMed, Ovid MEDLINE, Web of Science, the Cochrane Library, and Google Scholar were searched for peer-reviewed comparative studies published through December 2025. Studies comparing BE-TLIF with MIS-TLIF were included. Methodological quality was assessed using the Newcastle–Ottawa Scale.

Results: Twenty-two studies comprising 1,841 patients were included. BE-TLIF and MIS-TLIF produced comparable outcomes for Oswestry Disability Index scores (SMD, -0.13; 95% CI, -0.28 to 0.03; P=0.08), leg pain (SMD, 0.10; 95% CI, -0.05 to 0.26; P=0.18), fusion rate (OR, 1.33; 95% CI, 0.95–1.85; P=0.09), and overall complications (OR, 0.92; 95% CI, 0.65–1.29; P=0.62). BE-TLIF was associated with greater improvement in back pain (SMD, -0.17; 95% CI, -0.32 to -0.02; P=0.02), shorter hospital stay (SMD, -0.53; 95% CI, -0.76 to -0.31; P<0.00001), and less intraoperative blood loss (SMD, -1.56; 95% CI, -2.05 to -1.06; P<0.00001).

Conclusions: BE-TLIF and MIS-TLIF provide comparable functional outcomes, fusion rates, and safety profiles. BE-TLIF may offer some advantages in back-pain improvement, blood loss, and hospital stay. Additional randomized controlled trials and prospective studies should evaluate operative outcomes, cost-effectiveness, and long-term recovery.

IRB or IACUC Approval Number: None

Funding Sources: None

Abstract #7

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Demographic Analysis of Occupational Medicine Visits for an Onsite Workplace Clinic

Introduction: Occupational medicine focuses on evaluation and treatment of injury, illness, and disability as related to the workforce. Onsite occupational medicine clinics may promote employee health by providing convenient access to healthcare. This study sought to characterize the most common types of visits seen during a four-month period.

Methods: A deidentified chart review was done for quality improvement purposes on 4 months of visits at an onsite occupational medicine and primary care office. Visits were analyzed by type (Illness, Injury, or Medical).

Results: A total of 229 visits were reviewed. Illnesses accounted for 134 (58.5%) visits, of which 79 (56.8%) are respiratory related. There were 47 (20.5%) injuries, with back (9; 19.1%), lower extremity (9; 19.1%), upper extremity (7; 14.9%), skin (4; 8.5%), and insects/arthropods (4; 8.5%) accounting for the highest percentages. Primary care visits accounted for 36 (15.7%) of the total, with 11 (30.6%) being for various mental health aspects.

Conclusion: The diversity of visits identified in this chart review suggests that the comprehensive training provided by family medicine is well suited to the delivery of occupational medicine services.

IRB or IACUC Approval Number: 2454328 (pending review)

Funding Sources: N/A

Abstract #8

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Periprosthetic Fractures in U.S. Emergency Departments: National Incidence Trends, Injury Mechanisms, and Predictors of Admission-Level Care (2019–2024)

Background: As total joint arthroplasty (TJA) volume rises, periprosthetic fractures remain an important complication, yet national trends and mechanism-specific causes are incompletely characterized. This study evaluated incidence, injury mechanisms, and predictors of hospital-level care for periprosthetic fractures presenting to U.S. emergency departments (EDs).

Methods: The National Electronic Injury Surveillance System was queried from 2019 to 2024 using a narrative-based keyword strategy. The primary cohort included clearly identified periprosthetic fractures. Weighted national estimates and incidence rates were calculated using U.S. Census data. Multivariable logistic regression identified predictors of admission, transfer, or observation-level care (ATO).

Results: A total of 373 cases met inclusion criteria, representing an estimated 17,992 cases nationally and a 2024 incidence of 1.87 per 100,000 persons. Mean age was 75.8 years, 66.2% were female, and the proximal femur was the most common location (61.7%). Most injuries followed low-energy mechanisms, including ground-level falls (46.0%, 95% CI 40.3–51.7) and bed-chair transfers (BCTs) (16.2%, 95% CI 12.1–20.2). Patients aged ≥80 years were more likely to sustain BCT-related fractures ($p < 0.001$). Overall, 83.9% required ATO. Transfer-related injury was not significantly associated with ATO in the strict cohort but was significant in the expanded sensitivity analysis (OR 2.45, 95% CI 1.07–6.62; $p = 0.05$). Shoulder/humerus fractures had lower odds of ATO (OR 0.11, 95% CI 0.03–0.32; $p < 0.001$).

Conclusion: Periprosthetic fractures presenting to U.S. EDs predominantly affected older adults after low-energy mechanisms and imposed a substantial national burden. BCT-related injuries may identify a vulnerable subgroup for targeted prevention and resource planning.

IRB or IACUC Approval Number: This was a national database study and does not require an IRB

Funding Sources: None

Abstract #9

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Machine Learning-Based Characterization of Genetic Influence on Addiction-Related Behaviors

Pavlovian conditioned approach (PCA) is a phenomenon in which mice or other organisms learn to approach a cue that predicts a reward. PCA is measured using a behavioral assay called sign-tracking/goal-tracking (STGT) in which a food reward is predicted by a cue (e.g., a light). Mice that learn to approach the reward are strongly motivated by the reward itself (goal-trackers), whereas mice that approach the cue are strongly motivated by the cue that predicts the reward (sign-trackers). Individuals that are strongly motivated by reward cues are vulnerable to relapse when exposed to stimuli that are associated with drug use. Critically, the genetic mechanisms underlying this phenomenon are unknown. Because drug addiction is highly heritable, determining the genetic underpinnings of sign-tracking behaviors may reveal genes that drive addiction relapse. To identify these mechanisms, we are integrating a genetically complex mouse panel, the Collaborative Cross (CC), and machine learning, a type of artificial intelligence, to characterize the genetically driven behavioral nuances of sign-tracking and goal-tracking behaviors. Relative to the classical approach of manual scoring by human observers, machine learning allows for the efficient, automated behavioral tracking of the large numbers of mice required for genetic discovery. If successful, this project will reveal genetic mechanisms underlying addiction relapse and contribute to the development of novel, more effective addiction treatments.

IRB or IACUC Approval Number: IACUC 833

Funding Sources: NIDA R01DA057931

Abstract #10

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Hypertension - Both Under and Over Treated

Hypertensive urgency refers to blood pressures (BP>180/120) without signs of end organ damage. Treatment for hypertensive urgency has been a controversial issue for physicians. Current guidelines discourage aggressive BP reduction and recommend outpatient management with oral medication. Despite these recommendations, treatment practices vary. This IRB approved retrospective review of adult inpatients discharged with a diagnosis code for hypertensive urgency (I16.0) were identified through the Charleston Area Medical Center's electronic database. Included patients had at least one systolic BP>180 or diastolic BP>120 between 12/31/23-6/29/26. Demographic characteristics, comorbidities, qualifying hypertensive episodes, acute hypertensive treatment, and discharge antihypertensive medication changes were collected. A total of 270 patients were included, contributing 901 qualifying BPs with 884 episodes having documented treatment. The cohort was 61.2% female and 81% white with a mean age of 65.3±15.2 and BMI of 32.4±9.8kg/m². History of hypertension was present in 84.6% of patients. Pharmacologic therapy was administered during 148 (16.7%) hypertensive episodes with 92 (62.2%) administered intravenously and 56 (37.8%) administered oral/sublingual. The most frequently administered medications were hydralazine (36.1%) and labetalol (32.7%). The other 736 (83.3%) were only observed. 189 (70.0%) patients had a home antihypertensive medication change at discharge, including additions, discontinuations, and dose changes. Modifications were frequently made but did not differ between patients who received acute hypertensive therapy and those managed with observation alone (68.5% vs 72.7%, p=0.45). These findings indicate most patients were not acutely treated for hypertensive urgency. However, long term antihypertensive regimen changes were often made during discharge.

IRB or IACUC Approval Number: 25-1203

Funding Sources: No Funding

Abstract #11

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Dupilumab Across Allergic Diseases: Indications, Clinical Efficacy, and Future Direction

Dupilumab is a human monoclonal antibody targeting the IL-4 receptor alpha subunit, thereby inhibiting both IL-4 and IL-13 signaling pathways central to type 2 inflammation. Since its initial approval for atopic dermatitis in 2017, dupilumab has gained multiple FDA-approved indications across allergic and eosinophilic diseases, including asthma, chronic rhinosinusitis with nasal polyps, eosinophilic esophagitis, prurigo nodularis, chronic spontaneous urticaria, chronic obstructive pulmonary disease with type 2 inflammation, bullous pemphigoid, and allergic fungal rhinosinusitis. This review summarizes the immunologic mechanisms, pharmacologic properties, clinical efficacy, biomarker effects, and safety profile of dupilumab across approved indications, while also discussing its role within the broader landscape of type 2 biologics. Landmark clinical trials consistently demonstrate significant reductions in disease severity, exacerbation frequency, corticosteroid dependence, and symptom burden, with improvements in quality of life across multiple organ systems. Biomarker studies show suppression of type 2 inflammatory mediators, including thymus activation-regulated chemokine (TARC), eotaxin-3, FeNO, and IgE, although eosinophil dynamics vary among diseases. Dupilumab has generally demonstrated a favorable long-term safety profile, with conjunctivitis and transient eosinophilia representing the most commonly recognized adverse events. Emerging evidence also supports potential roles in biomarker-guided precision therapy, disease modification, and combination biologic strategies. Given its efficacy across multiple indications and expanding indications, dupilumab has become an important therapeutic option for patients with overlapping type 2 inflammatory comorbidities and continues to reshape the management of allergic and eosinophilic diseases.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #12

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Abnormal mitochondrial fusion exacerbates age-associated pancreatic beta cell failure.

The prevalence of Type 2 diabetes mellitus (T2DM) has been shown to increase with age, but the mechanisms underlying this age-related risk are poorly understood. Mitochondrial dysfunction and cellular senescence are closely-connected mechanisms which contribute to the failure of insulin secreting pancreatic β -cells. However, it is not known if these mechanisms may contribute to the age-related risk of T2DM. Mitochondria undergo cycles of fission and fusion as a mechanism of self-renewal and repair, and abnormal cycling has been suggested as a hallmark of cellular aging. Opa1 is an inner-mitochondrial membrane protein which assists mitochondrial fusion, thereby maintaining normal function. We investigated the relationship between impaired mitochondrial fusion and cellular senescence in rat pancreatic β -cells, to determine if a mechanism exists linking the two processes in T2DM. Utilizing an in vitro Opa1 targeting adenovirus, we silenced Opa1 expression within rat β -cells exposed to diabetic conditions (glucolipotoxicity) and measured age-associated end points. Cellular senescence was measured by quantifying β -galactosidase activity. Western blotting was used to determine protein levels of cleaved caspase 3 and p53 to ascertain activation of senescence and apoptotic machinery. Additionally, RT-qPCR was performed to determine the mRNA expression of several senescence markers such as p21, p16, and p53, as well as other mitochondrial fusion proteins Mfn1 and Mfn2. Our data suggest that impaired mitochondrial fusion drives both senescence and apoptotic pathways in diabetic rat pancreatic β -cells. Future research will aim at investigating the therapeutic potential of targeting mitochondrial fusion to ameliorate age-associated determinants of β -cell failure and T2DM susceptibility.

IRB or IACUC Approval Number: No IRB or IACUC approval numbers needed.

Funding Sources: MUSOM Aging Research Pilot Study Grant.

Abstract #13

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Role of the IGFBP protease PAPP-A in diet enhanced bone elongation

Children who experience obesity exhibit increased growth rate and reach final adult height sooner than normal weight peers. Research from our laboratory based on both mouse (diet-induced obesity studies) and human data (longitudinal occurrence of overweight or obesity in elementary school) has shown that tall stature occurs prior to the onset of obesity, suggesting that rapid bone elongation could be a potential indicator of diet-induced obesity risk. The goal of our project is to identify pathways that underlie this growth enhancement that could be used as biomarkers of obesity risk in young children. Insulin-like growth factor-I (IGF-I) is the major hormone responsible for growth and is bound to inhibitory IGF binding proteins (IGFBPs) in the circulation. Pregnancy-associated plasma protein A (PAPP-A) is an enzyme that degrades IGFBP-4 and frees IGF-I for biological activity. Using a knockout mouse model of PAPP-A deficiency, we initially hypothesized that mice lacking the ability to degrade IGFBP-4 would fail to show the increased growth rate mediated by IGF-I when fed a high fat diet. Using bone length and growth plate histology data, our results instead show that PAPP-A knockout mice grow significantly more on a high-fat diet relative to wildtype mice. These results are relevant for understanding mechanisms of diet-induced growth acceleration and suggest that PAPP-A could be a promising biomarker of early obesity risk detection before excess weight gain, allowing earlier implementation of long-term obesity prevention strategies.

IRB or IACUC Approval Number

Funding Sources: The project was supported by resources from the National Institutes of Health through the WV-CTSI (NIGMS award 2U54GM104942), WV-INBRE (NIGMS award P20GM103434), Marshall University COBRE (NIGMS award P20GM121299), and NASA West Virginia Space Grant Consortium (80NSSC20M0055)

Abstract #14

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Pterostilbene Modulates Oxidative Stress and Autophagy-Associated Proteins in HK-2 Cells Under Oxidative Stress

Chemotherapeutic regimens are the cornerstone of treatment for cancer patients, though many chemotherapeutic drugs can cause nephrotoxicity, for which no antidote currently exists. Studies have demonstrated that the naturally occurring stilbene antioxidant pterostilbene confers cytoprotection against chemotherapy-induced oxidative renal damage. This study hypothesized that pterostilbene protected HK-2 cells from oxidative stress by modulating the expression of proteins involved in oxidative stress and the autophagy pathway. HK-2 cells were pretreated with chloroquine (autophagy flux inhibitor) with 0- 10 M pterostilbene. The cells were then co-incubated for 24 hours with H₂O₂. Upon completion of the 24-hour incubation period, the cells were collected, lysed, and prepared for Western blot analysis. All studies were performed with a minimum of 4 independent experiments across 4 different cell passages. Protein expression of NOX4 (oxidative stress marker), ATG7 (autophagosome initiation), and p62 (autophagy cargo handling) was measured and analyzed. Pterostilbene significantly decreased NOX4 expression during oxidative stress, though it did not significantly alter expression under basal conditions. ATG7 expression exhibited a nonsignificant trend toward increased expression with isolated pterostilbene treatment, but decreased under oxidative stress. Pterostilbene partially rescued p62 expression during oxidative stress. Collectively, these findings suggest that pterostilbene decreases NOX4 expression and may modulate autophagy markers in HK-2 cells, supporting a potentially protective role against oxidative stress in renal tubular epithelium. Further studies are needed to confirm these trends and elucidate a mechanism for the renal protection conferred by pterostilbene. Supported by NIH Grant P20GM103434 and NIH Grant U54GM104942-08.

IRB or IACUC Approval Number: N/A

Funding Sources: NIH Grant P20GM103434 and NIH Grant U54GM104942-08

Abstract #15

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Evaluating Operational Fidelity of a Rural Medical Respite Program for Patients Experiencing Homelessness: A Quality Improvement Initiative

Introduction: Medical respite programs aid recovery and reduce potential traumatic experiences for people experiencing homelessness, with or without co-occurring mental health and substance use disorders, who lack a safe destination for post-discharge care. Operating in lieu of prolonged inpatient hospitalization, medical respite programs deliver clinical care in a supervised environment as well as concurrent programming, such as social service linkage, that decreases emergency department readmissions and reduces the number of inpatient days, thereby reducing associated costs to the medical system. Currently, there are no models for medical respite in the state of West Virginia.

Methods: This quality improvement initiative aims to ensure that the medical respite facility operates with the highest level of fidelity across four core domains: clinical outcomes, operational sustainability, social determinants of health management, and patient satisfaction. During the operation of the site, separate interventions will be launched to track quality measures within the four domains. Clinical outcomes will be tracked via Cerner EHR chart abstraction. Financial sustainability will be tracked internally via Cabell Hunting Hospital's billing department and cross referenced with actuarial data. Social determinants of health markers will be measured with pre- and post-admission forms. Patient satisfaction will be an iterative process managed via a Lived Experienced Advisory Panel (LEAP) consulting model.

Results: Pending

Conclusion: The medical respite facility represents an opportunity to identify and mitigate barriers to successful operation thus assuring that the refined model can be efficiently replicated throughout West Virginia and other rural communities in the US.

IRB or IACUC Approval Number: None required, quality improvement research

Funding Sources: None

Abstract #16

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Revising the PHQ-9 to Quantify Depression Symptom Frequency

Background: The Patient Health Questionnaire-9 (PHQ-9) is widely used to screen for depressive symptoms but relies on qualitative frequency descriptors that may be interpreted differently among individuals with varying levels of health literacy, numeracy, and educational background. This study evaluated a revised PHQ-9 (PHQ-9-R) that replaces qualitative response descriptors with explicit numerical representations of symptom frequency.

Methods: This quality improvement study was conducted in an outpatient clinical setting. Participants completed both the conventional PHQ-9 and PHQ-9-R. Participants were randomly assigned to complete either the PHQ-9 or PHQ-9-R first to assess potential administration-order effects. The primary outcome was the within-participant difference in depression severity scores between the two instruments. Secondary analyses evaluated administration order and demographic factors. De-identified data were analyzed using comparative statistical methods and linear regression.

Results: Sixty-five participants completed both instruments. The mean age was 38.9 years (SD, 12.4), and 18 participants (27.7%) were male. There was no statistically significant difference in depression severity scores between the conventional PHQ-9 and PHQ-9-R ($p = 0.145$). Administration order did not significantly influence score differences ($p = 0.211$). Linear regression demonstrated a strong relationship between PHQ-9-R and conventional PHQ-9 scores, with each one-point increase in PHQ-9-R corresponding to an estimated 0.94-point increase in conventional PHQ-9 score ($\beta = 0.9416$; 95% CI, 0.8829–1.000). Age, gender, and administration order did not meaningfully alter this relationship.

Conclusion: The PHQ-9-R demonstrated strong agreement with the conventional PHQ-9 and produced comparable depression severity scores. Replacing qualitative response descriptors with explicit numerical values may preserve measurement performance while potentially improving accessibility. Larger studies directly evaluating health literacy, comprehension, and diagnostic accuracy are warranted.

Keywords: major depressive disorder; depression screening; Patient Health Questionnaire-9; PHQ-9; health literacy; quality improvement; mental health screening

IRB or IACUC Approval Number: 2420504-2

Funding Sources: N/A

Abstract #17

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Kaempferol Ameliorates Cytotoxicity Induced by Hydrogen Peroxide and Cisplatin in Noncancerous Human Proximal Tubule Cells.

Cisplatin is a platinum-based chemotherapy that has been found to induce acute kidney injury (AKI). Cisplatin primarily targets the mitochondria of proximal tubule cells, induces extensive DNA damage, and increases reactive oxygen species such as hydrogen peroxide (H₂O₂), leading to oxidative stress and cytotoxicity. Natural products have been identified as a potential solution to cisplatin-induced oxidative stress. Kaempferol is a natural product and a flavonoid found in leafy greens, legumes, and other plants. It has been shown to have antioxidant properties. This project tested the hypothesis that Kaempferol reduced cytotoxicity by preserving mitochondrial health. The cell model for these studies used HK-2 cells, which are a noncancerous proximal tubule epithelial cell line. HK-2 cells were plated, allowed to attach for 48hrs after which they were pretreated for 1hr with 0-20µM kaempferol, followed by a 24hr co-incubation of 0-1000 µM H₂O₂ or 0-50 µM cisplatin. An MTT cell viability assay was performed, and the 10µM and 20µM concentrations of kaempferol increased MTT values, suggesting improved mitochondrial health (p<0.05). MTT was similar to control when 10µM and 20µM kaempferol were coincubated with 500µM H₂O₂ and 30µM or 50µM cisplatin. Western blots were also performed to evaluate LC3B II/I ratio, uncleaved and cleaved caspase 3 as well as NADPH Oxidase 4 (NOX-4) following exposure to H₂O₂. In conclusion, kaempferol increased mitochondrial health and reduced cytotoxicity from H₂O₂ and cisplatin which suggests that kaempferol has the capability to protect against AKI and oxidative stress associated with cisplatin treatment.

IRB or IACUC Approval Number:

Funding Sources: Supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence and NIH Grant U54GM104942-08

Abstract #18

¹Burbelo, Alexander G., BS, ~¹Schmidt Jr., Christopher W., ¹Doyle, Robert A., BS, ¹Scarl, Nicholas, BS, ¹Clark, Trace, BS, ¹Eirich, Tyler, BS, ¹Stone, William, BS, ¹Caughran, Alexander, MD, ¹Bullock, Matthew, DO

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The Forgotten Outcome of Two-Stage Revision: Failure to Complete Reimplantation After Septic Revision TKA

Background: Failure to complete planned two-stage revision for periprosthetic joint infection (PJI) is an understudied outcome associated with substantial morbidity. Identifying factors associated with failure to progress to reimplantation may improve patient counseling and preoperative optimization.

Methods: We retrospectively reviewed 119 patients undergoing planned two-stage revision TKA for chronic PJI between 2013 and 2026. Patients who completed reimplantation were compared with those who failed to progress. Demographic, clinical, laboratory, and perioperative variables were evaluated. Multivariable Firth logistic regression identified factors independently associated with failure to complete reimplantation.

Results: Among 111 patients with definitive outcomes, 53 (47.7%) failed to complete reimplantation. The most common causes of noncompletion were chronic spacer retention (39.6%), death (17.0%), medical unfitness (15.1%), and amputation (15.1%). Noncompletion was associated with lower albumin, lower hemoglobin, higher ESR, intravenous drug use, and longer hospital stay on univariable analysis. In multivariable analysis, lower albumin remained independently associated with failure (OR 0.37, 95% CI 0.16–0.80, $p = 0.011$). Albumin demonstrated moderate discrimination (AUC 0.73), with an optimal cutoff of 3.25 g/dL.

Conclusions: Failure to complete planned two-stage revision was associated with impaired physiologic reserve, particularly hypoalbuminemia. Preoperative albumin assessment may help identify patients at increased risk for noncompletion and represents a potential target for preoperative optimization and patient counseling.

IRB or IACUC Approval Number: 2205529-2

Funding Sources: N/A

Abstract #19

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Leadership Gender & Resident Gender Representation in U.S. Integrated Plastic Surgery Programs: A National Cross-Sectional Analysis

Background: Women remain underrepresented in academic leadership despite a growing female trainee pipeline.

Methods: Cross-sectional analysis of all U.S. integrated plastic surgery programs (n=89) using publicly available data.

Results: No significant difference in female resident representation between programs led by female vs male chairs (52.0% vs 53.0%, $p = 0.783$). Chair gender was not an independent predictor of resident gender composition ($p = 0.927$).

Conclusion: Leadership gender alone does not independently influence gender composition.

IRB or IACUC Approval Number: No IRB required for this project

Funding Sources: N/A

Abstract #20

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Factors Contributing to Early Decision in Rural Residency Match

BACKGROUND: The National Resident Matching Program (NRMP) is the process used to match U.S. residency programs with incoming residents. The six-month Match process begins in September when senior medical students register and pay fees. Interviews are conducted from November to January, with program and student preferences (rank order lists) submitted in early March. Results are released in mid-March on Match Day.

The NRMP may issue rare exceptions to the NRMP All-In Policy to allow programs to offer residency positions outside of the Match (Early Decision). Exception examples granted include Rural Scholars Programs, Family Medicine Accelerated Programs, and Innovative Programs. Selected students must withdraw from Match participation.

To identify factors and incentives that would influence medical student participation in the Rural Scholars Program (Early Decision)

A total of 102 responses were collected (32.5% response rate) Most students indicated they would participate in a Rural Scholars Program offered in their specialty choice. The reduction of stress, specialty-specific Year 4 Curriculum, early assurance of a PGY1 position, and the right program fit ranked the highest as factors that would contribute to their decision to participate.

These results will assist Marshall's Rural Residency Programs with the development of a Rural Scholar Program for the Consortium's Rural Psychiatry and Rural Internal Medicine Residencies. The Consortium's Rural Surgery Residency Program was recently granted an NRMP exception for one position.

IRB or IACUC Approval Number: 2340077

Funding Sources: N/A

Abstract #21

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Magnetic Resonance Imaging in Patients With Spinal Cord Stimulation Systems: A Systematic Review of MRI Conditionality, Elevated Impedance, and Reported Adverse Events

Background: Spinal cord stimulation (SCS) is an established therapy for refractory chronic pain syndromes, yet many patients with implanted SCS systems later require magnetic resonance imaging (MRI) for neurologic, musculoskeletal, oncologic, or spine-related indications. Although most modern SCS systems are MR-conditional, MRI access may remain limited by device-specific restrictions, elevated impedance, inability to activate MRI mode, hardware failure, and uncertainty surrounding off-label scanning.

Objective: To summarize the available literature on MRI use in patients with implanted SCS systems, with emphasis on MRI conditionality, elevated impedance, off-label MRI exposure, MRI-related adverse events, and practical monitoring considerations.

Methods: A PRISMA-style screening process was performed using a PMC (PubMed Central) full-text search of published journal articles from 2015 through 2025 with the terms “spinal cord stimulation,” “MRI,” and “complications.” The search identified 1,024 records. After relevance screening, title review, abstract screening, full-text assessment, and exclusion of secondary/background articles, 10 studies were included in the qualitative synthesis. Data were extracted regarding study design, patient and scan characteristics, SCS device context, MRI conditions, adverse events, device malfunction, reprogramming, revision or explantation, and key conclusions.

Results: The included literature consisted primarily of retrospective reviews, case series, case reports, prospective feasibility data, and device-conditionality reviews. MRI need after SCS implantation was common, with claims-based estimates suggesting that 82% to 84% of patients may require at least one MRI within five years of implantation. Elevated impedance was a recurring barrier to MRI eligibility, with reported rates of impedance-related MR-conditionality loss ranging from 4.0% to 18.5%. In clinical MRI series, serious neurologic injury was not reported, including in off-label cohorts. Reported minor adverse events included heating, unintended stimulation, pain or numbness, inability to activate MRI mode, device interrogation or programming issues, and rare generator malfunction. In larger retrospective series, potentially implant-related event rates were generally below 10%, and most events were transient or resolved with device troubleshooting or reprogramming.

Conclusion: MRI in patients with SCS systems should be approached as an individualized device- and patient-specific risk-benefit decision rather than as a uniform contraindication. Future MRI access should be considered during SCS selection and preoperative counseling. When MRI is medically necessary, careful confirmation of the implanted system, review of manufacturer conditions, impedance and battery assessment, activation of MRI mode when available, awake patient monitoring, emergency stop access, and post-scan device interrogation may help preserve diagnostic access while minimizing risk.

IRB or IACUC Approval Number: None, as this is a systematic review.

Funding Sources: None.

Abstract #22

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A Comprehensive Pediatric Neuromodulation Program for Refractory Pain

Introduction: Refractory pediatric pain remains undertreated despite growing interest in neuromodulation. Access to neuromodulation is limited by fragmented referral pathways, inconsistent patient education, and complex insurance authorization processes. While spinal cord, dorsal root ganglion, and occipital nerve stimulation systems are established for adults, few pediatric centers have developed programs to support their implementation. This study describes the development of a structured pediatric neuromodulation program and provides implementation tools that may guide peer institutions.

Methods: We performed a structured review of our pediatric neuromodulation program to characterize its development and operational infrastructure. A supplementary retrospective chart review of cases from 2022-2025 was conducted to contextualize program implementation.

Results: Our program performed 33 neuromodulation procedures, including trials, in 18 pediatric and young adult patients with refractory chronic pain. Between 2024 and 2025, 13 patients were referred from five states. Fourteen patients encountered coverage denials requiring nine letters of medical necessity and seven formal appeals; 15% of submitted cases were ultimately not approved. We developed a four-pillar framework to support implementation: (1) a multidisciplinary, diagnosis-based referral algorithm; (2) standardized patient education materials; (3) structured insurance authorization recommendations; and (4) evidence dissemination strategies.

Conclusion: The expansion of our pediatric neuromodulation program reflects a critical gap in access to advanced pediatric chronic pain therapies. While educational resources and structured referral algorithms facilitated program growth, insurance authorization processes remain a significant barrier. We share implementation tools to support broader institutional adoption and promote collaborative advocacy efforts to improve pathways and equitable access for pediatric patients with refractory chronic pain.

IRB or IACUC Approval Number: STUDY00000232

Funding Sources: Pediatric Neurosurgery Division at Lurie Children's Hospital

Abstract #23

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NeuroAppalachia: Development and Implementation of a Rural Neuroscience Outreach Program

Background: Rural Appalachian communities face persistent educational and healthcare access barriers that may limit early exposure to health professions and contribute to workforce shortages. NeuroAppalachia was developed as a neuroscience-focused outreach curriculum utilizing hands-on learning and near-peer mentorship to introduce rural Appalachian high school students to neuroscience and healthcare careers.

Objective: To describe the implementation of a neuroscience outreach curriculum in rural Appalachian high schools and evaluate its feasibility, student engagement, and preliminary educational outcomes.

Methods: NeuroAppalachia was implemented across three rural West Virginia sites in Boone, Wayne, and Lincoln Counties. The curriculum included interactive neuroscience lectures, hands-on learning activities, sheep brain dissection, and near-peer mentorship by medical trainees. Students completed a 20-question neuroscience knowledge assessment before and after participation, along with a post-program survey evaluating engagement, satisfaction, career accessibility, and interest in continued neuroscience or healthcare-related learning.

Results: Ninety students participated across three rural Appalachian high school sites. Program implementation was successful across all locations, and student feedback was overwhelmingly favorable, with 14 of 15 survey items scoring above 3.5 on a 5-point scale. Students particularly valued hands-on learning activities and near-peer mentorship. Among students with complete matched assessments (n=63), neuroscience knowledge scores improved from 8.13 ± 2.2 to 11.3 ± 3.2 of 20 ($p=0.027$). Student written feedback demonstrated they particularly valued hands-on learning, including the sheep brain dissection, although interest in neuroscience-related careers remained modest.

Conclusion: NeuroAppalachia improved short-term neuroscience knowledge, received positive student feedback, and demonstrated the feasibility of delivering neuroscience-focused healthcare outreach in rural Appalachian high school settings. Future work should expand the program, incorporate longitudinal mentorship, and evaluate long-term educational and career outcomes.

IRB or IACUC Approval Number: 2390057-2

Funding Sources: Robert C. Byrd Rural Health Grant

Abstract #24

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Supersaturated Oxygen Therapy Following Primary Percutaneous Coronary Intervention for Anterior ST-Elevation Myocardial Infarction at an Appalachian Referral Center: A Single-Center Descriptive Case Series

Background. Supersaturated oxygen (SSO₂) therapy is a hyperoxemic intracoronary infusion after primary percutaneous coronary intervention (PCI) for anterior ST-elevation myocardial infarction (STEMI) to limit infarct size and preserve left ventricular (LV) function. Pivotal trials enrolled selected patients reperfused within six hours without cardiogenic shock. Real-world SSO₂ use in rural, transfer-dependent Appalachian settings, and beyond pivotal-trial criteria, has not been described.

Methods. We conducted a retrospective, single-center descriptive case series of consecutive patients with anterior or LAD-territory STEMI who received SSO₂ after primary PCI at an Appalachian referral center between November 2024 and January 2026. LVEF was assessed by echocardiography. Symptom-onset-to-reperfusion was mapped to the six-hour pivotal-trial window using documented onset or EMS dispatch as a surrogate. Analysis was descriptive.

Results. Nine patients were included (median age 68 years, range 38–76; six men). All had LAD culprit lesions, received drug-eluting stents, and completed a 60-minute infusion. Four patients would likely have met pivotal-trial criteria; the remaining five had beyond-criteria features including cardiogenic shock, mechanical support, stent thrombosis, in-stent occlusion, or multivessel disease. Reperfusion occurred within six hours in six of nine patients. LVEF trajectories were heterogeneous: four patients improved or recovered, one remained preserved, three declined (one with adverse remodeling), and one died in-hospital.

Conclusions. In this small real-world Appalachian series, SSO₂ was applied to a clinically heterogeneous, higher-risk population than in pivotal trials, with variable LV outcomes. These findings describe SSO₂'s feasibility in a transfer-based rural STEMI system and are hypothesis-generating, underscoring the need for larger prospective data.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #25

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Enhancing Lung Cancer Screening Rates: Indirect Impacts of a QI Project

Lung cancer is the leading cause of cancer-related death worldwide and is often diagnosed in later stages. Early detection through low-dose computed tomography (LDCT) decreases mortality among high-risk patients but is simultaneously underutilized. This QI initiative aims to improve lung cancer screening rates among eligible patients by instituting multiple interventions within the Marshall Health Network. Lung cancer screening rates were collected from HealtheRegistries on the first Monday of each month over a 28-month period from April 2024 to July 2026. Screening was evaluated via a run chart statistical process control methodology. "Runs" indicated 6 consecutive data points moving in the same direction. "Shifts" were calculated via Taylor Change Point Analysis; "Outliers" occurred only outside the 95% confidence interval. Interventions included understanding the metrics, automating data collection protocols, publicizing overall rates, improving provider attribution, and scheduling delinquent patient visits. During this period, screening rates improved from 13.1% to 27.0% with significant findings of Runs from April 2024 to January 2025 and January 2026 to July 2026; Shifts in September 2024, July 2025, and May 2026; and Low Outlier scores from April 2024 to October 2024 coupled with High Outlier scores from October 2025 to July 2026. Interestingly, none of the interventions during the study period were directed specifically to Lung Cancer Screening. Rather these interventions were attempts to mitigate identified process barriers common to multiple quality metrics. Future research will aim to determine if further improvement can be obtained through targeted Lung Cancer Screening interventions.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #26

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Spreading Awareness About Awareness: A Quality Improvement Initiative for Anesthesia Low-Pressure Leak Testing

Mandated by the ASA and FDA, daily pre-anesthetic low-pressure leak testing is critical to confirm circuit integrity, prevent hypoxia, prevent awareness under anesthesia (LUD), and mitigate exposure to waste anesthetic gases. A baseline audit in November 2025 at Cabell Huntington Hospital revealed an alarming lapse: checks had not been performed since January and February 2025, driven by equipment shortages necessary to perform the check where only nine out of nineteen ORs possessed the device; 7 of which were broken.

To address this safety vulnerability, an initiative was launched supplying fully functional squeeze bulb to every OR and educational flyers detailing protocols and clinical hazards. A follow-up audit was conducted on Friday, August 21, 2026, evaluating machine logs across 19 operating rooms.

While true daily compliance was not achieved, the audit revealed improved testing frequency. Specifically, 2 machines had been checked within the last two months (July 13 and July 31, 2026) representing the best compliance, while 11 machines had not been checked since January 2026. Overall compliance remains poor despite this positive behavioral trend. These findings indicate that while positive behavioral momentum is building, additional targeted interventions and workflow reinforcements are urgently needed to achieve complete, near-100% daily compliance.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #27

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A Prospective Randomized Trial Evaluating Suzetrigine as Part of an Opioid-Sparing ERAS Protocol for Postoperative Pain Control in Gynecological Oncology Surgery

Background: Enhanced Recovery After Surgery (ERAS) protocols emphasize multimodal, opioid-sparing analgesia following gynecologic surgery; however, postoperative opioid use remains substantial, particularly in Appalachia, where opioid-related morbidity continues to exceed national averages. Suzetrigine, a newly FDA-approved, non-opioid selective NaV1.8 pain signal inhibitor, has demonstrated effective analgesia without the respiratory depression or addiction potential associated with opioids. Its role in gynecologic oncology surgery has not yet been evaluated.

Methods: This prospective, randomized controlled trial will enroll patients undergoing elective minimally invasive gynecologic oncology surgery at Cabell Huntington Hospital. Participants will be randomized in a 1:1 ratio to receive either standard ERAS perioperative analgesia or standard ERAS supplemented with preoperative suzetrigine. Baseline demographic and clinical characteristics will be collected prior to surgery. Primary outcomes include postoperative opioid consumption, measured as morphine milligram equivalents (MME), and postoperative pain scores. Secondary outcomes include postoperative nausea and vomiting, time to ambulation, tolerance of oral intake, length of hospital stay, discharge opioid prescribing, 14-day complications or readmissions, and patient-reported satisfaction with pain control.

Expected Results: We hypothesize that the addition of suzetrigine to an established ERAS protocol will reduce postoperative opioid requirements while maintaining or improving pain control and postoperative recovery without increasing adverse events.

Conclusions: This study will provide one of the first prospective evaluations of suzetrigine in gynecologic oncology surgery. If successful, incorporation of suzetrigine into ERAS pathways may represent an effective opioid-sparing strategy and improve perioperative pain management, particularly in regions disproportionately affected by the opioid epidemic.

IACUC Approval Number: 2395867-2

Funding Sources: N/A

Abstract #28

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Exploring Provider Opioid Prescribing Habits and Perceptions in a Single Pediatric Institution

Opioids are widely used to manage both acute and chronic pain and provide substantial relief for many patients. However, their use carries significant risks, including potentially fatal respiratory depression and the development of an opioid use disorder (OUD). These concerns are particularly relevant in pediatric populations where novice prescribing can lead to exposure to inappropriate opioid doses and types, especially combined opioids with Tylenol, where under- and overdosing is common and becomes a significant source for accidental ingestion and overdose. Although best practices recommend avoiding combination opioids in pediatric patients and co-prescribing rescue medications, such as naloxone when appropriate, it remains unclear to what extent providers at a single institution adhere to or support these recommendations.

To better understand and positively impact prescribing habits, a series of provider surveys and educational interventions were conducted. At various grand rounds and educational sessions, providers from an individual department completed a survey assessing their beliefs and practices regarding opioid prescription habits. Following this, an educational intervention focused on general pediatric opioid prescription habits and concurrent naloxone co-prescription was delivered. A post-survey was then administered to assess potential changes in beliefs.

These surveys were designed to elucidate providers' beliefs, differences between departments, and the efficacy of the educational intervention. Data collection and analysis are still underway. Future investigations involve 6-month post-intervention surveys to assess long-standing changes in beliefs, and a chart review comparing changes in prescription habits against historical trends within the same departments and institution.

IRB or IACUC Approval Number: 2458944-1

Funding Sources: N/A

Abstract #29

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Medial Habenula Expression of GABRA1 and GABRA2 in Mouse-Model Cocaine IVSA

Relapse is a frequent occurrence affecting recovery from substance use disorder, yet the molecular mechanisms underlying this phenomenon are not well-understood. Previous research indicates that the medial habenula, a small brain structure densely populated with cholinergic neurons, plays a critical role in relapse vulnerability through its regulation of reward-related behaviors. While medial habenula activity changes little during acquisition or extinction, it increases during reinstatement, suggesting that this region plays a unique role in relapse. Understanding the molecular mechanisms within the medial habenula may reveal novel strategies for preventing relapse. The NR4A2 gene is highly expressed in the medial habenula. Previously, mice expressing a dominant-negative form of NR4A2 exhibited reduced relapse behavior. Single nucleus RNA sequencing of these mice after relapse revealed changes in the expression of GABA receptor subunit genes. We hypothesize that reinstatement is associated with altered GABRA1 and GABRA2 protein expression in this region. This study is designed to evaluate the expression of GABRA1 and GABRA2 at various timepoints in a mouse-model of cocaine intravenous self-administration. Adult mice are undergoing jugular vein catheterization, followed by acquisition, extinction, and reinstatement phases of drug seeking. Tissue is collected from the medial habenula at various time points and analyzed by western blot. The study provides insight into the intersection of cocaine seeking behavior and GABA receptor expression in the medial habenula, potentially identifying crucial time points and biological underpinnings for the prevention of relapse in substance use disorder.

IRB or IACUC Approval Number: 2384994-2

Funding Sources: MURC Startup Funds

Abstract #30

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Massive Transfusion Protocol Blood Product Utilization: A Quality Assessment

Introduction: Massive transfusion protocols (MTPs) facilitate rapid delivery of blood products in predetermined ratios for life-threatening hemorrhage. Because products are issued before the full transfusion requirement is known, MTP activation may result in blood components being returned unused or wasted. Given limited blood product availability and finite shelf life, understanding product disposition is important for optimizing MTP processes. This quality assessment evaluated MTP blood product utilization and wastage at Cabell Huntington Hospital to identify opportunities for quality improvement.

Methods: This retrospective quality assessment reviewed all MTP activations at a single institution from January 2025 to June 2026, using blood bank documentation completed after each activation. Activations using whole blood or cold-stored plasma lacked component-level tracking and were excluded. Utilization, wastage, and return rates were calculated overall and by individual product. Descriptive statistics summarized product disposition, and findings were used to identify documentation gaps and standardization opportunities.

Results: 70 MTP activations were identified from January 2025 through June 2026. 3 used whole blood without component-level documentation, leaving 67 with component level data. Across these, 968 products were issued, 705 (72.8%) transfused, 119 (12.3%) returned unused, and 144 (14.9%) wasted. Wastage was highest for platelets (19.3%), then cryoprecipitate (16.9%), red blood cells (14.8%), and fresh frozen plasma (12.6%).

Conclusion: This assessment found that a substantial portion of MTP blood products were never transfused, with 12.3% returned unused to the blood bank and 14.9% wasted. Documentation review revealed inconsistent recording of product disposition, and whole blood and cold-stored plasma had no dedicated tracking, resulting in gaps that likely distort true wastage estimates and limit reliable monitoring. Standardizing MTP documentation with explicit disposition fields for every product type would support education, improve waste quantification, and establish a baseline for ongoing quality improvement.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #31

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Drug-Induced Gut Dysbiosis and Metabolic Exhaustion Drive Neurobehavioral Sensitivity: New Targets for Addiction Treatment

Understanding how drugs like alcohol, methamphetamine, and fentanyl disrupt the gut-brain axis resulting in bacterial imbalances, metabolic exhaustion, and heightened neurobehavioral sensitivity is crucial for developing addiction treatments. To model this, male Sprague Dawley rats transitioned from adolescent binge drinking (PND 30-71; Water or EtOH) to adult bottle choice (PND 72-366; Water or Sucrose or EtOH). Fecal samples were collected across 52 weeks. Long-term alcohol exposure suppressed oxygen-sensitive Bacteroidetes while boosting alcohol-tolerant Firmicutes (particularly Lactobacillus). Metabolomics revealed disrupted host-microbe co-metabolism, altering functional metabolites: pentose sugars (xylulose, xylose, xylitol), purine and pyrimidine building blocks (xanthine, uridine, uracil), nitrogenous waste (uric acid, urea), essential amino acids (valine), and histidine breakdown products (urocanic acid). Across exposure stages, gut stress and neuro-enteric metabolite activity at Week 6 (elevated spermidine, cadaverine, GABA, and adenosine) turned into systemic inflammation and neuro-enteric metabolic dysfunction by Week 12 (elevated arachidonic acid and N-acetylaspartic acid). Following a Week 14 sucrose challenge shifting energy use toward double-sugars (maltose, maltotriose) while slowing amino acid oxidation (downregulated glutaric acid) and depleting neurotransmitter precursors (glutamate, tyrosine), bacterial imbalance by Week 52 culminated in secondary bile acid depletion (deoxycholic acid, isocholic acid). This progressive breakdown in molecular gut function destabilizes baseline body chemistry, potentially dictating sex-equivalent methamphetamine responsiveness and agitation thresholds. Addressing modern polysubstance exposure, future research will determine how chronic methamphetamine ± fentanyl reshapes the gut microbiome to drive agitation during naloxone overdose reversal, evaluate dexmedetomidine-naloxone to calm this response, and match human microbiome profiles with agitation severity to establish biomarkers for treatment.

IRB or IACUC Approval Number: IACUC Approval Number (Alcohol Work): VA IACUC #1782280. AUP 866 for METH sex equivalency data.

Funding Sources: Preliminary alcohol work was funded by the West Virginia Clinical and Translational Science Institute (Pilot Grant) 14207. Behavioral pharmacology work concerning Dickess et al. (2026) was funded by a NASA WV EPSCoR Research Seed Grant.

Abstract #32

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Substance Use Disorders in State Psychiatric Hospital Admissions: Patterns from an Appalachian Population

Background: West Virginia has among the nation's highest substance use disorder (SUD) mortality rates and has been an epicenter of the opioid crisis. Despite the high prevalence of SUD among psychiatric inpatients, little is known about SUD among committed state hospital populations. Mildred Mitchell Bateman Hospital (MMBH) exclusively serves involuntarily committed psychiatric patients.

Method: We examined 2023 discharge data from MMBH to determine the prevalence and types of SUD, psychiatric diagnoses, and associated demographic variables. We also assessed variables associated with SUD and psychiatric illness in this population.

Results: Diagnostic data from 397 patients with and without SUD were examined. Of these, 249 patients had at least one SUD diagnosis, representing 63% of the total population. Stimulant use disorder was the most common SUD (n=152, 38%), followed by cannabis use (n=121, 30%) and opioid use (n=106, 27%). Non-SUD diagnoses were present in 67 patients (27%). There were no significant differences between SUD and non-SUD groups by gender (chi-square p=0.22) or psychiatric diagnoses (chi-square p=0.6). The only significant difference was that the SUD group was significantly more likely to have capacity (chi-square p<0.01).

Conclusion: These findings highlight the significant prevalence of SUD among committed patients in an Appalachian state hospital and support the need for appropriate, robust SUD treatment during psychiatric admission. The overlap between psychiatric symptoms attributable to SUD versus primary psychiatric disorders is also relevant. The increased likelihood of capacity among patients with SUD is notable, as these patients may be more likely to benefit from co-occurring disorder (COD) groups.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #33

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Faith as a Barrier and a Bridge: Breast, Cervical, and Colorectal Cancer Screening Among Muslim Women in the United States

Introduction: Early cancer detection improves outcomes, yet Muslim women in the U.S. may face distinct barriers to breast, cervical, and colorectal screening. These barriers reflect healthcare access, language, cultural norms, gender preferences, family dynamics, and religious beliefs. Faith may function as either a barrier or facilitator. We aimed to synthesize barriers, facilitators, and interventions influencing cancer screening among Muslim women in the U.S.

Methods: We conducted a PRISMA-ScR-guided scoping review of 44 U.S.-based publications examining breast, cervical, and/or colorectal cancer screening among Muslim women. Data were extracted on study characteristics, screening behavior, barriers, facilitators, and interventions. Findings were synthesized across individual, interpersonal, religious/cultural, healthcare-system, and structural domains, with related publications linked to account for overlapping populations.

Results: Screening was shaped by multiple interacting factors rather than religion alone. Common barriers included limited knowledge, modesty and privacy concerns, fatalistic beliefs, preference for female clinicians, language barriers, fear or embarrassment, and limited access. Facilitators included clinician recommendation, family or spousal support, gender-concordant care, health knowledge, and trusted faith or community networks. Faith had a bidirectional role: fatalistic interpretations sometimes discouraged screening, while stewardship beliefs, imam involvement, and faith-based messaging promoted it. Tailored interventions generally improved knowledge, intention, and sometimes screening uptake.

Discussion: Cancer screening disparities among Muslim women reflect modifiable multilevel barriers. Culturally responsive care, strong provider recommendation, language-concordant services, female clinicians, and community partnerships may improve screening. Future research should prioritize colorectal screening and evaluate sustained, guideline-recommended screening in diverse Muslim populations.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #34

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The Glucagon-like Peptide-1 Receptor Agonist Era and Its Influence on Body-Contouring Referrals After Weight Loss in Appalachia

Background: Obesity remains a major public health concern in the U.S, increasing demand for body-contouring procedures following significant weight loss. Glucagon-like peptide-1 receptor agonists have transformed obesity treatment, creating a growing population of patients seeking reconstructive surgery. Appalachia, a region with high obesity rates and limited healthcare access, provides a unique setting to evaluate evolving referral patterns.

Methods: A retrospective review was performed of patients referred for post-weight-loss body contouring between October 2022-November 2024 at a tertiary referral center serving Appalachia. Patients were grouped by primary weight-loss method: lifestyle modification, GLP-1 RA therapy, or bariatric surgery. Referral trends were analyzed across four consecutive 6-month intervals using χ^2 testing and linear regression. Differences in age and BMI were assessed using one-way analysis of variance and Kruskal-Wallis testing.

Results: A total of 134 patients met inclusion criteria. Lifestyle modification accounted for 67 referrals (50.0%), followed by bariatric surgery (49, 36.6%) and GLP-1 RA therapy (23, 17.2%). Semaglutide was the most used GLP-1 RA (78.3%), and sleeve gastrectomy was the most common bariatric procedure (73.5%). Age and BMI did not differ significantly between groups, although pharmacotherapy patients tended to be older. Referral volumes increased across all pathways, with GLP-1-associated referrals demonstrating a positive but nonsignificant trend (slope = 2.7 patients/interval; $R^2 = 0.75$; $P = 0.14$).

Conclusions: Lifestyle modification remains the primary referral pathway for post-weight-loss body contouring in Appalachia. However, referrals following GLP-1 RA therapy are increasing and may soon rival traditional sources, reflecting evolving obesity management strategies.

IRB or IACUC Approval Number: 2217209-2

Funding Sources: N/A

Abstract #35

¹Rahimpour, Armein ¹Yokota, Yumi, ¹Wagner, Ian, ¹Ratliff, Alya, ¹Edah, Elizabeth, ~¹Stuart, Isabella, ¹Weaver, Andrew, ¹Bown, Paul, ¹Barry, Rahman

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Impact of Resident and Physician Assistant Participation on Cosmetic Plastic Surgery Outcomes in an Appalachia Population

Background: The integration of residents and physician assistants (PAs) into cosmetic plastic surgery has become increasingly common to address workforce shortages and maintain educational opportunities.

However, questions remain about their impact on operative efficiency and outcomes.

Methods: A retrospective review was conducted of 78 cosmetic surgery cases performed at an academic medical center between October 2022 and October 2024. Cases included abdominoplasty, breast augmentation/mastopexy, abdominoplasty combined with breast augmentation/mastopexy, breast augmentation mammoplasty, and reduction mammoplasty. Patients were stratified by team composition: attending surgeon alone, attending surgeon with a resident, attending surgeon with a PA, and attending surgeon with both a resident and a PA. Operative time, estimated blood loss (EBL), and complications were compared using analysis of variance and descriptive statistics.

Results: No significant differences in overall operative time or EBL were observed across team compositions ($P > 0.05$). However, when analyzed by procedure type, significant findings emerged. In abdominoplasty combined with breast augmentation/mastopexy, solo cases had significantly longer operative times compared with assisted groups ($P = 0.017$). In breast augmentation mammoplasty, resident participation was associated with the lowest mean EBL ($P = 0.026$). Only 2 complications occurred in the entire cohort (2.6%), with no difference across groups.

Conclusions: Resident and PA participation in cosmetic plastic surgery does not compromise patient safety or outcomes. These findings support the inclusion of residents and PAs in aesthetic procedures as both feasible and beneficial, balancing education with high-quality patient care.

IRB or IACUC Approval Number: 2255172-1

Funding Sources: N/A

Abstract #36

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Examining Barriers to Care in Patients with Cirrhosis

Background: Patients with cirrhosis can face numerous challenges in accessing and utilizing healthcare. Addressing barriers to care can improve health outcomes and quality of life. This study assessed potential barriers to care for patients with cirrhosis.

Methods: We invited, by phone, patients referred to a Charleston Area Medical Center gastroenterology clinic for cirrhosis to answer a survey assessing 19 barriers to care (CAMCIRB#26-1407). Data was examined using descriptive statistics, and T-test or Fisher Exact analysis was used to compare differences in the number of reported barriers (>5 barriers vs. ≤ 4) by patient characteristics.

Results: Of 214 people contacted by telephone, 89 (28%) no contact, 77 (36%) declined, and 48 (22%) completed the survey. The most common reported barriers included: being dependent on others for transportation (42%), long wait times for appointments (29%), doctors not coordinating with each other (23%), and having other health problems that make it difficult to see the doctor (21%). A total of 40 of 48 patients reported experiencing one or more barriers and 9 (19%) reported ≥ 5 barriers. Having ≥ 5 barriers significantly associated with Medicaid insurance ($p=0.01$), being of younger age ($p<0.001$), or missing an appointment during the study window period ($p=0.02$), while having Medicare was associated with ≤ 4 reported barriers

Conclusion: People living with cirrhosis in West Virginia report frequent barriers in accessing and engaging in healthcare. Addressing these barriers should improve health outcomes and quality of life for people with cirrhosis.

IRB or IACUC Approval Number: IRB# 26-1407

Funding Sources: WVCTSI

Abstract #37

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Integration of an Artificial Intelligence cognitive assessment platform to promote earlier detection of mild cognitive impairment and early dementia.

Alzheimer's disease and related dementias (ADRD) are leading causes of disability among adults aged ≥65 years. Early identification of cognitive impairment facilitates timely treatment and may improve long-term outcomes. Although routine cognitive screening is recommended during Medicare Annual Wellness Visits (AWVs), traditional screening tools may be time-intensive and have limited sensitivity for mild cognitive impairment. This prospective quality improvement initiative evaluated the feasibility of integrating the FDA-approved Linus Health artificial intelligence (AI) cognitive screening platform into routine AWVs across three primary care clinics. Adults aged ≥65 years without a prior diagnosis of dementia or severe hearing impairment were eligible. Six hundred patients were randomized to undergo either traditional paper-and-pencil Mini-Cog screening or AI-based assessment, and 112 patients completing AI screening also completed post-screening satisfaction surveys. AI-based screening identified a significantly greater proportion of positive cognitive screens than standard screening (49.2% vs. 9.9%, $p < 0.001$). Because this was a screening study rather than a diagnostic study, the higher positive screen rate likely reflects increased sensitivity for identifying patients requiring further evaluation rather than confirmed cognitive impairment. AI screening was integrated into routine clinical workflows with minimal disruption. Patient perceptions remained neutral-to-positive, with willingness to recommend AI screening ($\bar{x} = 3.67$), trust in AI ($\bar{x} = 3.65$), and high ratings for physician explanation ($\bar{x} = 4.03$). Patient feedback identified opportunities for refinement, including speech recognition variability with regional Appalachian accents and potential underperformance of the AI clock-drawing assessment in patients with tremor. These findings support the feasibility of AI-assisted cognitive screening in primary care and warrant further evaluation of diagnostic accuracy, referral patterns, and long-term clinical outcomes.

IRB or IACUC Approval Number: 2283884-5

Funding Sources: The Institute for Healthcare Improvement and The John A. Hartford Foundation

Abstract #38

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Genome Wide Association Study Reveals Novel Genetic Variation Related to Changes in Telomerase Activity in *Arabidopsis thaliana*

Telomeres are conserved nucleoprotein structures positioned at the ends of Eukaryotic chromosomes. They are critical for maintaining genome stability, as well as the length of the telomeres being important for aging in humans. Due to the position of telomeres at the termini of linear chromosomes, extension of telomeric DNA is performed via a specialized telomerase complex rather than typical DNA replication machinery. Despite its importance in maintaining telomeres, specific studies investigating genetic regulation of telomerase are scarce. We have utilized several genetically diverse lines of the model plant *Arabidopsis thaliana* to perform a Genome Wide Association Study (GWAS) to identify single nucleotide polymorphisms (SNPs) associated with variation in telomerase activity – a first of its kind experimental approach studying telomerase activity variation on an organism level. As a result, we have identified genetic variation in a number of genes which are associated with changes in telomerase activity which are functionally conserved in humans and have important implications in human health. Current studies are underway to measure telomerase activity and telomere length in loss-of-function mutants to identify novel genes which are important for the regulation of telomerase and subsequent changes to telomere length.

IRB or IACUC Approval Number: No IRB or IACUC Required

Funding Sources: National Institutes of Health (R01 GM127402 to E.V.S.)

Abstract #39

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AI-Assisted Studying in Medical Education: Measurement Constraints in a Crossover Pilot

Background: Artificial intelligence (AI) is increasingly used by medical students, but evidence of its short-term educational effects remains limited and may be distorted by assessment difficulty, order effects, and ceiling effects.

Objective: To estimate the short-term performance difference between structured AI-assisted and No-AI studying and examine measurement constraints affecting interpretation.

Methods: In this prospective randomized within-subject crossover pilot, 15 first- and second-year medical students completed AI-assisted and No-AI study conditions in randomized order. Each condition was followed by a counterbalanced 10-item post-test using Form X or Y. Final restricted scoring excluded one invalid/miskeyed Form Y item and one untaught high-difficulty item. Because the scored forms then had unequal denominators, scores were expressed as percent correct and rescaled to 0–10. The primary outcome was the within-participant condition difference. Supporting analyses assessed period, sequence, item difficulty, form inequivalence, and ceiling effects.

Results: Mean performance was 8.48 after AI-assisted study and 8.20 after No-AI study, equivalent to 84.8% and 82.0% correct. The mean paired difference was 0.28 points, or 2.8 percentage points, favoring AI-assisted study but remaining imprecise and non-significant (95% CI, -0.54 to 1.11; Cohen's $d_z = 0.19$; $p = .475$). Exact sign and permutation tests were concordant. An exploratory item-level mixed model also favored AI-assisted study (OR = 1.34; 95% CI, 0.63–2.86; $p = .455$). Multiple very easy items, one invalid item, one untaught item, and form-difficulty differences restricted discrimination and produced substantial ceiling compression.

Conclusions: Structured AI-assisted studying was associated with a small, uncertain positive difference. The pilot's principal contribution is methodological: assessment quality, form equivalence, and repeated-exposure effects strongly constrained estimation of the intervention effect.

IRB or IACUC Approval Number: 2348317

Funding Sources: None

Abstract #40

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Acquisition of Drug-Seeking Behavior: Intravenous Self-Administration Behavior in Mice.

Substance Use Disorder (SUD) is a major public-health and economic crisis, costing the United States over \$700 billion annually, while claiming over 100,000 lives annually. Because effective pharmaceutical treatments for cocaine use disorder do not currently exist, basic intravenous self-administration (IVSA) research is currently the gold standard for studying operant drug-seeking behavior. We investigated how protocol variations influence the transition from casual to compulsive drug-seeking behaviors, testing the hypothesis that mice would exhibit increased drug-seeking behavior over time. To test this, subjects were evaluated under varying feeding conditions and cue-tone-light pairing protocols to measure operant responses and earned drug infusion rewards. We expect these findings to exhibit a powerful, learned operant association between the behavior and cocaine reward. Ultimately, this research provides crucial insights into how environmental factors and access to substances influence escalated drug-seeking behaviors to better model human addiction.

IRB or IACUC Approval Number: 2384994-2

Funding Sources: MURC Startup Funds

Abstract #41

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NeuroAppalachia: Using Neuroscience Education to Increase Healthcare Interest in Rural High Schools

NeuroAppalachia is a returning educational initiative designed to inspire high school students from rural West Virginia counties—including Boone, Lincoln, Wayne, Cabell, and Putnam—to pursue careers in healthcare, addressing the critical shortage of providers in these underserved communities. The program introduces students to neuroscience through a combination of interactive hybrid lessons and a hands-on sheep brain dissection, providing a tangible connection between brain function and careers in medicine. By focusing on rural communities with limited access to healthcare education and resources, NeuroAppalachia seeks to cultivate interest in a wide range of healthcare professions while establishing a sustainable, replicable model for engaging underrepresented student populations.

The one-week program combines daily lectures, interactive learning modules, and a sheep brain dissection to reinforce key neuroscience concepts through both didactic instruction and experiential learning. Program effectiveness is evaluated using pre- and post-program knowledge assessments, surveys, and student interviews to measure changes in neuroscience knowledge, engagement, and interest in pursuing healthcare careers.

To date, NeuroAppalachia has been successfully implemented at three rural Appalachian high schools, reaching more than 90 students. Participants completed a 20-question multiple-choice neuroscience assessment before and after the program, demonstrating an approximate 39% relative increase in knowledge from baseline. These findings suggest that NeuroAppalachia effectively enhances neuroscience understanding while fostering greater interest in healthcare careers among students in rural West Virginia.

IRB or IACUC Approval Number: #2390057-2

Funding Sources: Internal Funding through: Marshall University Center for Rural Health and the West Virginia Higher Education Policy Commission

Abstract #42

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Supplement Use, Health Literacy, and Information Sources Among Gym-Goers Across a Rural Appalachian Gradient: A Multi-Site Cross-Sectional Survey

Dietary supplement use is prevalent among individuals who engage in regular physical activity. The patterns of use, health literacy and sources of supplement information remain poorly understood, particularly in rural, underserved regions. With influences ranging from healthcare providers to social media, awareness of specific supplements and overall health literacy can vary widely. Hence, we aim to compare, for the first time, how dietary supplements use, health literacy, supplement knowledge and sources people rely on, differ among gym-goers from rural and urban regions in southern West Virginia (WV). A cross-sectional paper-based, anonymous survey (IRB#2452887) was conducted at four fitness facilities in southern WV (n, rural=102, urban=109) and gathered relevant information. Statistical analysis was performed by the translational bioinformatics team using a binomial/logistic generalized linear model (GLM) with Rural-Urban Commuting Area codes as the primary predictor to identify significant differences between the groups. Results showed that, among participants who reported using dietary supplements, protein was the most widely used, with health and wellness identified as the primary reason for supplementation. GLM analysis showed significant changes in various parameters according to rurality, including access to a primary care provider, supplement-specific knowledge, access gap for registered dietitians etc. Of note, a sex-specific pattern was observed in supplement knowledge in which rural women score significantly lower than urban women. This novel study will provide insights into supplement use behaviors, health literacy and information-seeking practices among gym-goers in southern WV. Findings may identify educational gaps and provide targeted interventions to promote safe, evidence-based dietary supplement use.

IRB or IACUC Approval Number: IRB#2452887

Funding Sources: N/A

Abstract #43

~¹Crank, Kadence, ¹Sangani, Darshan, ¹Muck, Tristan, ¹Coulter, Olivia, ^{1,2,3}Jones, Mika, ^{1,2,3}Sexton, Hannah, ^{1,2,3}Risher, Mary-Louise

¹Department of Biomedical Research, Marshall University

²Neurobiology Research Laboratory, Marshall University

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Bidirectional, Sex-Dependent Effects of Rosiglitazone on Astrocyte - Synapse Remodeling and Behavior Following Adolescent Binge Ethanol Exposure

Adolescent binge drinking can result in long-term behavioral dysregulation and increases the risk of developing an alcohol-use disorder. Using the adolescent intermittent ethanol (AIE) rat model, we previously demonstrated maladaptive changes in the contextual fear conditioning task that were associated with dorsal hippocampal (dHipp) astrocyte reactivity, aberrant astrocyte signaling, tripartite structural remodeling, and astrocyte and neuronal cellular stress. Additionally, we observed that Rosiglitazone (ROSI), a drug developed for type 2 diabetes, may be effective therapeutic for reducing neuron and astrocyte-associated oxidative stress. We hypothesize that ROSI administration is sufficient to rescue AIE-induced tripartite structural remodeling, and cognitive deficits in adulthood. On PND 24, male and female Sprague-Dawley rats underwent AIE or H₂O. Animals then received ROSI or Vehicle for 20 days. In adulthood, animals underwent behavioral testing or were euthanized for tissue collection for immunohistochemistry (IHC), stimulated emission depletion microscopy (STED), or confocal microscopy to evaluate tripartite proximity and markers of cellular stress. Results demonstrate that AIE heightened fear responding by ROSI administration. We observed a sex-dependent increase in peripheral astrocyte process (PAP) proximity to inhibitory synapses and loss of proximity at excitatory synapses in the dHipp that was rescued by ROSI administration. Future studies will investigate the region-specific effects of AIE and ROSI in other brain regions associated with fear regulation. These data suggest that Glitazone-based compounds may have promising therapeutic potential.

IRB or IACUC Approval Number: 806

Funding Sources: NSF WV-NFNT OIA-2242771 (PI: Rorrer, Research Lead: MLR), NIHP20GM103434, VA Merit BX005403 (PI: MLR)

Abstract #44

~¹Foltz, Kaitlyn*, ~¹Sitler, Emma*, ¹Flesher, Susan, ¹Preston, Deborah, ¹Plumley, Jodi, ¹Ray, Jacqueline,
¹Maddox, Chaundra,
¹Pediatrics, Marshall University

A Prospective Study to Reduce Screen Time in Pediatric Patients

In May 2024, the American Academy of Child and Adolescent Psychiatry reported that children ages 8-12 in the United States spend 4-6 hours a day using screens and teenagers spend up to 9 hours. Excessive screen time in children has been linked to detrimental effects in cognitive development, mental health, behavioral health, sleep, and obesity. This prospective study gathers data focusing on screen time in the local pediatric population (ages 0-4, before school age) to improve provider ability in guiding and educating parents concerning the effects of screen time during early childhood. An informational handout was built using guidelines set forth by the American Academy of Pediatrics. Caregivers of children eligible to participate in the study were given anonymous electronic surveys before and after receiving the handouts at the Pediatrician's office. Survey responses were collected and stored on Redcap. Analysis of the 44 pre intervention surveys and the 19 post intervention surveys demonstrated a decrease in daily reported screen usage following parent education. These preliminary results demonstrate a clinically significant benefit of the interventions used. Due to a small sample size, these findings are not statistically significant.

IRB or IACUC Approval Number: 2377034-1

Funding Sources: Pediatrics Department

Abstract #45

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N-Myc Downstream Regulated 1 (NDRG1) Stabilizes Retinoblastoma Protein in Clear Cell Renal Cell Carcinoma.

NDRG1 is a stress response protein that is increased in clear cell renal cell carcinoma (ccRCC) due to biallelic loss of the Von Hippel-Lindau Tumor Suppressor (VHL) gene. NDRG1 is also a scaffold protein that can stabilize DNA repair proteins. Retinoblastoma protein is a tumor suppressor that controls whether a cell decides to commit to DNA replication. The role of Rb in VHL-null cancer is unique, because instead of inhibiting proliferation, its primary function is to promote cancer cell viability. Given that Rb and NDRG1 are simultaneously increased in ccRCC, we hypothesized that NDRG1 stabilizes Rb protein in this cancer. To this end, human ccRCC 786-O cells were transiently transfected with control non-targeting short interfering RNA (siRNA) or two NDRG1 targeting siRNAs that target different regions of NDRG1 mRNA. The results showed that NDRG1 protein was reduced by 80% in response to the NDRG1 siRNAs. The decrease in NDRG1 protein was associated with an 80% decrease in total Rb protein, and a 60% decrease in pRb (Ser780), and no change in Rb mRNA. This indicates that NDRG1 stabilizes Rb protein. We hypothesize that NDRG1 promotes the progression of ccRCC by stabilizing Rb, which promotes the viability of ccRCC cancer cells.

IRB or IACUC Approval Number: N/A

Funding Sources: EDWARDS FOUNDATION

Abstract #46

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Malignant Serous Cavity Effusions as the Initial Manifestation of Occult Malignancy: Clinicopathologic Features and Diagnostic Utility of Cytology

Introduction: Malignant serous cavity effusions (MSE) may represent the initial clinical manifestation of an otherwise occult malignancy. Cytologic evaluation is essential for diagnosis when invasive tissue biopsy is infeasible. This study aims to characterize the clinicopathologic features of MSE diagnosed by cytology in patients with previously undiagnosed malignancy.

Method: We performed a retrospective review of patients diagnosed with MSE at St. Mary's Medical Center between April 1, 2025, and April 30, 2026. Demographic, clinical, cytologic, ancillary study, molecular, and follow-up data were collected and analyzed descriptively.

Results: Thirty-one patients were identified, including 19 pleural (61.3%), 10 peritoneal (32.3%), and 2 pericardial (6.5%) effusions. The median age was 66 years (range, 33-87), and 74.2% were female. Cytologic diagnoses were positive for malignancy in 24 (77.4%), suspicious in 4 (12.9%), and atypical in 3 (9.7%) cases. Adenocarcinoma was the predominant tumor type (67.7%), with lung (51.6%) and Müllerian (16.1%) primaries representing most cases. All cases underwent ancillary immunohistochemical studies, with molecular testing performed when clinically indicated. Cytology with ancillary studies established the diagnosis without subsequent tissue biopsy in 18 patients (58.1%). At last follow-up, mortality was 61.3%. **Conclusion:** MSE may represent the initial manifestation of occult malignancy and are associated with poor clinical outcomes. Cytologic evaluation, combined with ancillary studies, established the diagnosis in a substantial proportion of patients without requiring subsequent tissue biopsy, highlighting the critical role of cytopathology in the rapid diagnosis and clinical management of these patients.

IRB or IACUC Approval Number: 2445506-1

Funding Sources: No funding was received for conducting this study.

Abstract #47

~¹Foltz, Kaitlyn*, ~¹Sitler, Emma*, ¹Flesher, Susan, ¹Preston, Deborah, ¹Plumley, Jodi, ¹Ray, Jacqueline,
¹Maddox, Chaundra,
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In May 2024, the American Academy of Child and Adolescent Psychiatry reported that children ages 8-12 in the United States spend 4-6 hours a day using screens and teenagers spend up to 9 hours. Excessive screen time in children has been linked to detrimental effects in cognitive development, mental health, behavioral health, sleep, and obesity. This prospective study gathers data focusing on screen time in the local pediatric population (ages 0-4, before school age) to improve provider ability in guiding and educating parents concerning the effects of screen time during early childhood. An informational handout was built using guidelines set forth by the American Academy of Pediatrics. Caregivers of children eligible to participate in the study were given anonymous electronic surveys before and after receiving the handouts at the Pediatrician's office. Survey responses were collected and stored on Redcap. Analysis of the 44 pre intervention surveys and the 19 post intervention surveys demonstrated a decrease in daily reported screen usage following parent education. These preliminary results demonstrate a clinically significant benefit of the interventions used. Due to a small sample size, these findings are not statistically significant.

IRB or IACUC Approval Number: 2377034-1

Funding Sources: Pediatrics Department

Abstract #48

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An Update on Functional Performance Outcome Measures After Total Knee Arthroplasty

Introduction: Functional recovery after total knee arthroplasty (TKA) extends beyond pain relief to include the restoration of mobility, strength, balance, and endurance. Patient-reported outcome measures (PROMs), although valuable, may not fully capture persistent functional limitations following TKA. Performance-based outcome measures (PBOM) provide objective, quantifiable assessments of functional capacity and offer complementary insight into postoperative recovery.

Methods: A contemporary review of current orthopedic and rehabilitation literature was conducted to identify the performance-based functional measures most commonly used after TKA. Evidence was synthesized with emphasis on measurement validity, responsiveness to change, recovery trajectories, and the clinical utility of these measures to inform both orthopedic surgeons and rehabilitation providers.

Results: PBOMs consistently detected residual deficits in mobility, strength, and balance following TKA, including impairments not identified by PROMs alone. Measures reviewed included the Stair Climb Test, 6-Minute Walk Test, Timed Up and Go, Chair-Stand tests, Single-Leg Balance Assessment, and Short Step Tests. Collectively, these assessments supported longitudinal assessment of functional recovery and demonstrated responsiveness to postoperative change over and rehabilitation interventions.

IRB or IACUC Approval Number: Not applicable. IRB and IACUC approval were not required because this study is a narrative literature review and did not involve human participants, identifiable patient data, or animal subjects.

Funding Sources: N/A

Abstract #49

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Shared Voices: An Educational Series on Power, Identity, and Equitable Care

Huntington, West Virginia, like many communities across the United States, faces persistent challenges related to health disparities and social inequities. Socioeconomic diversity, limited access to rural healthcare, and entrenched historical inequities collectively influence patient outcomes and experiences within the healthcare system. In such contexts, it is essential that healthcare professionals develop critical awareness of the ways in which unconscious bias, microaggressions, and structural inequities can impact both patient care and team dynamics. Shared Voices is a multi-session, interactive educational program designed for pediatric resident physicians, pediatric attending physicians, medical students, children's hospital nursing staff, and respiratory therapy to foster awareness within a multidisciplinary team. It provides structured opportunities for healthcare teams to engage in honest dialogue, guided reflection, and experiential learning. Through real-life case studies, personal storytelling, and small-group discussions, the series equips participants with the knowledge and tools to promote inclusive, respectful, and equitable care while also fostering open dialogue, reflection, and collaboration within the healthcare team. Particularly within pediatric clinical environments. This quality improvement project aims to assess the effectiveness of the newly developed Shared Voices curriculum using anonymous participant pre- and post-session surveys. The collected data will inform curriculum refinement and contribute to creating a clinical learning environment in which all individuals feel heard, valued, and supported.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #50

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¹Neonatology, MUSOM

²Medical Student, MUSOM

³Pediatrics, MUSOM

Optimizing Antibiotic Duration for Neonatal Early-Onset Sepsis (EOS) Rule-Outs in the NICU

Neonatal early-onset sepsis (EOS) presents a diagnostic challenge due to its subtle early signs, which may indicate serious bacterial infection (SBI). This uncertainty, paired with poor outcomes if left untreated/undiagnosed, leads to widespread sepsis workups and broad-spectrum antibiotic administration for all neonates with any suspicion of EOS. While the incidence of EOS is approximately 1.1 per 1,000 live births, antibiotics are administered at a much higher rate, with only 9% of evaluated cases confirming infection. The risk of missing an infection necessitates an abundance of caution, given the potential for severe outcomes, including mortality.

However, prolonged exposure to broad-spectrum antibiotics in neonates can have detrimental effects, including disruption of the gut microbiome, increased risk of necrotizing enterocolitis (NEC), invasive candidiasis, and late-onset sepsis. Therefore, optimizing antibiotic duration is essential to balancing the risks of overtreatment and undertreatment.

Traditionally, EOS rule-outs involve 48-hour antibiotic administration while awaiting culture results. However, advancements in culture technology and PCR-based diagnostics allow for pathogen identification within 24 hours. Several large academic centers have adopted a 24-hour rule-out protocol. Studies, including Sanchez et al., have demonstrated no increase in mortality or missed infections with a 24-hour protocol and have shown reduced likelihood of antibiotic re-initiation. A retrospective review of culture data from our NICU over the past five years also revealed no pathogenic bacterial growth beyond 24 hours.

IRB or IACUC Approval Number: 2300279

Funding Sources: None

Abstract #51

~¹Shrinivas, Krithika, ¹Copley, Jessica, ¹Queen, Kayla, ²Song, Jeffery.

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²Marshall Health Network

RuralHEART (Hypertension Education, Access, Risk Reduction, and Tracking in WV): A Longitudinal Community-Based Hypertension Prevention Model in Wayne County

Background: Hypertension remains a major contributor to cardiovascular morbidity, particularly in rural communities where access to preventive care and nutrition resources may be limited. RuralHEART is a pilot longitudinal hypertension and lifestyle intervention for adults with or at risk for hypertension in Wayne and Fort Gay, West Virginia.

Objective: To assess the feasibility and acceptability of a four month community based intervention and explore changes in hypertension knowledge, dietary behaviors, self-efficacy, and blood pressure over time.

Methods: Participants will be recruited through local clinical partners, community outreach, provider referrals, and flyers. Four monthly sessions will be delivered in trusted community settings by medical students and physician mentors. Each session will include blood pressure screening and tracking, hypertension education, and interactive nutrition instruction focused on sodium reduction and heart healthy food selection. Months 1 and 4 will include prerecorded low sodium cooking demonstrations, a DASH aligned meal, and Q&A sessions. Months 2 and 3 will reinforce practical dietary skills through label reading activities, portion planning, sodium substitutions, and meal preparation guidance. Transportation assistance and grocery gift cards will be provided to reduce participation barriers and support retention.

Results: Program implementation and participant recruitment are ongoing. Feasibility and acceptability will be evaluated through recruitment, attendance, retention, and engagement across sessions. Secondary outcomes will include changes in hypertension knowledge, dietary behaviors, self-efficacy, and blood pressure trends. This pilot may inform scalable, community based strategies for reducing cardiovascular risk in rural populations and increase medical student exposure to rural healthcare.

IRB or IACUC Approval Number: IRB review pending; no participant recruitment or data collection has begun.

Funding Sources: Department of Internal Medicine, Joan C. Edwards School of Medicine

Abstract #52

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Implementation of a Standardized Postoperative Corneal Abrasion Management Algorithm in the Cabell Huntington Hospital PACU

Background: Postoperative corneal abrasion is one of the most common ocular complications associated with general anesthesia. Although most cases resolve without permanent visual impairment, delayed recognition and inconsistent management can result in unnecessary patient discomfort, prolonged recovery, increased healthcare utilization, and variability in care. Implementing a standardized management protocol may improve timely recognition, treatment, and provider confidence while promoting more consistent patient care.

Objective: To develop and implement a standardized postoperative corneal abrasion management algorithm in the Cabell Huntington Hospital Post-Anesthesia Care Unit (PACU) and evaluate its impact on provider confidence, adherence to evidence-based practices, and consistency of postoperative corneal abrasion management.

Methods: This quality improvement initiative will utilize the Plan-Do-Study-Act (PDSA) framework to implement an evidence-based postoperative corneal abrasion management algorithm in the Cabell Huntington Hospital PACU. The algorithm will be introduced through brief provider education sessions and displayed in the PACU as a point-of-care reference. Provider knowledge, confidence, and perceived consistency of care will be assessed using pre- and post-implementation SurveyMonkey questionnaires. Following implementation, algorithm adherence, documentation quality, and management practices will be evaluated to assess the effectiveness of the intervention and identify opportunities for ongoing quality improvement.

Expected Outcomes: Implementation of a standardized postoperative corneal abrasion management algorithm is expected to improve provider confidence, increase adherence to evidence-based practices, reduce variability in patient management, and promote earlier recognition and treatment of postoperative corneal abrasions. Findings from this project may support broader adoption of standardized perioperative ocular care protocols across the institution.

IRB or IACUC Approval Number: IRB approval was not required for this quality improvement project.

Funding Sources: N/A

Abstract #53

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Association of Hypogammaglobulinemia with Infection & Mortality following CAR-T Therapy: A TriNetX Retrospective Cohort Analysis

Background: Chimeric antigen receptor T-cell (CAR-T) therapy can deplete non-malignant B cells. Hypogammaglobulinemia may result, which can increase infection risk. Data examining outcomes are limited, so we examined infection and survival among CAR-T recipients with hypogammaglobulinemia.

Methods: A retrospective study was done using the TriNetX Global Collaborative Network database. Adults (18-89) undergoing CAR-T therapy for malignancy from January 1, 2015 to the study end date were identified. ICD-10 codes identified patients with hypogammaglobulinemia. Propensity score matching adjusted for sex, race, hypertension, diabetes mellitus, and chronic respiratory disease. Pneumonia, sepsis, and mortality at 1 and 3 years were assessed.

Results: The hypogammaglobulinemia and non-hypogammaglobulinemia cohorts included 433 and 506 patients, respectively. After matching, both contained 242 patients each. At 1-year, the hypogammaglobulinemia group had higher pneumonia rates (15.1% vs 7.0%; RR 2.14, p=0.01). Sepsis rates were not significantly different. At 1-year, survival was lower for the hypogammaglobulinemia group, but not significant (83.8% vs 91.8%; HR 1.83, 95% CI 0.98 -- 3.42). At 3-years the hypogammaglobulinemia group had higher pneumonia (28.0% vs 11.5%; RR 2.44, p<0.001) and sepsis rates (18.1% vs 9.8%; RR 1.85, p=0.016). The hypogammaglobulinemia group had a greater 3-year survival (65.9% vs 42.4%; HR 0.42, 95% CI 0.32 -- 0.56; p<0.001).

Conclusions: Hypogammaglobulinemia following CAR-T therapy was associated with increased infectious complications but improved 3-year survival. Further studies should analyze the enhanced long-term survival.

IRB or IACUC Approval Number: No IRB or IACUC approval was required

Funding Sources: No funding was given

Abstract #54

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Comparative Effectiveness and Safety of Warfarin Vs Direct Oral Anticoagulants in Non-Valvular Atrial Fibrillation Patients Receiving GLP-1 Receptor Agonists

Objective: GLP-1 receptor agonists (GLP-1 RAs) are increasingly prescribed for non-valvular atrial fibrillation (AFib). However, GLP-1 RAs delay gastric emptying, promote weight loss, and alter gastrointestinal motility — pharmacokinetic effects that may destabilize warfarin's narrow therapeutic window. Conversely, direct oral anticoagulants (DOACs) have predictable pharmacokinetics. We compared patients undergoing warfarin vs DOAC treatment for the management of non-valvular AFib, while on concurrent GLP-1 RA medication.

Methods: We conducted a retrospective cohort study using the TriNetX network. Adults with non-valvular AFib and concurrent GLP-1 RA use were assigned to mutually exclusive cohorts: patients receiving warfarin versus patients receiving DOACs. After 1:1 propensity score matching (PSM), 4,031 patients remained in each cohort. Outcomes were evaluated at 6-month, 1-year, and 3-years. Primary outcomes were all-cause mortality and ischemic stroke. Secondary outcomes included systemic embolism and major bleeding.

Results: All-cause mortality was significantly lower with the DOAC cohort at 6 months (3.8% vs 6.1%; HR 1.60, 95% CI 1.30–1.96); 1 year (5.7% vs 9.5%; HR 1.63, 95% CI 1.38–1.92); and 3 years (11.0% vs 16.7%; HR 1.42, 95% CI 1.26–1.60). Ischemic stroke, systemic embolism, and major bleeding rates were statistically comparable at all follow-up periods.

Conclusion: These findings demonstrate an association between DOACs and a lower all-cause mortality compared to warfarin in patients with non-valvular atrial fibrillation concurrently receiving GLP-1 receptor agonists. Further studies are needed to examine whether residual confounding or pharmacokinetics are playing a role.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #55

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Cytisine: A Partial Nicotinic Receptor Agonist and its Potential for Nicotine Cessation via a Vapor Formulation

Despite great strides by public health officials in reducing combustible cigarette use, tobacco use remains the leading cause of preventable death in the United States. Tobacco companies, however, continue to evolve their nicotine products. Over the past several decades, adolescent use has shifted away from traditional combustible cigarettes toward e-cigarettes and vapes. These products were initially promoted as safer alternatives to combustible cigarettes, but their abuse potential has become increasingly evident over the past 10 years. The introduction of JUUL and the use of various flavorants have contributed to increased vaping among younger generations. Although vapes may pose lower pulmonary and cancer risks than traditional cigarettes, the long-term effects of their use remain incompletely understood.

Efforts to address this issue are further limited by the nicotine cessation methods currently available to active users. Most approaches, including nicotine pouches, gum, and behavioral therapy, have success rates of approximately 10%. Varenicline, the most effective pharmacologic cessation method, has a success rate of approximately 14% and is FDA approved for nicotine dependence. In the current study, we investigated cytisine, a partial nicotinic receptor agonist, as a potential nicotine cessation treatment in a vapor formulation. Cytisine has been used in Europe for nicotine cessation for decades, but its complex titration schedule can limit patient adherence. Developing a vapor formulation may improve ease of use and support long-term cessation efforts. Our results show that cytisine has high brain penetration, attenuates nicotine self-administration, and modulates nicotine-triggered dopamine release in the nucleus accumbens core.

IRB or IACUC Approval Number: 664

Funding Sources: Henderson - NIDA Grants

Abstract #56

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Drug Induced Bullous Pemphigoid- A Review of Treatments

Background: Drug-induced bullous pemphigoid (DIBP) is an autoimmune subepidermal blistering disorder triggered by medications, including dipeptidyl peptidase-4 (DPP-4) inhibitors, programmed cell death protein-1 (PD-1)/programmed cell death ligand-1 (PD-L1) inhibitors, penicillins, and loop diuretics. Clinically and immunopathologically, DIBP resembles idiopathic bullous pemphigoid (BP). Early recognition and withdrawal of the offending medication are essential for disease control.

Objective: To review current evidence supporting the treatment of DIBP, with emphasis on corticosteroid-sparing therapies and emerging biologic agents.

Methods: A literature review of randomized controlled trials, clinical trials, and review articles evaluating treatment strategies applicable to DIBP was conducted.

Results: Because DIBP-specific trials remain limited, treatment recommendations are largely extrapolated from idiopathic BP. High-potency topical clobetasol demonstrated superior efficacy and safety compared with oral prednisone in extensive BP, resulting in higher one-year survival and fewer severe adverse events. The BLISTER trial showed that while prednisolone achieved faster initial disease control than doxycycline, doxycycline was associated with significantly fewer serious adverse events and comparable long-term relapse rates, supporting its use as a steroid-sparing alternative. The ADEPT trial demonstrated that dupilumab combined with corticosteroids significantly improved sustained remission, reduced disease severity and pruritus, and prolonged corticosteroid-free remission compared with placebo.

Conclusions: Prompt discontinuation of the causative medication remains the cornerstone of DIBP management. High-potency topical corticosteroids are preferred first-line therapy, while doxycycline and dupilumab offer effective steroid-sparing treatment options. Additional prospective studies specific to DIBP are needed to establish evidence-based management guidelines.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #57

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Epigenetic Patterns on Individual Versus Control Population with Substance Use Disorder

This observational, case-control pilot study aims to investigate the relationship between substance use disorder (SUD) burden and DNA methylation patterns. It is based on the rationale that SUD can leave “footprints” in those it affects that are measurable at the level of the genome.

To identify epigenetic signatures associated with SUD, participants undergo comprehensive phenotypic assessment, including collection of demographic, medical, and substance use history data, biometric measurements, and a 10 mL peripheral blood sample. Individuals with SUD are recruited from Marshall Health Network's PROACT program, and control participants are recruited from Marshall University Department of Family Medicine clinics. Blood specimens are processed for genome-wide DNA methylation profiling, extending previous work that linked altered CpG methylation in stress-response and immune-related genes, including NR3C1, to chronic stress and behavioral health outcomes.

This research may reveal novel epigenetic markers associated with SUD that correlate with one's ability to recover from this condition. This pilot study is designed to lay the groundwork for a future multi-site clinical trial that can be used to better understand, diagnose, and treat SUD populations based on more specific quantitative criteria. Furthermore, it will help to determine the feasibility to use one's epigenetic markers to optimize recovery therapeutic approaches and modulate them as an adjunct to current methods.

IRB or IACUC Approval Number: 2374532

Funding Sources: N/A

Abstract #58

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GeriNet: Interpretable AI for Early Detection of Cognitive Decline in West Virginia Older Adults

Aging-related cognitive decline and Alzheimer's disease (AD) are major and growing health challenges in West Virginia (WV) and the Appalachian region, where nearly 20% of residents are aged 65 years or older. Early detection remains difficult because current gold-standard diagnostic methods, such as amyloid/tau PET imaging and cerebrospinal fluid (CSF) testing, are invasive, expensive, and often unavailable in rural healthcare settings. Recent studies suggest that blood-based molecular markers, including DNA methylation and gene-expression profiles, can capture early biological changes associated with inflammation, immune aging, and neurodegeneration before clinical symptoms appear. However, no existing framework combines these complementary omics data with clinical electronic medical record (EMR) information using an interpretable artificial intelligence (AI) approach, nor has such a model been developed specifically for Appalachian populations.

To address this gap, we propose GeriNet, an interpretable multi-omics AI framework for the early detection of cognitive decline and dementia risk. GeriNet integrates blood DNA methylation, transcriptomic, and clinical EMR data using a graph-attention neural network (GAT) that models biologically meaningful relationships among CpGs, genes, and pathways. The framework will be trained and validated using large Alzheimer's disease cohorts and will classify individuals into early-onset AD (EOAD), late-onset AD (LOAD), mild cognitive impairment (MCI), or cognitively normal aging groups.

GeriNet represents the first framework to combine blood-based multi-omics data, interpretable graph-based AI, and EMR integration for dementia risk assessment in Appalachia. The project will generate clinically relevant biomarkers, provide a clinician-friendly decision-support dashboard, and establish foundational cyberinfrastructure for linking omics and healthcare data. Beyond AD, the framework can be expanded to other neurodegenerative diseases, including Parkinson's disease, multiple sclerosis, amyotrophic lateral sclerosis, and age-related macular degeneration.

IRB or IACUC Approval Number: 2422031

Funding Sources: Aging Research Pilot Grant through the Joan C. Edwards School of Medicine at Marshall University

Abstract #59

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WV Immunotherapy Response Explorer (WIRE): Interpretable AI for Predicting Immunotherapy Response in Appalachian Cancer Populations

Lung cancer remains a leading cause of cancer-related mortality in the United States, with an estimated 226,650 new cases and 124,730 deaths projected in 2025. These challenges are further exacerbated in underserved regions such as Appalachia, where disparities in access to precision oncology persist. Immune checkpoint inhibitors (ICIs) have significantly improved outcomes in several cancers, including non-small cell lung cancer (NSCLC); however, a substantial proportion of patients do not benefit and may experience unnecessary toxicity and cost. Current biomarkers, such as PD-L1 expression and tumor mutational burden (TMB), remain insufficient particularly for populations underrepresented in clinical studies.

To address this gap, we present the WV Immunotherapy Response Explorer (WIRE), an interpretable artificial intelligence framework designed to improve prediction of immunotherapy response in Appalachian cancer populations. WIRE integrates two complementary modeling approaches: IRnet-v2, a pathway-informed graph neural network for mechanistic prediction, and G2PDeep, a deep learning platform for multi-omics biomarker discovery. By combining tumor transcriptomic profiles with curated biological pathway knowledge, our framework enables both accurate prediction and biologically interpretable insights into treatment response.

We are constructing a regional pilot cohort through collaboration with the Edwards Comprehensive Cancer Center (ECCC) and Marshall Health Network (MHN), incorporating RNA-seq data and associated clinical variables, including immunotherapy history and established biomarkers. These data will be used to evaluate and refine predictive performance relative to standard clinical markers.

In addition, we are developing a secure, clinician-oriented web portal that translates model outputs into actionable insights, including patient-level response probabilities and key pathway drivers. This platform aims to bridge the gap between advanced AI modeling and real-world clinical decision-making.

Overall, WIRE provides a scalable and interpretable framework for precision immunotherapy, with a focus on improving outcomes and reducing disparities in underserved populations.

IRB or IACUC Approval Number: 2413884

Funding Sources: Edwards Foundation Cancer Research Fund

Abstract #60

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Development of an Immunohistochemistry protocol targeting Phospho-NDRG1 (Thr346) as a downstream Readout of mTORC2 Activity in early Clear Cell Renal Cell Carcinoma

Mechanistic target of rapamycin complex 2 (mTORC2) promotes cancer and is a potential therapeutic target. Our published data show that phosphorylation of N-myc downstream-regulated gene 1 (NDRG1) (Thr346 and Ser330) is a readout of mTORC2 activation in clear cell renal cell carcinoma (ccRCC). Based on these findings, the study's objective was to develop an immunohistochemistry (IHC) protocol to provide evidence that phospho-NDRG1 (Thr346) is a readout of mTORC2 in clinical ccRCC FFPE samples.

We developed the IHC protocol in FFPE slides of ccRCC (grades 1 and 2) and paired normal renal tissue from patient samples. FFPE slides were probed with antibodies specific to mTOR and Rictor (obligate subunit of mTORC2), total NDRG1, phospho-NDRG1 (Thr346 and Ser330). Slides were boiled in Tris-EDTA (pH 9.0) for antigen retrieval prior to primary antibody application. Primary antibodies were used at 1:200 or 1:500 and incubated with slides for 48 hours, followed by secondary antibody for an hour, then application of DAB chromogen, counterstaining with hematoxylin and imaging by EVOS microscopy.

Results show total NDRG1 and mTOR staining in ccRCC nucleus and cytoplasm and weak staining in normal renal tissue. Phospho-NDRG1 (Thr346) was robustly expressed in ccRCC tissue with stronger staining in grade 1 versus grade 2 and low expression in paired normal tissue. Total Rictor and phospho-NDRG1 (Ser330) require further protocol development. Collectively, strong staining for mTOR, total NDRG1 and phospho-NDRG1 (Thr346) is consistent with our hypothesis that phospho-NDRG1 (Thr346) could be a readout and an IHC biomarker of mTORC2 activity in ccRCC.

IRB or IACUC Approval Number: 112274

Funding Sources: Edwards Foundation

Abstract #61

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Intraoperative Hypotension and Short-Term Outcomes After Primary Total Hip Arthroplasty: A Retrospective Cohort Study

Aims: Intraoperative hypotension (IOH) has been associated with adverse outcomes in noncardiac surgery, but its effect during total hip arthroplasty (THA) remains unclear. This study aimed to investigate whether absolute (AIOH) or relative (RIOH) IOH is a risk factor for adverse short-term outcomes following primary THA.

Methods: A retrospective review of 394 THAs performed at a single academic institution between September 2020 and April 2025 was conducted. AIOH was defined as any intraoperative mean arterial pressure (MAP) <65 mmHg, and RIOH as a $\geq 20\%$ decrease from preoperative baseline MAP. Primary outcomes included all-cause 30- and 90-day readmissions and postoperative length of stay (LOS).

Multivariable logistic regression was used to identify predictors of readmission and LOS > 1 day.

Results: 112 patients (28.4%) experienced AIOH during their THA. Neither the presence nor duration of AIOH was associated with readmission or LOS. RIOH occurred in 74 patients (22.5%), and was not associated with readmission or LOS, but was associated with higher rates of reoperation within 90 days (12.2% vs 2.4%, $p = 0.001$). Estimated blood loss (EBL) independently predicted prolonged LOS across all models (OR 1.75 per 50 mL, 95% CI 1.33–2.31, $p < 0.001$).

Conclusion: AIOH was not associated with an increased risk of adverse short-term outcomes following primary THA when defined by a fixed MAP threshold. RIOH and intraoperative blood loss demonstrated stronger associations with postoperative complications, but these findings require further evaluation. This study supports a more individualized approach to hemodynamic monitoring in primary THA.

IRB or IACUC Approval Number: 2313070-2

Funding Sources: N/A

Abstract #62

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Exosome-Mediated Systemic Signaling: Mechanisms, Disease Integration, and Translational Potential

Intro: Exosomes have emerged as active mediators of systemic intercellular communication, transferring proteins, lipids, mRNAs, miRNAs, DNA, and metabolites between distant organs. Rather than functioning as passive extracellular vesicles, exosomes regulate signaling pathways that maintain physiological homeostasis and contribute to disease progression. This review summarizes the molecular mechanisms underlying exosome biogenesis, cargo selection, and intercellular signaling, highlighting their roles in chronic disease and their translational potential.

Methods: A comprehensive literature search was performed using the PubMed database to identify peer-reviewed studies investigating exosome biogenesis, cargo selection, intercellular communication, disease-associated signaling, and translational applications.

Results: Current evidence demonstrates that exosomal cargo is actively remodeled by cellular stressors, including hypoxia, oxidative stress, inflammation, and metabolic dysfunction. Following uptake by recipient cells, exosomes modulate signaling pathways involved in inflammation, metabolism, fibrosis, angiogenesis, and immune regulation, thereby propagating pathological signaling across multiple tissues. Consequently, exosomes contribute to the development and progression of chronic diseases, including diabetes, chronic kidney disease, cardiovascular disease, neurodegenerative disorders, and cancer. Their presence in readily accessible biological fluids also supports their potential as minimally invasive biomarkers and therapeutic delivery vehicles. However, variability in isolation techniques, cargo characterization, and methodological standardization continues to limit clinical translation.

Conclusions: Exosomes function as dynamic systemic signaling platforms that coordinate inter-organ communication in health and disease. A better mechanistic understanding of exosome biology, together with standardized analytical approaches, will be essential for advancing their application as clinically relevant biomarkers and therapeutic targets.

IRB or IACUC Approval Number: None

Funding Sources: None

Abstract #63

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Predicting Chemotherapy-Related Hospitalization in Breast and Gynecologic Oncology Using Wearables

Background: Unplanned emergency department (ED) visits during chemotherapy contribute to increased morbidity, treatment delays, and healthcare costs. Consumer wearable devices enable continuous, passive monitoring of physiologic metrics and may facilitate early detection of clinical deterioration. Heart rate variability (HRV), a noninvasive measure of autonomic function, has been associated with treatment toxicity and adverse clinical outcomes.

Objective: To determine whether acute declines in wearable-derived HRV predict unplanned ED visits among patients with breast or gynecologic cancers receiving first-line chemotherapy. We hypothesize that a $\geq 10\%$ reduction in HRV from baseline increases the risk of an ED visit within the subsequent seven days.

Methods: This prospective, observational, longitudinal cohort study will enroll approximately 100 adult women with breast or gynecologic malignancies initiating at least three cycles of first-line chemotherapy at the WVU Mary Babb Randolph Cancer Center and UHC Oncology Clinics. Participants will wear a Fitbit Inspire 3 to continuously collect HRV, resting heart rate, physical activity, and sleep data. Data will be integrated through Fitabase into REDCap and secure institutional servers. Monitoring includes a 7-day baseline, five months of chemotherapy, and one month of follow-up. Longitudinal HRV trajectories will be analyzed, and predictive performance will be evaluated using sensitivity, specificity, and area under the receiver operating characteristic curve.

Results: Results from this study are still pending.

Conclusions: Findings from this study may establish wearable-derived HRV as an accessible digital biomarker for identifying patients at increased risk of acute clinical deterioration during chemotherapy.

IRB or IACUC Approval Number: STUDY00000136

Funding Sources: WVU Department of Medicine Accts (Cost Center), Funding Source ID: department of ob gyn

Abstract #64

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Rethinking Piriformis Syndrome: The Role of Sacroiliac Joint Dysfunction in Posterior Hip Pain-A Narrative Review

Background: Posterior hip and buttock pain has a broad differential that includes piriformis syndrome and sacroiliac (SI) joint dysfunction, two entities with substantial clinical overlap. Piriformis syndrome remains one of the least well-defined and potentially overdiagnosed conditions in musculoskeletal medicine, lacking universally accepted diagnostic criteria. Because both conditions can produce buttock-dominant pain that worsens with sitting and radiates into the posterior leg, distinguishing the true pain generator is often difficult in clinical practice.

Purpose: This narrative review examines the available literature linking SI joint dysfunction to piriformis-type symptoms and proposes a framework in which piriformis hypertonicity may represent a secondary muscular response to underlying sacral positional faults rather than the primary pain generator.

Methods: A focused narrative review of the anatomical, biomechanical, and clinical literature was performed. Relevant studies were synthesized narratively, with particular emphasis on piriformis anatomy and function, its biomechanical relationship to sacral position, and evidence linking SI joint dysfunction to alterations in hip mechanics and gait.

Conclusion: Given the muscle's direct sacral origin, alterations in sacral mechanics may plausibly alter piriformis resting tension and produce symptoms that mimic piriformis syndrome. This model suggests that treatments directed solely at the piriformis may yield only temporary relief when SI joint dysfunction is the underlying driver. Clinicians evaluating posterior hip pain should maintain a high index of suspicion for occult SI joint pathology. Prospective studies are needed to test this hypothesis directly.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #65

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Predictors of Failure Following Lateral Locked Plating of Distal Femur Fractures: A Systematic Review and Meta-analysis of 7,913 fractures

Background: Lateral locked plating (LLP) is commonly used to treat distal femur fractures; however, complications including nonunion, infection, implant failure, and reoperation remain common. Numerous patient, fracture, and construct characteristics have been proposed as predictors of failure, but their associations have not been systematically quantified. This systematic review and meta-analysis evaluated predictors of failure following LLP of distal femur fractures.

Methods: A systematic review was performed according to PRISMA guidelines by searching PubMed, Embase, Scopus, Web of Science, and Cochrane CENTRAL. Studies evaluating predictors of failure after LLP of distal femur fractures were included. The primary outcome was reoperation to promote union. Secondary outcomes included nonunion, implant failure, and infection. Random-effects meta-analyses were performed using adjusted odds ratios when available and unadjusted odds ratios otherwise.

Results: Sixty-eight studies comprising 7,913 patients treated with LLP were included. The pooled incidence of reoperation was 16.9%, nonunion 13.7%, implant failure 6.7%, and infection 5.9%. Thirteen predictor meta-analyses were performed. Diabetes was associated with increased odds of reoperation (OR 2.02, 95% CI 1.11–3.68). Open fractures were associated with increased odds of nonunion (adjusted OR 2.99, 95% CI 2.06–4.33) and postoperative infection (OR 3.84, 95% CI 1.70–8.71). No significant associations were identified for smoking, obesity, sex, steroid use, fracture comminution, intra-articular fracture, periprosthetic fracture, or plate material.

Conclusions: Reoperation and nonunion remain common following LLP. Open fracture was the most consistent predictor of nonunion and infection, while diabetes increased the likelihood of reoperation. Evidence supporting many other proposed risk factors remains limited, highlighting the need for prospective studies.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #66

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Establishing a fiber photometry model to investigate medial habenula activity during relapse

Cocaine use disorder is a pattern of cocaine use that leads to clinically significant distress or impairment. The disorder is characterized by compulsive seeking and high rates of relapse. Previous work has shown that the medial habenula has some influence on reward-related behaviors, such as those that lead to relapse. Despite this link, the extent of influence remains incompletely understood. This study aimed to use fiber photometry methods to examine the activity of medial habenula cholinergic neurons during extinction and reinstatement of cocaine self-administration in mice.

Adult CHaT-Cre mice underwent jugular vein catheterization, followed by 12 days of IV self-administration (IVSA). Behavioral measures, including active lever presses, inactive lever presses, cocaine infusions earned, and locomotor activity, were recorded during IVSA. These mice then received stereotaxic infusions of Cre-dependent Adeno-Associated Virus encoding GCaMP7f into their medial habenula. Optical fibers were then implanted into the viral infusion site. Following this, fiber photometry data were recorded during extinction in group one and during extinction followed by cue-induced reinstatement in group two.

Behavioral measurement data showed successful completion of the IVSA protocol. Fiber photometry data have been successfully acquired and are currently undergoing further analysis.

These findings help to establish an experimental method for showing medial habenular cholinergic neuron activity during cocaine-seeking behavior. Ongoing analysis of the photometry data will look into the relationship between medial habenular cholinergic activity and cocaine-seeking behavior.

IRB or IACUC Approval Number: 2384994-2

Funding Sources: MURC Start-Up Funds

Abstract #67

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Increasing Student Interest in Rural Medicine through the Rural Appalachian Medical Preceptorship (RAMP)

Introduction: Prior research on Family Medicine residency programs indicates a higher percentage of residents pursuing rural medicine when exposed to rural medicine through their program's rural training track. Currently there is a lack of medical student interest in contemplating practicing in rural areas. The RAMP track at the Joan C. Edwards School of Medicine attempts to close this gap by exposing cohorts of rising second year medical students to rural primary care offices across rural West Virginia over the summer during pre-clerkship years.

Methods: Individual students were placed at rural medical facilities in southern West Virginia and paired with physician preceptors in primary care. Students worked with preceptors and local healthcare workers, as well as conducted interviews with rural community leaders. The three-week immersion experience was capped with a Family Medicine grand rounds presentation to evaluate student learning. Pre- and post-experience journaling was analyzed for themes of rural healthcare, medical leadership, and importance of social determinants of health by qualitative research methodology

Results: While full analysis is still pending, participating students unanimously reported an increased understanding of and interest in rural medicine. Students also expressed increased knowledge of the social determinants of health affecting rural communities and how they are addressed.

Conclusion: The RAMP program has demonstrated significant effectiveness in introducing rural medicine to pre-clerkship medical students. Continued implementation of this program is likely to increase early student involvement in rural medicine, preparing students for later clerkship opportunities in rural medicine and increasing engagement in rural medicine tracks and residencies.

IRB or IACUC Approval Number: 2322806-2

Funding Sources: N/A

Abstract #68

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Study to regulate the chemokine binding protein to restrain inflammation

Background: Chronic inflammation underlies the progression of multiple cardiometabolic and inflammatory diseases. Chemokines are central regulators of immune cell trafficking and inflammatory amplification. Persistent activation of the C-C motif chemokine ligand 5- C-C motif chemokine receptor 5 (CCL5-CCR5) signaling axis promotes macrophage recruitment and sustained cytokine release, contributing to tissue damage. Targeting chemokine signaling using novel biomolecular platforms represents a promising strategy to restrain pathological inflammation.

Aim: To engineer and validate a DNA nanostructure-based platform capable of conjugating the chemokine ligand CCL5 to modulate CCR5-mediated inflammatory signaling.

Methods: A six-helix DNA nanostructure was designed using DNA origami methodology. Assembly efficiency and structural integrity were validated by gel electrophoresis, followed by SYBR Gold staining. Covalent conjugation of CCL5 to the DNA nanostructure was achieved using carbodiimide-mediated chemistry, employing EDC and Sulfo-NHS to activate carboxyl groups and promote stable amide bond formation with primary amines on the CCL5 protein. Conjugation products were analyzed by electrophoretic mobility.

Results: The six-helix DNA nanostructure was successfully constructed and exhibited consistent electrophoretic mobility, confirming structural stability. Following carbodiimide-mediated conjugation, our results showed that the six-helix DNA-CCL5 nanostructure demonstrated a distinct electrophoretic shift, corresponding to the formation of a higher molecular weight compared to the DNA nanostructure.

Conclusion: This study establishes a robust DNA nanostructure platform for chemokine conjugation and provides a foundation for future investigations into CCR5 receptor engagement and regulation of inflammatory signaling. The novel DNA nanostructure construct, which specifically targets CC-chemokine-CCR5 interactions, may offer effective anti-inflammatory treatment strategies in clinical settings.

IRB or IACUC Approval Number: N/A

Funding Sources: Department of Biomedical Engineering

Abstract #69

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Patterns of Recreational Sports Injuries After Total Hip and Total Knee Arthroplasty: A National Analysis

Background: Total joint arthroplasty (TJA) utilization continues to rise, and contemporary evidence supports return to recreational activity, including racquet sports, after hip and knee replacement. However, no national study has characterized the injuries sustained during recreational activity in patients with prior arthroplasty. This study used a national emergency department surveillance database to describe the activities, mechanisms, injury patterns, and prosthesis-related risk associated with recreational sports injuries after total hip (THA) and total knee arthroplasty (TKA).

Methods: Cases of recreational activity-related injury in patients with prior THA or TKA were identified via narrative-keyword screening of the National Electronic Injury Surveillance System (NEISS), 2015–2025. Patient demographics, activity at time of injury, injury mechanism, diagnosis, prosthesis-threat level, and disposition were compared between THA and TKA using chi-square/Fisher's exact and Wilcoxon tests. Multivariable logistic regression (Firth's penalized likelihood) identified factors associated with a major prosthesis-threatening injury.

Results: 162 cases were identified (94 THA, 68 TKA; mean age 69 ± 13 years). Activity at injury differed by joint, with TKA patients more often injured while walking/hiking (66% vs. 38%) and THA patients more often during gym/exercise activity (34% vs. 18%, $p=0.001$). Injury mechanism also differed (falls: 54% TKA vs. 32% THA; overuse/strain: 37% TKA vs. 50% THA, $p=0.048$). THA injuries were predominantly prosthetic dislocation (61% vs. 2.9% TKA, $p<0.001$) and were substantially more likely to be classified as major prosthesis-threatening (71% vs. 19%, $p<0.001$). On multivariable analysis, TKA was independently associated with markedly lower odds of a major prosthesis-threatening injury compared to THA (OR 0.11, 95% CI 0.05–0.22, $p<0.001$), and increasing age was independently associated with modestly higher odds (OR 1.03 per year, 95% CI 1.00–1.06, $p=0.029$).

Conclusion: Recreational sports injuries in arthroplasty patients differ meaningfully by joint: THA patients sustain a disproportionate burden of prosthesis-threatening dislocation, particularly during overuse/pivoting activities, while TKA injuries more often result from falls and are less frequently implant-threatening. These findings support joint-specific return-to-activity counseling for arthroplasty patients engaging in recreational sports.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #70

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Predictors of IUD Expulsion Among Adolescents

Intrauterine Devices (IUDs) are effective, safe, and regarded as a first-line treatment in adolescents for contraceptive management and menstrual suppression. Although IUD use may improve bleeding patterns, the overall risk of expulsion amongst adolescents lies between 5-22%.

Known risk factors for IUD expulsion include adolescence, nulliparity, obesity, and HMB. Identifying patterns with modifiable risk factors can improve counseling and clinical management for patients considering IUD use. IUDs exert their effect by thinning the endometrial lining. It is known that patients with HMB and/or who maintain an anovulatory status have thickened linings. This study aims to determine whether menstrual patterns, timing from last menstrual period, BMI, and history of hormonal therapy use are associated with increased IUD expulsion risk in adolescent patients.

This retrospective chart review included adolescent Marshall Health patients undergoing IUD insertion under sedation between January 2020 and December 2024. We excluded patients with a previous pregnancy, nonhormonal IUD use, and those younger than 10 or older than 24.

104 adolescent IUD placements were analyzed thus far. Nine of these patients experienced expulsion, with one experiencing it twice. Of the nine patients, half had a prior hormonal method, and all attended a follow-up string check appointment. This limited data demonstrates an 8.7% expulsion rate, which falls within the current cited range, 5-22%, for pediatric IUD expulsion rates.

Ongoing data collection will continue to evaluate the effects of menstrual patterns, timing from last menstrual period, BMI, and past use of hormonal therapy on adolescent IUD expulsion.

IRB or IACUC Approval Number: 2376167-1

Funding Sources: N/A

Abstract #71

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Agent Omics: An Agentic Tool for Multi-Omics Analysis Across Diverse Organisms

Biomedical and agribiotech research generates unprecedented volumes of multi-omics data, creating demand for flexible analytical workflows. Conventional platforms provide powerful capabilities but constrain researchers to predefined interfaces. Artificial intelligence (AI) agents powered by large language models (LLMs) are emerging in computational biology that are better positioned to extract information from complex datasets.

In this new paradigm we present an agentic bioinformatics framework called “AgentOmics” enabling researchers to tackle complex biological challenges through natural language. The system is demonstrated using one of our ongoing DOE funded project- B5 (Bigger Better Brassicaceae Biofuels and Bioproducts) multi-omics data integrating transcriptomic, proteomic, and metabolomic measurements.

The framework combines a locally deployed GPT-OSS-120B large language model (LLM) with a Model Context Protocol (MCP). The LLM serves as an intelligent orchestration layer that interprets research questions, integrates with available databases, tools, and modules, and synthesizes results into biologically meaningful interpretations with supporting visualizations. This architecture enables researchers to execute complex analyses through natural-language interactions without requiring detailed knowledge of individual software packages or workflow implementations.

The framework reduces configuration effort for routine analyses while keeping researchers in control of the scientific process. By coupling natural-language understanding with dynamic tool orchestration, it transforms the research problem in any domain from software-driven to question-driven exploration, enabling accessible and collaborative multi-omics analysis with full scientific rigor. In AgentOmics, deployment across Camelina, Pennycress, and Cuphea with integrated transcriptomic, proteomic, and metabolomic data has streamlined identification of relationships both within and across organisms, yielding deeper biological insights through direct comparison of multi-omics datasets.

IRB or IACUC Approval Number: None

Funding Sources: DOE, NSF, NIH

Abstract #72

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KBCommons: An Integrated Multi-Omics Informatics Framework for Precision Medicine and Cross-Species Discovery

Biomedical discovery is increasingly limited not only by the availability of data, but by its fragmentation — genomic, proteomic, and clinical datasets are often scattered across disconnected repositories, slowing integrated analysis and limiting accessibility for many researchers. The Knowledge Base Commons platform (kbcommons.org) addresses this gap as an open-access, community-driven informatics framework built to integrate structured multi-omics data across species within a single infrastructure, supporting research spanning human biomedicine, agricultural biotechnology, and microbial and viral systems alike.

Within KBCommons, the 3D Omics Studio serves as an interactive differential-expression tool offering a system-level view of multi-omics datasets for any organism on the platform. It unifies Upset-plot analysis, 2D volcano plots, Gene Ontology functional analysis, KEGG and Reactome pathway analyses, a Reactome foam visualization, and protein–protein interaction networks in one interface, placing differentially expressed genes into functional and regulatory context so patterns invisible in a single dataset become clear at a glance.

Extending this analysis across organisms, the Cross-species and Comparative Multi-omics Translation (CCMT) tool enables comparative genomics — identifying homologous genes across transcriptomic, proteomic, and other omics layers, and reconstructing gene regulatory networks with GENIE3 for intra- and inter-species analysis across experimental conditions.

Together, the 3D Omics Studio and CCMT form a unified ecosystem within KBCommons that transforms fragmented multi-omics data — across humans, crops, and microbial or viral organisms — into an accessible, hypothesis-generating resource for biomedical and agribiotech research.

IRB or IACUC Approval Number: N/A

Funding Sources: National Science Foundation, U.S. Department of Energy, United Soybean Board, National Institutes of Health, Marshall University

Abstract #73

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Adipose Cefazolin Concentrations at Fascial Closure Following 3 g Prophylaxis in Class III Obesity: A Prospective Cohort Design

Background: Three grams of cefazolin is recommended for cesarean prophylaxis in obesity, but tissue-level evidence is conflicting. One cohort found 3 g reached target adipose concentrations in all women with BMI 30–40 but only 71% above 40; a randomized trial the same year found no difference between 2g and 3g and did not support 3-g dosing. Cross-study comparison is limited by differing MIC thresholds. Every class III estimate derives from a subgroup of ≤ 14 patients, no study has been powered in the population where dosing certainty is lowest and surgical site infection risk highest.

Objective: To estimate the proportion of women with BMI ≥ 40 kg/m² receiving 3 g cefazolin whose adipose concentration at fascial closure meets the CLSI susceptible breakpoint, and to identify determinants of subtherapeutic exposure.

Methods: Prospective single-arm cohort at single academic institution. Enrolling 42 women with BMI ≥ 40 , age ≥ 18 , undergoing non-emergent cesarean delivery receiving 3 g cefazolin. Exclusions: beta-lactam allergy, chorioamnionitis, therapeutic antibiotics within 48 h, eGFR < 60 , dose-to-incision interval outside 15–60 minutes. Adipose biopsies at fascial closure and skin incision, with paired plasma, analyzed by validated LC-MS/MS. Primary endpoint: proportion with closure concentration $\geq 8\mu\text{g/g}$.

Reported with exact 95% CI; 36 evaluable patients give $\pm 15\%$ precision assuming 0.71. Secondary: incision concentrations, adipose:plasma ratio, association with incision-to-closure interval and weight

Significance: A precise estimate at this BMI range would determine whether 3 g suffices, or define the population for whom redosing by surgical duration or 4 g warrants trial evaluation.

IRB or IACUC Approval Number: IRB will be submitted prior to beginning study, no required to present a design

Funding Sources: N/A

Abstract #74

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Expression of GABA receptor subunit genes in medial habenula cholinergic neurons during cocaine conditioned place preference.

Substance use disorder remains a major health problem in society, with relapse being a major barrier to successfully recovering from drug use. The medial habenula (MHb) has emerged as a significant regulator of drug-seeking behavior and relapse; however, the transcriptional mechanisms during cocaine-associated learning in the medial habenula are not fully understood. Recent evidence suggests that changes in GABAergic signaling play a role in regulating the activity of MHb cholinergic (ChAT-positive) neurons during late withdrawal and reinstatement. Cocaine conditioned place preference (CPP) will be used to model cocaine-associated reward and reinstatement. Expression of the GABA-related genes *Gabra1* and *Gabra2* will be quantified using RNAscope in ChAT-positive MHb neurons following CPP acquisition and reinstatement. We hypothesize that *Gabra1* and *Gabra2* expression will increase after reinstatement. Characterizing the cell-type specific genetic changes in MHb neurons may provide insight into the molecular mechanisms underlying cocaine relapse.

IRB or IACUC Approval Number: 2384994-2

Funding Sources: MURC Startup Funds

Abstract #75

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Synthetic cooling agents enhance nicotine reinforcement and mesolimbic dopamine signaling

Flavor additives in electronic delivery systems (ENDS) have been shown to enhance nicotine reinforcement. Although some states and cities have pursued implementation of menthol bans, synthetic coolants such as WS-3 and WS-23 have emerged as substitutes. In this study, we investigated the impact of WS-3 and WS-23 on nicotine self-administration behavior and dopamine (DA) release in the nucleus accumbens (NAc) core. To model nicotine reinforcement, we used an E-Vape® self-administration (EVSA) assay and observed that male and female mice exposed to nicotine plus WS-3 and WS-23 exhibited enhanced self-administration behavior when compared to mice exposed to nicotine alone or PGVG (control treatment). We also observed that the enhancement in nicotine self-administration is similar to what is observed with menthol. To measure changes in dopamine release, we used fast-scan cyclic voltammetry (FSCV) and fiber photometry. Here, we observed that WS-3 and WS-23 increased the amount of dopamine released in the NAc under both tonic (5 Hz) and phasic (60 Hz) stimulation conditions when compared with nicotine-alone. Fiber photometry recordings showed that the WS-3 and WS-23 enhanced nicotine-stimulated dopamine release in the NAc core. In both FSCV and photometry assays, synthetic coolants produced enhancements in dopamine signaling that were comparable in magnitude to those observed with menthol. These findings demonstrate that synthetic cooling agents enhance nicotine reinforcement and are associated with increased mesolimbic dopamine signaling and increased nicotine-induced nAChR upregulation.

IRB or IACUC Approval Number: 664

Funding Sources: R011-DA060846 R01-DA050717

Abstract #76

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Decline of gross anatomy in medical education V: Online approaches to compensate for the decline in instruction in Gross Anatomy

Training in Gross Anatomy has decreased dramatically in recent years in the education of physicians and other medical professionals (Weston, Can Med Educ J. 27:109, 2018). Curricular changes which reduce or eliminate elements of instruction in the Anatomical sciences could particularly affect the knowledge of body structure needed to interpret images (CT and MRI), which are now used by physicians specializing in surgery and obstetrics/gynecology, as well as by emergency medicine personnel. To attempt to counter this development, we have developed new approaches to training in Gross Anatomy at the Joan C. Edwards School of Medicine of Marshall University by expanding and diversifying online instruction. We have developed a website that serves a library of videos and outline notes for traditional lectures that encompass rigorous presentations of basic science and imaging with immediate integration of the clinical conditions and consequences of Gross Anatomy. Student feedback about this website has remained quite positive. We are also planning on establishing a center for study of the potential consequence of reduction of training in the basic sciences to the recent large increase in medical errors (reported as the third leading cause of mortality in the US, Rodziewicz et al., StatPearls 2024), which has not been adequately examined in the medical literature and invite participation from other institutions.

IRB or IACUC Approval Number: IACUC approved study 1563155

Funding Sources: NSF CRCNS 2113028

Abstract #77

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Improving Access to Pacemaker Interrogation Reports Through Electronic Integration Into the Cerner Electronic Medical Record: A Quality Improvement Project

Background: Pacemaker interrogation reports are essential for timely clinical decision-making. In our current workflow, reports are maintained in paper charts rather than being directly available within the electronic medical record (EMR), resulting in difficulty locating reports, risk of misplaced documentation, and potential delays in patient management and discharge.

Objective: To improve the accessibility, efficiency, completeness, and reliability of pacemaker interrogation documentation by implementing a standardized process for electronically uploading reports into the Cerner EMR.

Methods: A quality improvement initiative using the Plan-Do-Study-Act (PDSA) framework was developed in collaboration with cardiology, electrophysiology, device clinic, and information technology staff. The intervention will transition from paper-based storage to electronic uploading of interrogation reports into a dedicated Cerner results tab accessible to authorized healthcare providers. Cardiology fellows will use a standardized process to document key device parameters, including battery longevity, sensing amplitudes, pacing percentages in the atrium, right ventricle, and left ventricle when applicable, device type, manufacturer, significant arrhythmias and their type, and whether antitachycardia therapy or shocks were delivered. Pre- and post-intervention assessments will evaluate report accessibility, time required to locate reports, completeness of documentation, delays in clinical decision-making or discharge, missing reports, and staff satisfaction.

Results: Primary outcomes will include the proportion of reports electronically available, time to access reports, completeness of standardized device documentation, and frequency of delays attributable to unavailable reports. Secondary outcomes will include missing documentation, discharge delays, and staff satisfaction.

Conclusion: Electronic integration with standardized device documentation may improve accessibility and completeness of pacemaker interrogation information, facilitate clinical decision-making, reduce documentation-related delays, and improve patient care.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #78

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Cardiomyocyte Na/K-ATPase α -Isoform-Specific role during Angiotensin-II induced Cardiac Remodeling in the Mouse

Cardiac Na/K-ATPase α 1 (NKA α 1) expression declines during heart failure. NKA α 1 is both an ion pump and a Src-dependent signaling receptor, but the role of NKA α 1-specific signaling in cardiac remodeling remains unclear. Using a Myh6-Cre/Lox approach in mice, we generated cardiomyocyte-specific ATP1A1 deletion (cardiac α 1^{-/-}) and rescue lines expressing transgenic cardiac NKA α 1 or NKA α 2. Because NKA α 2 supports ion transport without binding Src, these models separate signaling-dependent from enzymatic effects. Cardiac α 1^{-/-} mice exhibited 60% lower cardiac NKA activity (n=5, p<0.0001), with NKA α 1 loss confirmed by western blotting (n=8, p<0.0001). Baseline protein carbonylation was reduced, consistent with diminished NKA α 1/Src/ROS signaling. Angiotensin II infusion (1.5 mg/kg/day; n=6–15) increased the Heart Weight/Tibia Length (HW/TL) ratios of 10–12-week-old males by 20% in cardiac α 1^{+/+} (P<0.01) but not cardiac α 1^{-/-} mice, suggesting a blunted hypertrophic response to an increased hemodynamic load. In contrast to cardiac α 1^{+/+}, mortality in cardiac α 1^{-/-} mice began on day 7, with increased cardiac fibrosis (6% versus 4%, n=6, p<0.05). Western blotting confirmed the expected cardiac transgenic rescue of either NKA α 1 or NKA α 2 in cardiac α 1^{-/-} mice. Both groups survived 14 days of angiotensin II treatment and developed hypertrophy (Heart Weight (HW)/Body Weight (BW) ratios: NKA α 1 rescue: 4.73 to 5.77 mg/g, n=4-5, p<0.01; NKA α 2: 4.813 to 5.837 mg/g; n=3–5, p<0.01). In contrast, angiotensin II-induced increases in COL1A1 mRNA and type I collagen protein were significantly greater in NKA α 1-rescued compared to NKA α 2 rescued hearts (n=3–4, p<0.05), revealing a new NKA-isoform specific effect in cardiac fibrotic remodeling.

IRB or IACUC Approval Number: 630

Funding Sources: Supported by American Physiological Society Summer Undergraduate Research Fellowship (PI: Chandrasekar), American Heart Association 26PRE1544880 (PI: Strause), 25TPA1477521 (PI: Pierre), 22POST917776 (PI: Pessoa), and NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence.)

Abstract #79

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Characterizing Diabetic Skin Infections in an Appalachian Population: A Retrospective Cohort Study

Introduction: The Appalachian region experiences disproportionately high rates of chronic disease, including

obesity, diabetes, and peripheral vascular disease, which increase the risk for diabetic skin infections. Geographic and socioeconomic barriers to healthcare access contribute to delayed diagnosis and treatment, increasing the risk of complications and amputations. This retrospective study analyzes patient demographics, clinical characteristics, and treatments for patients with diabetic skin infections.

Results: A total of 106 patients with diabetic lower extremity ulcers were included, comprising 72 females and 34 males. The most common ulcer locations were the great toe, other toes, and plantar foot. MRSA was the most frequently isolated pathogen, followed by Group B Streptococcus, while polymicrobial infections were more common among males. Females demonstrated a larger median ulcer area and were more frequently treated with doxycycline, vancomycin, and surgical debridement.

Discussion: Diabetic foot ulcers in this rural Appalachian cohort predominantly affected distal regions of the foot and were commonly associated with MRSA infection. Despite similar glycemic control between sexes, notable differences in ulcer size, microbiology, and treatment patterns were observed. These findings highlight the burden of diabetic foot disease in rural populations and underscore the importance of early detection, appropriate antimicrobial selection, and timely wound management to reduce complications. Larger prospective studies are warranted to further optimize treatment strategies in underserved Appalachian communities.

Conclusion: This study highlights the variability in diabetic foot ulcer characteristics, microbiology, and treatment. These findings may improve risk assessment and management of diabetic foot ulcers to reduce complications and improve outcomes

IRB or IACUC Approval Number: 2364461

Funding Sources: This work was supported by and the WV Clinical and Translational Science Institute Bench-to-Bedside grant to WX (U54GM104942).

Abstract #80

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Complex Regional Pain Syndrome After Total Joint Arthroplasty: Diagnostic Challenges and the Role of Sympathetic Nerve Blocks

Complex regional pain syndrome (CRPS) is a chronic pain condition characterized by disproportionate, persistent pain accompanied by multisystem changes including sensory, vasomotor, sudomotor, and motor/trophic features, typically following tissue injury (1,2). Pain develops days to weeks after the inciting event and is often described as a burning sensation that is disproportionate to the injury and extends beyond the affected region (1).

In the setting of total hip arthroplasty (THA) or total knee arthroplasty (TKA), CRPS represents a potential but underrecognized etiology of persistent postoperative pain when more common causes have been excluded, including periprosthetic joint infection, aseptic loosening, and mechanical complications such as instability or malalignment.

Diagnosis in this population remains challenging because of overlapping clinical features and the absence of definitive diagnostic testing. A high index of suspicion is therefore required, particularly in patients presenting with persistent pain exceeding the expected postoperative course accompanied by features of autonomic dysregulation.

The purpose of this narrative review is to summarize the diagnosis of CRPS following THA or TKA, outline management strategies, and describe the potential role of sympathetic nerve blocks in this population.

IRB or IACUC Approval Number: IRB and IACUC approvals were not required because this project is a literature review utilizing public, previously published data.

Funding Sources: None

Abstract #81

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Reducing Time to Provider Response for Outpatient Lab Results in a Family Medicine Continuity Clinic

Aim: Identify whether the use of a Mobile app push notification informing the provider of a Lab result has an effect on response time of Lab orders placed by the residents in their continuity clinic routed to the EMR inbox, which is only accessed through a verified computer device.

Background: Delayed follow-up of test results is a recognized ambulatory patient-safety hazard; up to 62% of abnormal laboratory results may lack timely follow-up, and 15–54% of primary care errors are attributed to laboratory-testing processes. [3]

Design and setting: A retrospective observational quality-improvement analysis was conducted in the Holzer family medicine outpatient continuity clinic during the period (May 1–August 11, 2026), using Athena result-routing and audit-log data.

Population: All Family Medicine residents continuity providers (PGY-1 through PGY-3) and the outpatient laboratory results ordered by them during the study window were included.

Measures: Two outcome measures were abstracted for each result: (1) time to review, interval from result availability to provider acknowledgment, and (2) time to close, interval from result availability to documented closure of the result. Expressed as average.

Grouping: Residents were stratified into two groups by result-notification workflow, those who used Athena One Mobile App Push notifications versus those who did not, and the two outcomes were compared between groups.

Analysis: Per-resident average time to review and time to close were summarized as mean and compared between notification groups using an unpaired t-test. Data were also stratified by PGY level.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #82

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Assessing TikTok as a Source of Total Knee Arthroplasty Patient Education

Background: As the internet and social media platforms have grown in popularity and accessibility, patients increasingly use these platforms for health information. Additionally, medical professionals (MPs) have begun using platforms like TikTok to disseminate educational material. This study aims to evaluate the quality of total knee arthroplasty (TKA) educational content on TikTok.

Methods: On July 31, 2025, using the search terms “total knee arthroplasty,” “knee replacement surgery,” and “TKA,” the first 150 videos returned by TikTok were compiled. After applying exclusion criteria, 59 videos were reviewed using the following assessments: Global Quality Score (GQS), Journal of the American Medical Association (JAMA) benchmark, Health on the Net Code (HONcode), Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT- A/V), and a modified DISCERN.

Results: The 59 videos had a cumulative total of 2,738,858 views. Videos created by MPs had higher average scores in GQS (2.29 vs 1.31; $P = .00047$), JAMA benchmark (1.76 vs 1.31; $P = .00056$), HONcode (3.95 vs 2.40; $P < .000001$), PEMAT-A/V understandability (8.29 vs 7.20; $P = .0033$), and modified DISCERN (2.3 vs 1.1; $P < .0008$) when compared to videos created by non-MPs.

Conclusions: TikTok demonstrates potential to disseminate educational content related to TKA. While MP-generated content consistently scored higher across assessments than non-MP content, the overall quality of content remained limited. Content creators could improve video quality by citing credible sources, providing supplementary learning materials, and disclosing potential conflicts of interest.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #83

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Anticancer activity of DL-erythro/threo Sphinganine secreted by model moss *Ceratodon purpureus*

Triple Negative Breast Cancer (TNBC) is a type of breast cancer that lacks estrogen receptors, progesterone receptors, and human epidermal growth factor receptors. This type of breast cancer is one of the most aggressive, and there are few treatment targets. TNBC accounts for 15% breast cancers worldwide.

Plants have been known to have medicinal value for centuries. Recently, the Shakirov Lab has discovered antimicrobial and anti-proliferative properties of secondary metabolites produced by model moss *Ceratodon purpureus*. Within the secreted moss exudates, compound DL-erythro/threo Sphinganine has shown significance in decreasing cellular activity of MDA-231 triple negative breast cancer cells after 2-day treatment.

Poly ADP-ribose polymerases (PARPs) are enzymes that catalyze the transfer of ADP-ribose polymers onto proteins in the process of DNA repair and cell cycle regulation. PARP inhibitors block the poly ADP-ribose polymerase, which prevents DNA repair. This process causes single and double stranded DNA breaks, resulting in genomic instability and cell death. Talazoparib is a first-generation FDA approved PARP 1 and 2 inhibitor. Saruparib is not yet FDA approved, but it is selective for inhibiting PARP 1. These PARP inhibitors have shown effective anti-tumor activity in cancers with BRCA mutations, including TNBC.

The goal of this research is to analyze the effects of Talazoparib, Saruparib, and DL-erythro/threo Sphinganine on MDA-231 TNBC cells when treated at varying concentrations, alone and in combination. We will present our recent data from the checkerboard assays evaluating the effects of the combined use of DL-erythro/threo Sphinganine and PARP inhibitors on cancer cell viability.

IRB or IACUC Approval Number: N/A

Funding Sources: A subaward from the Appalachian Natural Product Research Program (ANPRP) USDA Grant No. 58-6060-2-006 to L.M.B and E.V.S.

Abstract #84

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Joint-Line Restoration Within 4 mm and Posterior Condylar Offset Change Are Independently Associated With Revision-Free Survival Following Aseptic Revision Total Knee Arthroplasty

Background: Restoration of the native joint line and posterior condylar offset (PCO) is considered an important technical objective during aseptic revision total knee arthroplasty (rTKA), yet its relationship to implant survivorship remains poorly defined. We evaluated whether postoperative joint-line difference (JLD) and PCO difference (PCOD) relative to the preoperative knee were independently associated with re-revision.

Methods: We retrospectively reviewed 250 consecutive aseptic rTKAs performed at a single tertiary referral center between 2014 and 2026. JLD and PCOD were measured on standardized radiographs. The primary outcome was re-revision; death without revision was treated as a competing event. Cause-specific Firth-penalized Cox regression identified independent predictors. Prespecified sensitivity analyses evaluated robotic assistance and implant-related variables, including fixation, constraint, polyethylene thickness, cones, augments, and offset adapters.

Results: Over a median follow-up of 2.2 years, 23 patients (9.2%) underwent re-revision and 8 (3.2%) died. Continuous JLD was not independently associated with re-revision; however, absolute JLD ≥ 4 mm conferred a greater hazard than restoration within 4 mm (HR 3.94, 95% CI 1.67–10.09; $P=0.002$). Greater postoperative PCO increases were independently associated with re-revision (HR 1.18 per millimeter, 95% CI 1.03–1.32; $P=0.015$), whereas PCO decreases were not. Robotic assistance was not independently associated with survivorship ($P=0.554$), and adjustment for implant characteristics minimally changed these associations.

Conclusions: Failure to restore the joint line within 4 mm and progressively greater PCO increases were independently associated with inferior revision-free survival after aseptic rTKA.

IRB or IACUC Approval Number: 2205529-2

Funding Sources: N/A

Abstract #85

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Preoperative Sexual Dysfunction in Total Hip Arthroplasty: Prevalence, Sex- and Age-Based Differences

Background: Sexual function is under addressed in patients with hip osteoarthritis despite its importance to quality of life. This study characterized recalled preoperative sexual dysfunction among patients undergoing total hip arthroplasty (THA), evaluated differences by sex and age, and identified predictors of moderate-to-severe sexual burden.

Methods: An anonymous online survey was distributed to patients from two academic medical centers who underwent elective primary THA between January 2019 and December 2024. Survey items assessed sexual activity, satisfaction, desire, arousal, orgasmic function, relationship impact, and hip pain-related limitations. Multivariable logistic regression identified independent predictors of moderate-to-severe sexual burden and dysfunction domains.

Results: A total of 423 respondents were included. Overall, 26% reported that hip pain limited daily activities, 22% reported limited sexual activity, 19% reported impaired orgasm, 22% reported negative effects on sexual relationships, and 24% reported an unsatisfying sex life due to hip pain. Younger patients reported greater hip pain-related sexual burden, whereas older patients reported more sexual dysfunction symptoms. Female respondents reported higher rates of functional and sexual burden domains. Hip pain limiting daily activities was the strongest independent predictor of moderate-to-severe sexual burden (OR 5.55, 95% CI 2.90–11.6, $p < 0.001$) and was associated with unsatisfying sex life (OR 13.00), sexual activity limitation (OR 37.60), and orgasm impairment (OR 9.04).

IRB or IACUC Approval Number: 2178966-1

Funding Sources: N/A

Abstract #86

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Beyond Fertility: Polyendocrine Metabolic Syndrome as a Lifelong Cardiometabolic Disorder With Emerging Microvascular Manifestations

Polyendocrine metabolic ovary syndrome, (PMOS), previously known as polycystic ovary syndrome (PCOS), has historically been treated as though it is disease exclusive to reproduction and fertility. However, these metabolic and hormonal abnormalities are present early in life and contribute to multisystem morbidity throughout adulthood. This narrative review will discuss PMOS as a chronic systemic disease, with evidence of cardiometabolic, vascular, hepatic, and ophthalmic disease involvement. Insulin resistance, hyperandrogenism, chronic inflammation, oxidative stress, and adipose dysfunction may drive connections between PMOS and obesity, dyslipidemia, abnormal glucose metabolism, metabolic syndrome, and type 2 diabetes mellitus. They may also play a role in endothelial dysfunction, arterial stiffness, hypertension, subclinical atherosclerosis, and increased cardiovascular disease and cerebrovascular events risk later in life. The liver may also be involved with PMOS; most notably, metabolic associated steatotic liver disease (MASLD). MASLD has been well established in patients with PMOS and can progress to steatohepatitis and fibrosis in patients with risk factors or genetic predisposition. There is also growing evidence in the field of ophthalmology to suggest PMOS has ocular effects that can lead to functional and morphologic changes to retinal and choroidal microvasculature, ocular surface, and other ocular structures; however, current studies are limited and conclusions about significance are mixed. Clinically, patients are screened and managed primarily for menstrual irregularities, hyperandrogenic symptoms, and fertility concerns. Metabolic, cardiovascular, hepatic, and ophthalmic risks are left unaddressed or are not assessed until symptoms become apparent many years later. Literature suggests that, instead, providers should approach patients with PMOS with individualized risk assessment, lifestyle modification when able, reduction of risk factors, and tailored pharmacotherapy when indicated, along with coordinated follow up care. PMOS should be thought of as a chronic systemic disease that affects patients from a young age throughout their life.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #87

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Reducing AI Hallucinations in Vaccine Development Using Curated Biomedical Data and a Model Context Protocol Server

Vaccine development is a complex and data-intensive process in which selecting optimal genes, proteins, epitopes, and other biological components can result in an enormous number of candidate combinations. Artificial intelligence (AI) and large language models (LLMs) have the potential to analyze vast amounts of biomedical data, extract relevant context, and generate hypotheses to accelerate vaccine discovery. However, LLMs are prone to hallucinations when reliable knowledge is limited or incomplete. To address this challenge, our group collects, curates, and integrates high-quality biomedical data from public resources and develops a Model Context Protocol (MCP) server to provide AI platforms with trusted contextual information for vaccine development. Data were collected from multiple public resources, including BV-BRC, VIOLIN, ProtaBank, AntiviralDB, PDB, and PubMed, using application programming interfaces (APIs), web crawling, and manual downloads. The datasets were curated using the Spherical data curation portal developed by our group and then uploaded into Globus Search indexes supported by Elasticsearch. Using the curated datasets, we developed an MCP server with the FastMCP framework. The server enables AI platforms to process natural language queries, invoke MCP tools when appropriate, retrieve relevant information from Globus Search indexes, and synthesize evidence-based responses. This approach provides AI systems with structured, curated context that helps reduce hallucinations and supports more reliable vaccine candidate discovery. Preliminary results demonstrate improved AI performance in selected use cases, although hallucinations remain. Future work will focus on expanding curated datasets and improving data processing, retrieval, and prompting strategies to further enhance the accuracy and reliability of AI-assisted vaccine development.

IRB or IACUC Approval Number: N/A

Funding Sources: Funded by ARPA-H

Abstract #88

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Multi-Biofluid Proteomic Biomarker Discovery in a Large Animal Model of CLN2 Disease

CLN2 disease is a fatal, inherited lysosomal storage disorder caused by deficiency of tripeptidyl peptidase 1 (TPP1), driving progressive neurodegeneration and systemic complications such as cardiac dysfunction. CNS-directed enzyme replacement therapy has improved disease management, but objective molecular biomarkers to track progression and treatment response are still lacking. Using a canine model of CLN2 disease, we performed untargeted proteomic profiling of three biofluids, cerebrospinal fluid (CSF), tears, and plasma, collected longitudinally from healthy controls and affected dogs at presymptomatic, mid-symptomatic, and advanced disease stages. For each biofluid, differential expression analysis identified proteins altered between affected and control animals across timepoints, followed by functional enrichment analysis of the affected pathways and multivariate integrative analysis (mixOmics) to identify correlated protein signatures across biofluids.

CSF showed the most extensive remodeling, with differentially abundant proteins increasing in number and magnitude as disease progressed. Altered pathways included cytoskeletal organization, synaptic signaling, lysosomal biology, mitochondrial metabolism, lipid homeostasis, and inflammation, with sustained elevations in Adducin 2, Dynein light intermediate chain, Gliomedin, Protein kinase C and casein kinase substrate in neurons protein 1, non-specific serine/threonine protein kinase, and Syntaxin-binding protein 1. Tears mirrored several CSF signatures, particularly mitochondrial metabolism, lysosomal function, lipid-related pathways, and extracellular signaling, while plasma showed more modest but detectable shifts in inflammatory and lipid metabolic markers.

Together, these findings reveal coordinated, disease-stage-dependent proteomic changes across the central nervous system and peripheral biofluids, nominating candidate biomarkers for tracking CLN2 disease progression and therapeutic response.

IRB or IACUC Approval Number: MU ACUC Protocol #39403 (archived — protocol closed/no longer active)

Funding Sources: Spinal Cord Injuries/Disease Research Program (SCIDRP)

Poster Session 2

Abstract #89

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When opioid withdrawal mimics neurologic disease: profound weakness, dysarthria, and encephalopathy

Acute opioid withdrawal typically presents with gastrointestinal symptoms, myalgias, diaphoresis, insomnia, and cravings. We present an unusual case of opioid withdrawal characterized by profound weakness, dysarthria, and altered mental status.

A 51-year-old woman with opioid dependence on long-term methadone maintenance was transferred for altered mental status after presenting from a correctional facility. On presentation, she opened her eyes to verbal stimuli, withdrew to pain, and could wiggle her fingers and toes. She followed commands with profound weakness, hypokinesia, and bradykinesia. She was treated for suspected sepsis and seizure activity. MRI, EEG, urinalysis, and lumbar puncture were nondiagnostic. Urine drug screening was negative but did not include buprenorphine. Electrolyte abnormalities and possible refeeding syndrome were treated but did not explain her neurologic findings, which preceded tube feeding.

Her neurologic function gradually improved over an 18-day hospitalization. By day 9, she could make a fist and move her wrists and face; by day 12, she could mobilize her arms from the shoulder. When verbal ability improved, she reported taking 80 mg of methadone daily for over 20 years before incarceration, where methadone was discontinued. After five days of detoxification, she received Suboxone and developed confusion and severe withdrawal symptoms within 1–2 days. Precipitated opioid withdrawal was suspected. Subutex 8 mg daily was initiated, followed by marked improvement in mentation, motor function, and verbal ability.

This case highlights a severe neurologic presentation of opioid withdrawal that mimics infectious or neurologic disease. Recognition of atypical withdrawal presentations may facilitate earlier diagnosis and treatment.

IRB or IACUC Approval Number: Formal IRB approval was not required for this single-case report as it falls under routine clinical documentation and educational presentation. Written informed consent for publication of clinical details and images was obtained from the patient.

Funding Sources: N/A

Abstract #90

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Ministry Demands and Depressive Symptoms Among Adult Ministry Spouses

Vocational ministry often functions more as a lifestyle than a typical profession, with the demands of ministry affecting the entire family. This study examined depressive symptoms among adult ministry spouses and whether growing up in a ministry household was associated with current depressive symptoms. The study also examined perceived congregational expectations regarding time as a potential source of stress.

An anonymous online survey was completed by 269 adult ministry spouses recruited through social media. Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9). An independent-samples t-test compared PHQ-9 scores between spouses who did and did not grow up in a ministry household. There was no significant difference in PHQ-9 scores between ministry spouses who grew up in a ministry household and those who did not, $t(265) = -0.216$, $p = .829$.

A one-way analysis of variance (ANOVA) examined differences in PHQ-9 scores based on perceived congregational expectations regarding time. Perceived congregational time expectations were significantly associated with depressive symptoms, $F(3, 265) = 7.237$, $p < .001$, partial $\eta^2 = .076$. Participants who reported that congregational demands occupied all of their time had higher PHQ-9 scores than those who reported that demands occupied none, some, or most of their time. Bonferroni-adjusted comparisons indicated that these differences were statistically significant.

Growing up in a ministry household was not associated with current depressive symptoms among adult ministry spouses in this sample. However, perceived congregational expectations regarding time were associated with depressive symptom severity.

IRB or IACUC Approval Number: 2096125

Funding Sources: N/A

Abstract #91

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Anti-VEGF-Refractory Neovascular AMD with Bilateral Choroidal Neovascularization Secondary to Antiphospholipid Syndrome: Resolution with Plasmapheresis and Anti-Complement Therapy

Purpose: To describe a case of bilateral choroidal neovascularization (CNV) with persistent subretinal fluid (SRF) and pigment epithelial detachment (PED) refractory to anti-vascular endothelial growth factor (anti-VEGF) therapy in a patient with antiphospholipid syndrome (APS) who improved after plasmapheresis and treatment with eculizumab.

Observations: A 55-year-old White male presented with bilateral CNV and underwent treatment with multiple anti-VEGF agents over 2.5 years, including faricimab, aflibercept, and bevacizumab, as well as photodynamic therapy. Despite more than 25 bilateral intravitreal injections, visual acuity declined from 20/50 in both eyes to 20/400 bilaterally. Optical coherence tomography (OCT) consistently demonstrated persistent subretinal fluid and pigment epithelial detachment, creating diagnostic uncertainty between neovascular age-related macular degeneration and central serous chorioretinopathy. Following a hemorrhagic stroke, systemic evaluation revealed APS and chronic kidney disease. The patient subsequently underwent plasmapheresis followed by treatment with eculizumab. After therapy, the patient reported subjective visual improvement. OCT showed regression of bilateral PED and improvement in SRF, while best-corrected visual acuity improved to 20/150 OD and 20/300 OS. Anti-VEGF injections were discontinued.

Conclusions: This case suggests that complement-mediated retinal disease should be considered in patients with APS and treatment-refractory bilateral CNV. Improvement following plasmapheresis and eculizumab, after failure of multiple anti-VEGF agents and photodynamic therapy, highlights the potential role of targeted complement inhibition and emphasizes the importance of evaluating for underlying systemic autoimmune disease in atypical or refractory retinal pathology.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #92

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CORI-Assisted Aseptic Revision Total Knee Arthroplasty Demonstrates an Operative Efficiency Learning Curve With Stable Radiographic Precision

Background: Robotic-assisted revision total knee arthroplasty (rTKA) is increasingly adopted, but data on operative learning curves and radiographic restoration during implementation of imageless systems are limited. This study evaluated operative efficiency, radiographic restoration patterns, and early clinical outcomes during adoption of CORI-assisted aseptic rTKA compared with manual rTKA.

Methods: Retrospective single-institution cohort study of patients undergoing manual or CORI-assisted aseptic rTKA from 2017–2025. Outcomes included operative time, length of stay, 30- and 90-day readmission, manipulation under anesthesia (MUA), re-revision, postoperative range of motion, and radiographic restoration (joint line difference [JLD], posterior condylar offset difference [PCOD]). Learning curves were assessed by case-number analysis and early-versus-late adoption comparisons.

Results: Ninety-one manual and 65 CORI aseptic rTKAs were included (mean follow-up 2.33 years).

Operative time improved progressively with case number (Spearman rho = -0.50, $p < 0.001$); median time decreased from 172 minutes in early CORI cases to 148 minutes in later cases, versus 170 minutes for manual rTKA ($p < 0.001$). No significant temporal trends were seen for JLD, PCOD, or outlier frequency during adoption (all $p > 0.05$). CORI showed a distinct directional restoration pattern, with manual cases trending toward joint-line lowering and CORI toward slight elevation (mean JLD -1.18 vs +1.25 mm, $p = 0.009$). Absolute JLD, PCOD, outlier rates, length of stay, readmissions, MUA, and re-revision were comparable (all $p > 0.05$).

Conclusions: CORI-assisted rTKA showed a progressive operative-efficiency learning curve with stable radiographic precision. Robotic assistance altered directional restoration without measurably changing radiographic accuracy or short-term outcomes, suggesting the learning curve primarily involves workflow efficiency rather than restoration precision

IRB or IACUC Approval Number: 2205529-2

Funding Sources: N/A

Abstract #93

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Familial Angiolipomatosis: A Report of Two Cases and Review of Clinicopathologic Features, Diagnostic Considerations, and Management Challenges in an Underserved Population

Angiolipomas are benign mesenchymal tumors composed of mature adipose tissue with proliferative capillary vessels. Most cases are sporadic, presenting shortly after puberty as one or two small, painful “lumps” under the skin, followed by the appearance of two or three more each year, for several years. However, familial forms are rare and occur during the third through fifth decades of life on the trunk and extremities, with the forearms representing a common site of involvement. These lipomas generally affect consecutive generations, suggesting an autosomal dominant mode of inheritance, and are characterized by multiple, well-encapsulated, oval-to-round subcutaneous rubbery lipomas that range from a few millimeters to 25 centimeters in size and can often be misdiagnosed as neurofibromas.

We report cases of two patients who presented with multiple painful angiolipomas that involved the arms, with lesions ranging up to 5 cm in size, and multiple smaller lesions were present as well. Both patients reported pain and physical discomfort, leading to functional impairment. Excision and biopsy were performed, and histopathologic examination confirmed features consistent with angiolipoma, including vascular proliferation, mature adipocytes, and fibrin microthrombi, along with a family history supporting an autosomal dominant influence. This case report aims to highlight that familial multiple angiolipomatosis remains a poorly characterized condition, with limited data on its geographic distribution and population prevalence. Appalachia is an underrepresented region in rare disease literature and is characterized by unique demographic and healthcare access factors that may contribute to delayed diagnosis or underrecognition. This case report provides regional context and serves as a hypothesis-generating contribution toward understanding potential geographic patterns of this rare disorder. Early recognition is important in avoiding misdiagnosis, facilitating appropriate counseling, and guiding management.

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Funding Sources: N/A

Abstract #94

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Multisystem Immune-Related Adverse Events Following Pembrolizumab: A Case of Concurrent Interstitial Nephritis and Drug-Exacerbated Psoriasis

Immune checkpoint inhibitors (ICIs) have significantly improved outcomes in advanced malignancies but can lead to immune-related adverse events (irAEs) by disrupting peripheral immune tolerance. Although cutaneous toxicities are the most common irAEs, renal involvement is increasingly recognized, with ICI-associated nephritis representing an important cause of ICI-related acute kidney injury. Management becomes particularly challenging when multiple steroid-refractory irAEs occur simultaneously. We present the case of a 75-year-old woman with metastatic clear cell renal cell carcinoma who developed severe acute kidney injury approximately two months after initiating pembrolizumab and lenvatinib. Despite discontinuation of pembrolizumab and treatment with high-dose corticosteroids, she had persistent probable ICI-related nephritis/AKI (ASCO 2021 criteria, CTCAE grade 4, KDIGO stage 3), prompting initiation of mycophenolate mofetil, which was discontinued because of severe diarrhea ultimately attributed to medication effect and diverticulitis rather than ICI colitis. Following nephrectomy, she experienced recurrent kidney injury accompanied by hypereosinophilia and a biopsy-supported flare of pre-existing psoriasis with eosinophilic infiltrates. Given intolerance to mycophenolate and concurrent multisystem immune-related toxicities, infliximab was initiated as steroid-sparing therapy. Following treatment, her psoriasis improved markedly and diarrhea resolved; however, renal function did not recover, and she remains hemodialysis-dependent. This case highlights the systemic nature of ICI-induced immune dysregulation and the diagnostic and therapeutic challenges posed by concurrent multisystem irAEs. It also demonstrates the potential role of infliximab as a steroid-sparing therapeutic option in carefully selected patients with refractory immune-related toxicities involving multiple organ systems.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #95

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¹Biomedical, JCESOM

Measuring Dopamine Release in Mice Exposed to Nicotine-Containing Formulations Containing WS-3 and WS-23 Cooling Agents

Flavor additives in electronic nicotine delivery systems (ENDS) can increase the abuse liability of nicotine, yet the neurobiological mechanisms underlying these effects remain incompletely understood. As restrictions on menthol have expanded, synthetic cooling agents such as WS-3 and WS-23 have emerged as common substitutes in commercial ENDS products. The present study examined how these synthetic coolants alter mesolimbic dopamine signaling and nicotine-induced nicotinic acetylcholine receptor (nAChR) plasticity. Male and female C57BL/6J mice underwent chronic vapor exposure to nicotine-containing formulations with or without WS-3 or WS-23. Dopamine release within the nucleus accumbens (NAc) core was quantified using fast-scan cyclic voltammetry (FSCV), while confocal microscopy was used to assess nicotine-induced nAChR upregulation in ventral tegmental area (VTA) dopamine neurons. FSCV recordings demonstrated that nicotine formulations containing WS-3 or WS-23 significantly enhanced electrically evoked dopamine release relative to nicotine alone under both tonic (5 Hz) and phasic (60 Hz) stimulation paradigms. The magnitude of these increases was comparable to that observed following exposure to menthol-containing nicotine formulations, suggesting that synthetic cooling agents similarly potentiate mesolimbic dopamine transmission. Confocal imaging further revealed that WS-3 and WS-23 enhanced nicotine-induced upregulation of nAChRs on VTA dopamine neurons compared with nicotine alone, indicating that synthetic coolants amplify nicotine-dependent receptor plasticity within the mesolimbic reward pathway.

Together, these findings demonstrate that synthetic cooling agents enhance dopamine signaling and nicotine-induced cholinergic adaptations in reward-related brain circuits. These neurobiological effects parallel those produced by menthol and provide mechanistic evidence that WS-3 and WS-23 may increase the addiction liability of nicotine-containing ENDS products.

IRB or IACUC Approval Number: 664

Funding Sources: DA050717 and DA060846

Abstract #96

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Treatment of Hepatitis C With Antiviral Therapy While On Concurrent Antiepileptic Therapy: A Case Study

Introduction: Hepatitis C is an acute or chronic, but curable condition that affects the liver. It is not a vaccine-preventable disease. It is mostly transmitted person to person. Chronic Hepatitis C can cause jaundice, dark-colored urine, fatigue, and ascites. Epilepsy, on the other hand, is a condition where seizures occur due to abnormal electrical signaling in the brain. The purpose of this case study is to highlight and provide guidance on the uncommon occurrence of treating Hepatitis C in a patient with medication-controlled epilepsy.

Case Description: We present a case that involves a 60-year-old female who was diagnosed with both epilepsy and Hepatitis C. The patient's epilepsy treatment regimen consisted of both phenobarbital and carbamazepine. These medications have a significant interaction with glecaprevir-pibrentasvir. Due to CYP induction, this leads to decreased serum concentrations of glecaprevir-pibrentasvir. The patient was well-controlled on her regimen for treating epilepsy, and therefore, neither medication was discontinued. The patient was then started on glecaprevir-pibrentasvir while concurrently taking phenobarbital and carbamazepine.

Discussion: The patient remained compliant and finished the 8-week regimen of glecaprevir-pibrentasvir. About 12 weeks after completion of her treatment, a Sustained Virologic Response (SVR12) was assessed at Marshall Health's Erma Byrd Clinic. On assessment, the patient had an undetectable viral load despite being on antiepileptics. Current literature is limited in terms of whether patients can clear Hepatitis C while on antiepileptics. In our case study, this patient was successful in clearing the virus despite concerns of decreased glecaprevir-pibrentasvir serum concentrations.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #97

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Racial Disparities in Hospitalization Outcomes Among Patients with Transcatheter Aortic Valve Replacement and Amyloidosis

Background: Amyloidosis is associated with worse outcomes in patients who have had a transcatheter aortic valve replacement (TAVR) procedure; however, disparities in race that exist among this patient population have not been explored. We examined the racial disparities in hospitalization outcomes among patients with TAVR and amyloidosis.

Methods: The National Inpatient Sample (NIS) data collected from 2016 – 2020 was used to conduct retrospective cohort analyses. Multivariate logistic and linear regression models were used to examine the association between race/ethnicity and mortality, elective admissions, length of stay, and total hospital charges.

Results: Being Black (AOR: 1.80; 95% CI: 1.10-2.40) and Hispanic (AOR: 2.54; 95% CI: 1.30-3.40) was associated with a higher risk of death versus routine discharge compared to Whites. Also, Blacks (AOR: 1.60; 95% CI: 1.10-2.10) and Hispanics (AOR: 1.20; 95% CI: 1.03-1.60) were 60% and 20% respectively, more likely to have a length of stay greater than 5 days relative to their White counterparts. Conversely, compared to the Whites, Blacks (AOR: 0.35; 95% CI: 0.10-0.69), and other races/ethnicities (AOR: 0.23; 95% CI: 0.10-0.80) were less likely to be admitted electively. Additionally, Blacks (B: \$1,564.8; 95% CI: 86.5-56,425.9) and other races/ethnicities (B: \$36,426.3; 95% CI: 12,752.5-92,591.5) had higher total hospital charges compared to White with TAVR and amyloidosis.

Conclusion: Patients with TAVR and amyloidosis have been shown to have higher morbidity and mortality. This study highlights disparities in various hospitalization outcomes in this patient cohort. Awareness of these racial disparities among healthcare providers can lead to more informed and equitable decision-making.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #98

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³Tug River Health Family Medicine

Impacts of Water Quality and Public Health in the Context of Coal Mining Activity in Wyoming County, WV: An Observational Study

Private well users in Wyoming County, West Virginia have reported concerning changes in household water quality, including discoloration, unusual odors, and, in several cases, reportedly ignitable well or tap water. Given the region's extensive history of coal mining, contamination related to active or abandoned mine sites is an important environmental and public health concern. Acid mine drainage and other mining-related processes can alter water chemistry and mobilize metals into surrounding groundwater and surface water. This observational pilot study aims to evaluate household water quality in Wyoming County and explore associations between measured contaminants, proximity to mining activity, and self-reported health concerns. Water samples collected from participating households will be analyzed for arsenic, lead, cadmium, mercury, iron, manganese, and sulfate, as well as pH and conductivity. Results will be compared with applicable drinking-water standards and guidelines and evaluated for geographic patterns in relation to nearby mining activity.

Previous studies have reported increased rates of adverse health outcomes in Appalachian mining communities, but household-level exposure data remain limited. By pairing environmental sampling with resident health information, this study seeks to identify potential patterns of exposure and areas where additional investigation may be warranted. Findings may help residents better understand their household water quality, support future environmental remediation efforts, and provide preliminary data for further research on mining-related water contamination and health in Appalachian communities.

IRB or IACUC Approval Number: 2389582-1

Funding Sources: WV Rural Research Grant

Abstract #99

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Varicella Zoster Virus Rhombencephalitis Presenting as a Posterior Circulation Stroke Mimic Diagnosed Without Advanced Neuroimaging

Background: Varicella zoster virus (VZV) is a recognized cause of viral encephalitis but rarely presents as isolated brainstem meningoencephalitis (rhombencephalitis). Clinical manifestations may closely resemble posterior circulation stroke, creating significant diagnostic challenges, particularly when advanced neuroimaging is unavailable.

Case Presentation: A 77-year-old man with type 2 diabetes mellitus and myasthenia gravis presented with one week of progressive left facial weakness, gait instability, vertigo, diplopia, dysmetria, and recurrent falls. Initial evaluation favored a brainstem lacunar infarct; however, MRI and CT angiography could not be performed because cervical spine disease and anesthetic-induced bradycardia precluded imaging. On hospital day four, vesicular lesions were identified within the left external auditory canal, raising suspicion for Ramsay Hunt syndrome. The following day, the patient developed meningeal signs, and cerebrospinal fluid demonstrated lymphocytic pleocytosis with positive VZV polymerase chain reaction, confirming VZV brainstem meningoencephalitis. Persistent sinus bradycardia suggested associated autonomic brainstem involvement. Treatment with intravenous acyclovir and methylprednisolone resulted in rapid improvement in facial weakness, extremity strength, speech, gait, and otalgia.

Conclusion: This case highlights VZV rhombencephalitis as a rare stroke mimic and emphasizes the importance of careful neurologic localization and thorough physical examination, including inspection of the external ear. When advanced neuroimaging cannot be obtained, characteristic clinical findings combined with CSF PCR may establish the diagnosis and permit timely antiviral therapy. Persistent unexplained bradycardia may represent an underrecognized clinical clue to medullary involvement in VZV brainstem infection.

IRB or IACUC Approval Number: None, case report

Funding Sources: None

Abstract #100

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Antifungal Assessment of Menadione Derivatives

Introduction. The emergence of antifungal resistance among clinically important fungal pathogens highlights the need for new antifungal agents. Menadione (MEN), a redox-active naphthoquinone, has demonstrated antifungal activity that may be influenced by structural modification of its naphthoquinone scaffold. This study evaluated the antifungal activity of menadione derivatives and investigated the potential contribution of oxidative stress to the antifungal effects.

Methods. The antifungal activities of MEN and the derivatives were evaluated using the broth microdilution assay to measure minimum inhibitory concentrations (MICs). The effects of glutathione (GSH) were evaluated using checkerboard and growth-curve assays, while intracellular oxidative stress was assessed using the fluorogenic probe DCFH-DA.

Results. MEN and derivative NAP4 exhibited notable antifungal activity against *Candida* spp. *Cryptococcus neoformans*, and *Aspergillus fumigatus*, with NAP4 (MIC 2-8 µg/mL) demonstrating equivalent or greater potency than MEN (MIC 2-16 µg/mL). Growth-curve analysis confirmed both agents delayed *Candida albicans* growth by 8 hours. Additionally, MEN and NAP4 increased intracellular oxidant levels in *Candida albicans* when compared with the untreated control. NAP4 produced a greater fluorescence response than MEN, suggesting increased oxidative stress. In the checkerboard studies, GSH produced indifferent or antagonistic interactions with MEN and NAP4 in *C. albicans*. In the growth-curve assay, *C. albicans* growth occurred at earlier timepoints for cultures co-treated with GSH.

Conclusions. MEN and NAP4 demonstrated inhibitory and fungicidal activity against clinically relevant fungal pathogens. The modulation of antifungal activity by GSH and increased ROS-associated fluorescence support a potential contribution of oxidative stress to the antifungal effects of MEN and NAP4.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #101

~¹Wooten, Benjamin, ¹Zafar, Salvia, ¹Huffman, Andrew, ²Pallavi, Fnu, ²Rupp, David, ³Jasko, John.

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Vertical Shear Distal Tibia Fracture Mimicking an Ankle Sprain in an Adolescent Basketball Player: A Case Report

Ankle injuries are common among adolescent athletes with ligamentous sprains having the highest incidence. However, clinically subtle fractures may occur despite preserved weight-bearing ability and a relatively reassuring examination. This case highlights a 15-year-old male basketball player who sustained an inversion injury to his right ankle during a game. He developed immediate pain and swelling and was initially evaluated by an athletic trainer, who suspected an ankle sprain. The following morning, he presented to a sports medicine clinic fully weight bearing without an assistive device. Examination demonstrated moderate swelling and focal medial malleolar tenderness with negative ligamentous and syndesmotic provocative testing. Radiographs revealed a nondisplaced vertical shear fracture of the medial distal tibia involving the medial malleolus, distal tibial physis, and articular surface without comminution. Because of concern for instability and articular congruity, referral was made to an orthopedic surgeon. The patient underwent ORIF with concomitant ankle arthroscopy to address the fracture. At approximately 10 weeks, the patient was pain-free, had resumed running and limited basketball activity, and demonstrated complete radiographic healing with maintained alignment. This case emphasizes that preserved weight-bearing ability does not exclude clinically important fracture in adolescent athletes and highlights the value of focused examination, appropriate imaging, timely orthopedic referral, and structured return-to-sport progression.

IRB or IACUC Approval Number: IRB approval was not required for this single-patient case report in accordance with institutional policy. Written informed consent was obtained from the the patient's legal guardian. IACUC approval was not applicable because no animals were involved.

Funding Sources: N/A

Abstract #102

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Delayed Management of a Tongue-Type Calcaneal Fracture Resulting in Posterior Heel Ulceration: A Case Report

Tongue-type calcaneal fractures are characterized by displacement of the posterior calcaneal tuberosity, which can place significant tension on the overlying posterior heel soft tissues and result in rapid skin compromise. This case describes a 70-year-old male with severe diabetic neuropathy who felt a sudden snap and immediate pain in the right heel while walking at home. He presented to an outside emergency department where radiographs demonstrated a severely displaced tongue-type calcaneal fracture. He was placed into a splint and instructed to follow up with orthopedic surgery as an outpatient; however, no appointment was arranged. Four days later, he returned to the same emergency department with fever and was found to have developed a 3 × 4 cm ulcer over the proximal posterior heel near the Achilles tendon. He was subsequently transferred to our facility for definitive management. The patient underwent open reduction and internal fixation of the right calcaneus with two 5.5-mm headless compression screws in addition to debridement of the posterior heel wound. His severe diabetic neuropathy and absent sensation likely limited recognition of progressive skin injury. This case highlights the time-sensitive nature of displaced tongue-type calcaneal fractures and the importance of urgent orthopedic evaluation and reduction. Definitive management within 24 hours should be considered when significant posterior displacement threatens the soft-tissue envelope to reduce the risk of skin necrosis, ulceration, and wound complications.

IRB or IACUC Approval Number: IRB approval was not required for this single-patient case report in accordance with institutional policy. Written informed consent for publication was obtained from the patient. IACUC approval was not applicable because no animals were involved.

Funding Sources: N/A

Abstract #103

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Growth Differentiator Factor 15 (GDF15): A Novel Predictor and Therapeutic Target of Intestinal Fibrosis

Intestinal fibrosis and strictures are common complications of inflammatory bowel disease (IBD), including Crohn's disease (CD) and ulcerative colitis (UC). Although chronic inflammation is required for fibrogenesis, controlling inflammation does not prevent or reverse fibrosis, suggesting inflammation-independent mechanisms. Growth differentiation factor 15 (GDF15), a TGF- β superfamily member implicated in fibrosis of the liver, lung, and kidney, is strongly associated with IBD, but its role in intestinal fibrosis remains unclear. Adherent invasive *E. coli* (AIEC), a CD-associated pathogen, has also been implicated in fibrosis progression; whether AIEC and GDF15 interact to promote fibrogenesis is unknown. We hypothesize that altered GDF15 expression and activity in the inflamed or AIEC-infected intestine contribute to intestinal fibrosis. We assessed GDF15 expression in small-intestinal mucosa and organoids from SAMP1/YitFc and TNF Δ ARE mice, established CD models, and their respective controls. GDF15 levels were also measured in Caco-2 monolayers treated with TNF α or IL-1 β and infected with AIEC LF-82. Effects of recombinant human (rh) GDF15 on the mRNA levels of myofibroblast/ECM markers in CCD18-Co fibroblasts were evaluated. GDF15 protein levels were significantly elevated in SAMP1/YitFc and TNF Δ ARE mice, and in SAMP1 versus AKR ileal organoids. TNF α , IL-1 β , and AIEC infection increased GDF15 in Caco-2 cells. rhGDF15 treatment increased the mRNA levels of α SMA and Col1A1 in CCD18-Co fibroblasts. These results suggest that GDF15 is elevated in inflamed and AIEC-infected intestine and may promote myofibroblast generation and extracellular matrix formation, identifying GDF15 as a potential novel driver and therapeutic target in intestinal fibrogenesis.

IRB or IACUC Approval Number: 860

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Abstract #104

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When Joint Pain Isn't Lyme Disease: Incidental Discovery of Suspected Primary Hyperparathyroidism in a Radiation-Exposed Operating Room Nurse

Background: Primary hyperparathyroidism (PHPT) is a common endocrine disorder that increasingly presents with subtle, nonspecific symptoms such as fatigue and arthralgia rather than classic skeletal or renal manifestations. Its musculoskeletal presentation can mimic inflammatory, infectious, or rheumatologic conditions, delaying recognition in primary care.

Case Presentation: A 58-year-old female operating room nurse with over 30 years of fluoroscopic radiation exposure presented with polyarticular aching, fatigue, and right hand swelling following two recent tick bites. Initial evaluation for infectious, inflammatory, rheumatologic, and thyroid disease was unrevealing. Lyme serology, antinuclear antibody, rheumatoid factor, inflammatory markers, and thyroid-stimulating hormone were unremarkable; however, comprehensive metabolic testing demonstrated borderline hypercalcemia. Subsequent evaluation revealed a markedly elevated parathyroid hormone concentration of 180 pg/mL with normal vitamin D status and preserved renal function, raising concern for PHPT. Cervical ultrasonography demonstrated a 12 × 5 × 5-mm hypoechoic lesion posterior to the right thyroid lobe concerning for an enlarged parathyroid gland or adenoma. The patient was referred to endocrinology and otolaryngology for further biochemical confirmation, evaluation of end-organ involvement, localization, and consideration of definitive management.

Conclusion: This case demonstrates how investigation of a subtle biochemical abnormality during evaluation of nonspecific symptoms can uncover clinically significant endocrine disease. The patient's longstanding occupational fluoroscopy exposure is additionally noteworthy given historical associations between ionizing radiation and parathyroid adenomas; however, available evidence is insufficient to establish a causal relationship with occupational fluoroscopy exposure. This case emphasizes careful evaluation of unexplained calcium abnormalities and avoidance of premature diagnostic closure in primary care.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #105

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Atypical Ocular Neurosyphilis Presenting as Progressive Bilateral Vision Loss with Posterior Column Involvement

Rates of syphilis have increased substantially in recent years, yet the true burden of neurosyphilis remains poorly characterized. Ocular syphilis, a subset of neurosyphilis, may involve any part of the eye with diverse findings. We present an atypical case of ocular neurosyphilis with bilateral progressive vision loss and posterior column involvement in an otherwise healthy young adult.

A 34-year-old male presented with 6 months of painless, progressive bilateral vision loss, initially characterized by persistent visual haze and subsequently progressing to peripheral visual field disturbances. During this period, he also developed episodic diffuse muscle stiffness, night sweats, malaise and a nonpruritic truncal and extremity rash. Three days before admission, he developed acute worsening of vision and could only perceive shapes. Ophthalmologic examination demonstrated hand-motion visual acuity and mild bilateral optic disc edema. MRI revealed a small right parietal white-matter T2/FLAIR hyperintensity and subtle dorsal spinal cord T2 hyperintensity with normal orbits. Serum RPR was reactive at 1:256 with positive treponemal antibodies. CSF demonstrated lymphocytic pleocytosis (63 WBC/uL), elevated protein (79 mg/dL) and reactive VDRL (1:4) - confirming neurosyphilis. Broad autoimmune, neoplastic and infectious evaluation was unrevealing. The patient improved significantly following initiation of IV penicillin G.

This case highlights the diverse neurologic and ocular manifestations of neurosyphilis. Progressive bilateral vision loss with relatively subtle ocular findings and concurrent posterior column involvement may obscure the diagnosis. Syphilis should remain in the differential for unexplained visual or neurologic abnormalities, regardless of disease stage or perceived epidemiological risk.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #106

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Pleural Fluid Cytology in a SMARCA4-Deficient Undifferentiated Thoracic Tumor: A Diagnostic Challenge

SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A member 4-deficient undifferentiated thoracic tumor (SMARCA4-UTT) is a rare, highly aggressive malignancy that is often difficult to diagnose due to its varied clinical presentation, which can mimic other thoracic infectious and malignant conditions. We report the case of a 62-year-old male who initially presented with progressive shortness of breath and a right pleural effusion suspected to be related to infection. Cytologic evaluation of the pleural fluid showed atypical epithelioid cells, while immunohistochemical studies yielded nonspecific findings, thus preventing a definitive diagnosis. Despite pleural drainage, the patient's symptoms persisted, prompting thoroscopic surgery with pleural decortication. Histological findings revealed a poorly differentiated infiltrating malignant epithelial neoplasm. Genomic profiling revealed a truncating SMARCA4 alteration with loss of BRG1 expression, which confirmed a diagnosis of SMARCA4-UTT. Because of the aggressive nature and poor prognosis associated with this malignancy, timely diagnosis is critical but remains challenging due to the overlapping features this tumor shares with other thoracic malignancies. This case demonstrates the limitations of pleural fluid cytologic evaluation as a standalone diagnostic tool. It also emphasizes the importance of cytohistologic correlation and comprehensive molecular testing to establish a timely, definitive diagnosis of SMARCA4-UTT and help facilitate earlier and more appropriate management.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #107

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Appalachian evening primrose (*Oenothera biennis*) promotes longevity and protects against neurodegeneration in *Caenorhabditis elegans*

Oenothera biennis (evening primrose) contains diverse bioactive phytochemicals with potential health-promoting properties, yet the contributions of individual plant tissues to longevity and neuroprotection remain unclear. In this study, ethanol extracts (100-500 µg/ml) from leaves (PRLE), stems (PRSE), and roots (PRRE) of Appalachian evening primrose collected in West Virginia were evaluated in *Caenorhabditis elegans* models.

All ethanol extracts significantly extended lifespan and enhanced resistance to juglone-induced oxidative stress in wild-type worms, whereas hexane extracts showed no beneficial effects. Survival increased by 35-116% with PRLE, 72-95% with PRSE, and 81-103% with PRRE relative to juglone-treated controls. Health span was assessed by measuring pharyngeal pumping rates in aging worms. On day 12 of adulthood, PRLE, PRSE, and PRRE increased pumping rates by 59.7%, 74.6%, and 57.9%, respectively, indicating preserved neuromuscular function during aging. Neuroprotective effects were more selective. In the human tau-expressing strain KAE112, only PRSE and PRRE improved survival under oxidative stress, increasing survival by 50-59% compared with untreated controls. Consistently, PRSE and PRRE improved chemotaxis in the neuronal A β -expressing strain CL2355 and delayed paralysis in the muscle A β -expressing strain CL4176, increasing the area under the paralysis curve by 43% and 109%, respectively. These findings demonstrate that leaf, stem, and root extracts broadly promote longevity and stress resistance, while neuroprotective activity is primarily associated with stem and root tissues, potentially due to enrichment of triterpenoids such as β -sitosterol and oenotheralanosterols A and B. Appalachian evening primrose represents a promising source of compounds that support healthy aging and protect against age-related neurodegenerative diseases.

IRB or IACUC Approval Number: N/A

Funding Sources: Appalachian Natural Products Research Program; USDA award 58-6060-2-006

Abstract #108

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FFR-CT Prior to Coronary Angiography and Cardiovascular Outcomes in a Rural Appalachian Population: A Propensity Score-Matched Analysis

Background: Fractional flow reserve derived from coronary CT angiography (FFR-CT) provides noninvasive anatomic and physiologic assessment of coronary artery disease (CAD). Prior trials demonstrated improved detection of hemodynamically significant stenoses and reduced unnecessary invasive angiography, but real-world performance, particularly in rural populations, remains poorly defined.

Objectives: To evaluate 3-year outcomes in patients undergoing coronary angiography with versus without prior FFR-CT at a rural Appalachian tertiary center and nationally.

Methods: This retrospective study used propensity score-matched cohorts from a single-center electronic medical record and the TriNetX Research Network. At the rural center, 750 FFR-CT patients were matched 1:1 with 750 controls; nationally, 1,951 matched pairs were analyzed. Matching incorporated demographic, clinical, and laboratory characteristics. Outcomes included all-cause mortality, major adverse cardiovascular events (MACE), myocardial infarction (MI), stroke, heart failure, ICU utilization, and stent placement.

Results: FFR-CT was associated with lower mortality (rural, 8.0% vs 16.0%; national, 5.8% vs 9.7%), MACE (20.0% vs 28.0%; 19.9% vs 37.5%), and MI (9.3% vs 13.3%; 9.9% vs 28.5%), all $P < 0.05$. Heart failure was reduced nationally (24.8% vs 35.0%) but not significantly rurally. Stroke rates were similar. ICU utilization was higher with FFR-CT rurally (21.3% vs 14.7%) but not different nationally. Stent placement was unchanged rurally and modestly increased nationally.

Conclusion: Across two independent matched real-world cohorts, FFR-CT was associated with lower 3-year mortality, MACE, and MI, supporting its clinical utility and incorporation of CT-derived physiologic assessment into CAD evaluation. Residual confounding cannot be excluded; prospective validation is warranted.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #109

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The Mass Behind the Missteps: Medulloblastoma Behind Chronic Ataxic Gait

Background: Medulloblastoma is the most common malignant pediatric brain tumor and often presents with signs of ataxic gait and increased intracranial pressure. Recognition may be delayed when gait abnormalities predate other symptoms.

Case Presentation: A 7-year-old boy with ADHD and longstanding gait instability presented after two weeks of rapidly worsening imbalance, daily falls, recurrent vomiting, and severe occipital headaches that occurred in the morning and awakened him from sleep. Examination demonstrated marked truncal and appendicular ataxia, impaired tandem gait, mild lower-extremity hypertonia, and preserved strength, sensation, and cranial nerve function. Brain MRI revealed a 5×4×5 cm heterogeneous cystic and solid enhancing midline posterior fossa mass with restricted diffusion, fourth-ventricular obstruction, supratentorial hydrocephalus, transependymal cerebrospinal fluid flow, and downward cerebellar tonsillar displacement. While awaiting transfer, he developed persistent vomiting, refractory severe headache, and hypertension concerning for worsening intracranial pressure and received mannitol. He was air-lifted to a higher-level pediatric neurosurgical center. Subsequent histopathologic evaluation confirmed pediatric medulloblastoma.

Conclusion: This case highlights the importance of recognizing new or progressive red-flag symptoms, including morning or nocturnal headache, recurrent vomiting, and accelerating ataxia, even when a child has a chronic gait abnormality. Avoiding diagnostic anchoring and obtaining timely neuroimaging can expedite neurosurgical care for posterior fossa tumors.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #110

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BBS12 and TTC21B Variants of Uncertain Significance: A Potential Novel Bardet-Biedl Genotype

Background: Bardet-Biedl syndrome (BBS) is a rare autosomal recessive ciliopathy with age-dependent, multisystem manifestations that may delay recognition when classic findings are incomplete.

Case: A 10-year-old boy with ADHD and chronic migraine developed severe pediatric obesity, increasing from 47 kg (BMI 23.98, 98th percentile) to 60.2 kg (BMI 30.85, >99th percentile) within nine months. His course was complicated by persistent hypertension, with home measurements as high as 170/127 mm Hg and an emergency-department measurement of 148/92 mm Hg, mild dyslipidemia, gastroesophageal reflux, constipation, and recurrent nonexertional chest pain. Genetic testing identified variants of uncertain significance in BBS12 and TTC21B, both ciliopathy-associated genes, prompting evaluation for BBS. CBC, comprehensive metabolic panel, thyroid studies, hemoglobin A1c, urinalysis, renal ultrasonography, brain MRI, electrocardiography, echocardiography, and ambulatory rhythm monitoring were unrevealing. No retinal dystrophy or polydactyly was documented. Hypertension improved after initiation of lisinopril alongside lifestyle counseling. Genetics consultation was obtained, and broader genomic testing remains pending.

Conclusion: This case illustrates the diagnostic uncertainty of a possible attenuated or evolving BBS phenotype when metabolic and neurobehavioral manifestations precede or occur without recognized classic features. Variants of uncertain significance should not be treated as diagnostic; however, a compatible phenotype should prompt longitudinal ophthalmologic, renal, endocrine, and genetic surveillance. Definitive molecular clarification may guide counseling and multidisciplinary management.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #111

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Malignancy-Associated Hemophagocytic Lymphohistiocytosis in Adults: A Systematic Review of Treatment Outcomes and Mortality

Background: Malignancy-associated hemophagocytic lymphohistiocytosis (M-HLH) is a rapidly progressive hyperinflammatory syndrome with high mortality and no clearly established optimal treatment strategy. Evidence regarding treatment selection and timing remains fragmented, particularly across malignancy subtypes.

Objective: To systematically evaluate treatment strategies, clinical outcomes, and predictors of mortality among adults with M-HLH.

Methods: This protocol was prospectively registered with PROSPERO (CRD420261439205). MEDLINE, PubMed, Embase, Scopus, CINAHL, and Google Scholar will be searched without date or language restrictions. Eligible studies will include adults aged 18 years or older with HLH secondary to a hematologic or solid malignancy. Retrospective and prospective observational studies, randomized trials, and case series of at least three patients will be included; isolated case reports and studies without extractable treatment data will be excluded. Two reviewers will independently screen studies, extract data, and assess methodological quality using Joanna Briggs Institute tools or the Newcastle-Ottawa Scale. Primary outcomes are all-cause in-hospital mortality and overall treatment response. Secondary outcomes include intensive care unit admission, time to treatment initiation, hospital length of stay, and relapse. When appropriate, pooled mortality and response proportions will be estimated using random-effects meta-analysis. Subgroup analyses will compare hematologic versus solid malignancies and etoposide-based, ruxolitinib-based, and other treatment strategies. Sensitivity analyses will exclude studies at high risk of bias, and certainty of evidence will be evaluated using GRADE.

Conclusion: This review will clarify contemporary treatment outcomes in adult M-HLH, identify factors associated with survival and treatment failure, and define priorities for future prospective studies.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #112

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Country Roads and Cancer Care: Comparing Network- and Centroid-Based Measures of Travel Distance Among Patients with Bladder Cancer

Introduction: Travel distance affects access to care and clinical outcomes, but measurement methods vary. This study evaluated travel burden as measured by travel distance among non-muscle-invasive bladder cancer (NMIBC) patients using different distance estimation approaches.

Methods: We conducted a retrospective cross-sectional study of 376 NMIBC patients undergoing transurethral resection of bladder tumor between 2018 and 2022 at a tertiary center. Travel distance was estimated via centroid-based ZIP code calculations (ArcGIS) and network-based routing (Google Maps). Agreement between methods was assessed using Bland-Altman analysis, and misclassification, defined as discordance in patient assignment between centroid- and network-based quartile travel bands, was examined in relation to demographics, clinical management, and survey-reported transportation concerns. Subgroup analyses considered rurality outcomes.

Results: Network- and centroid-based distance estimates differed by a mean of 38.5% (95% CI, 34.3–42.7) with poor agreement (median difference, 5.8 miles). Centroid-based measures misclassified 16% of patients, disproportionately affecting rural residents (96.7% vs. 85.2%, $p=0.02$). Misclassified patients experienced longer median time to repeat TURBT 63.0 [IQR: 42.0-70.0] vs. 50.0 [IQR: 49.0-85.5] days, $p=0.02$).

Conclusion: Using centroid-based travel distances alone to model clinical outcomes could lead to over-optimistic assumptions about access to care, especially in highly rural and mountainous areas.

IRB or IACUC Approval Number: 23-974

Funding Sources: N/A

Abstract #113

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Robotic-Assisted Laparoscopic Closure of the Internal Ring for Scrotal Dialysate Leaks in Patients Undergoing Continuous Ambulatory Peritoneal Dialysis: Case Reports and Review of the Literature

Background: Scrotal dialysate leaks are an uncommon but clinically significant complication of continuous ambulatory peritoneal dialysis (CAPD). They may cause substantial morbidity and require temporary conversion to hemodialysis. Traditional management involves open inguinal hernia repair to avoid an internal peritoneal defect. We describe robotic-assisted laparoscopic internal ring closure for scrotal dialysate leaks without clinically apparent hernias.

Cases: Two male patients, 67 and 83, developed scrotal edema after one and more than three years of CAPD, respectively. Neither had palpable inguinal hernias, and both experienced low-flow or low-volume dialysis alarms. Robotic exploration demonstrated an enlarged right internal ring. The internal ring was closed in a purse-string fashion using 0 Stratafix suture, with closure limited to the peritoneum and avoiding spermatic cord structures. CAPD was resumed without reduction in fill volume on the day of surgery in one patient and the following day in the other.

Results: Scrotal edema resolved in both patients without perioperative complications, dialysis interruption, recurrent leakage, or development of a clinically apparent hernia. After four months of CAPD in one patient and six weeks in the other, neither experienced dialysis-related difficulties or recurrence.

Conclusion: Robotic-assisted laparoscopic internal ring closure was successful and complication-free in two CAPD patients with scrotal dialysate leaks and no clinically apparent hernia. This novel technique may provide a safe and effective alternative to open inguinal hernia repair, allowing continued CAPD without reducing fill volumes or requiring temporary hemodialysis. This approach should be considered for scrotal dialysate leaks in CAPD patients without an obvious hernia.

IRB or IACUC Approval Number: None required

Funding Sources: N/A

Abstract #114

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Circulating Extracellular Vesicles Mediate Cerebrovascular Endothelial Dysfunction in Inflammatory Bowel Disease

Inflammatory bowel disease (IBD) is increasingly recognized as a systemic inflammatory disorder associated with numerous extraintestinal complications. Epidemiological studies report a 15-30% increased risk of cerebrovascular complications, including ischemic stroke in IBD patients even in the absence of traditional vascular risk factors. However, the mechanisms linking intestinal inflammation to cerebrovascular injury remain poorly understood. Extracellular vesicles (EVs) are circulating mediators of intercellular communication that transport inflammatory cargo capable of influencing vascular function at distant sites. We hypothesized that plasma-derived EVs from patients with IBD promote cerebrovascular endothelial dysfunction by inducing endothelial activation and disrupting barrier integrity.

Methods: Large EVs were isolated from plasma obtained from IBD patients and applied to human brain microvascular endothelial cells (HBMECs) for 24 hours. Protein expression of endothelial activation markers, NF- κ B phospho-p65, and tight junction proteins were assessed by Western blot analysis.

Results: Exposure of HBMECs to IBD-derived EVs resulted in significant upregulation of ICAM-1, VCAM-1, NF- κ B phospho-p65 expression (n=4, p<0.05), indicating a heightened inflammatory endothelial phenotype. Concurrently, levels of Claudin-5 and ZO-1 were significantly reduced (n=4, p<0.05), suggesting disruption of endothelial tight junctions and compromised barrier integrity. These observations demonstrate that circulating EVs from patients with IBD directly promote endothelial activation, vascular inflammation, and barrier dysfunction within the cerebral microvasculature.

Conclusions: Our findings support a role for plasma-derived EVs as systemic mediators linking intestinal inflammation to cerebrovascular endothelial dysfunction in IBD. By driving inflammatory signaling and weakening barrier function, EVs may contribute to the increased risk of stroke observed among IBD patients.

IRB or IACUC Approval Number: 860

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Abstract #115

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Rate of Manipulation Under Anesthesia With Use of Immediate Postoperative Continuous Passive Motion After Primary Fertilized Anterior Cruciate Ligament Reconstruction With Quadriceps Autograft: A Retrospective Comparative Study

Purpose: To compare manipulation under anesthesia (MUA) rates after primary fertilized quadriceps tendon (QT) autograft anterior cruciate ligament reconstruction (ACLR) with versus without immediate postoperative continuous passive motion (CPM), and examine sex as a secondary risk factor.

Methods: Primary fertilized QT autograft ACLR procedures at a single institution (January 2018–July 20, 2025) were retrospectively grouped by CPM use; the cutoff ensured ≥ 12 months' follow-up for all. The primary outcome was ≥ 1 post-ACLR MUA. Fisher exact tests assessed primary and sex-based comparisons, the Welch t test compared follow-up, and exploratory Firth penalized logistic regression evaluated CPM, era, and sex.

Results: Among 285 procedures (71 CPM, 214 no-CPM; 120 female, 165 male; mean age, 18.9 ± 4.4 years), MUA was lower with CPM (0.0%, 0/71) than without (6.5%, 14/214; $P = .025$). Females underwent MUA more often than males (8.3% vs 2.4%; OR, 3.64; 95% CI, 1.02–16.32; $P = .028$). All 14 events (4.9%) occurred within 6 months. Mean follow-up was 45.6 ± 19.2 months (range, 12.9–92.0), shorter with CPM (26.3 ± 6.3 vs 52.0 ± 17.7 months; $P < .001$). After adjustment, CPM was associated with lower odds of MUA (adjusted OR, 0.024; 95% CI, 0.00016–0.34; $P = .005$) and female sex with higher odds (adjusted OR, 4.92; 95% CI, 1.55–19.05; $P = .006$).

Conclusions: CPM was associated with a lower MUA rate, and female sex with greater MUA risk. The small event count, absence of CPM-group events, and nonrandomized era-based exposure warrant cautious interpretation.

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Funding Sources: N/A

Abstract #116

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Low-Magnitude Bone Tunnel Enlargement and Favorable Patient-Reported Outcomes After Biologically Augmented All-Inside Quadriceps Tendon Anterior Cruciate Ligament Reconstruction

Purpose: To quantify tibial and femoral tunnel diameter change at six-month MRI and describe patient-reported outcome (PRO) trajectories after biologically augmented all-inside quadriceps tendon autograft anterior cruciate ligament reconstruction (ACLR).

Methods: We retrospectively reviewed a single-surgeon registry of patients undergoing all-inside quadriceps tendon ACLR augmented with bone marrow aspirate concentrate, demineralized bone matrix, autograft bone, and suture tape. Tunnel diameters were recorded intraoperatively and on six-month MRI. PROs (KOOS JR, KOOS-QoL, KOOS Global, IKDC, ACL-RSI, VAS pain) were collected postoperatively. Change was assessed with Wilcoxon signed-rank and paired t tests (Cohen dz), disaggregated by sex.

Results: Among 68 patients (37 male, 31 female; age 19.2 years), tibial tunnels enlarged from 9.89 ± 0.50 to 10.66 ± 0.57 mm (+0.77 mm; 95% CI, 0.60–0.94; dz = 1.12; $P < .001$) and femoral tunnels from 10.33 ± 0.59 to 10.85 ± 0.90 mm (+0.52 mm; 95% CI, 0.28–0.76; dz = 0.53; $P < .001$). Enlargement occurred in 86.6% of tibial and 70.1% of femoral tunnels, did not differ by sex (both $P > .4$), and was inversely related to initial tunnel size (tibial $r = -0.59$; femoral $r = -0.44$; both $P < .001$). PROs improved through one year (IKDC 53.8 to 88.1; KOOS JR 73.3 to 88.8; ACL-RSI 47.8 to 70.6; VAS pain 2.0 to 0.8).

Conclusions: Biologically augmented ACLR produced less than 1 mm of mean tunnel enlargement, with only one tunnel exceeding 13 mm and no clinically meaningful widening; PROs improved steadily through one year.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #117

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Stress Reactions in All 5 Toes of a Young Cross-Country Runner: A Case Report

Stress reactions are overuse bone injuries caused by repeated mechanical loading, resulting in accumulated microdamage without sufficient time for repair. They are among the most common injuries in sports medicine, particularly in runners and military recruits. Although they can occur in the upper extremities, they most frequently involve the lower extremities. Stress reactions involving the toes are uncommon and typically limited to the sesamoids or a single digit. We report a rare case of stress reactions involving all five toes in a young competitive runner.

A 19-year-old female collegiate cross-country runner presented with a two-week history of progressive right great toe pain that initially occurred with running and later with walking. Physical examination revealed mild great toe pain on the plantar aspect, and radiographs were unremarkable, leading to an initial diagnosis of sesamoiditis. Persistent symptoms prompted MRI, which demonstrated diffuse bone marrow edema throughout the phalanges of all five toes without fracture lines, consistent with stress reactions from repetitive overuse. The patient was treated conservatively with protected weight-bearing in a CAM boot, activity modification, and a gradual return-to-running program. Symptoms completely resolved, and she returned to unrestricted competition without recurrence.

Because radiographs are frequently normal, stress reactions are often overlooked, particularly when they occur in uncommon locations. Clinicians should maintain a high index of suspicion in athletes with persistent toe pain and obtain MRI when indicated. Early diagnosis and appropriate conservative management can facilitate a timely return to play while preventing progression to fracture and the need for surgery.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #118

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Assessing the Need for Gender-Affirming Surgery in Southern West Virginia

Purpose: To evaluate demand for gender-affirming surgery (GAS) and perceived barriers to care among LGBTQ+ individuals residing in and around West Virginia, a predominantly rural Appalachian region.

Methods: A cross-sectional anonymous survey was conducted between April and December 2025 using a 13-item Qualtrics questionnaire. Adults aged ≥18 years were recruited through convenience sampling using community organizations, university outreach, and a gender-affirming care clinic. Descriptive statistics were used to summarize participant characteristics, surgical interest, and barriers to care. Associations between participant characteristics and outcomes were evaluated using Pearson chi-square or Fisher's exact tests.

Results: A total of 251 participants completed the survey. Among respondents who answered the surgical interest question, 58.9% reported interest in at least one gender-affirming surgical procedure. Overall, 19.6% reported they would be likely to pursue GAS if available. Perceived importance of GAS differed significantly across age, gender identity, prior surgical consultation, surgical interest, and likelihood of pursuing surgery (all $p < 0.001$). Overall, 29.6% of respondents reported at least one barrier to obtaining GAS. Cost and insurance limitations were the most frequently reported barriers, followed by lack of providers, geographic location, and social stigma.

Conclusion: Demand for GAS exists among LGBTQ+ individuals in rural Appalachia, yet substantial financial, geographic, provider, and social barriers continue to limit access to care. These findings support efforts to improve access to knowledgeable providers, expand insurance coverage, and reduce structural barriers to gender-affirming surgical care in rural and underserved communities.

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Funding Sources: N/A

Abstract #119

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Utilizing Spatial Transcriptomics and Immunohistochemistry to Demonstrate Tripartite Synapse Maturation Relative to Gene Expression Across Development

Adolescent development is a crucial period of synaptic maturation that is necessary for efficient cognitive function. These synapses are composed of a pre-synaptic and post-synaptic terminal that are ensheathed by a peripheral astrocyte process (PAP); creating the tripartite synapse. We have previously demonstrated that adolescent intermittent ethanol exposure (AIE), a model of adolescent binge drinking, disrupts the proximity of PAPs and synapses within the orbitofrontal cortex (OFC) in a subregion dependent manner. We predict that differential vulnerability is driven by differences in subregional maturation state. However, little is known about the timing of OFC tripartite maturation and when synaptic ensheathment by PAPs occurs. To investigate if ventral OFC (vOFC) and lateral OFC (lOFC) have unique temporal maturation profiles, mice were sacrificed at three developmental stages: postnatal day (PND) 30, 46, and 72. Brains were collected for immunohistochemistry (IHC) and imaged using stimulated emission depletion (STED) microscopy. PAP-synaptic proximity was quantified to determine distances across the tripartite synapse. Additional slices were prepared for spatial transcriptomics (ST) using Visium HD (10x Genomics). Our results demonstrate that female PND 30 vs. PND 72 mice showed a significant increase in PAP-synaptic distance across both vOFC and lOFC, with more robust changes within the vOFC. Spatial transcriptomics identified 28 transcriptionally defined clusters, two of which have been identified as astrocyte clusters. Downstream processing will involve CellChat to map cellular interactions and identify pathway-level activity. Ongoing data analysis will distinguish the temporal PAP-synaptic structural and transcriptomic changes occurring within normal development to inform future AIE studies.

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Abstract #120

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AI-Driven Cell Type Annotation for Spatial Transcriptomics

Accurate cell-type annotation is essential for interpreting spatial transcriptomics data, yet it remains challenging when clusters are defined by limited marker genes. Large language models (LLMs) can integrate biological knowledge with marker-gene context to generate detailed cell-type predictions, whereas reference-based tools rely on curated marker databases. The consistency of these approaches for spatial transcriptomic annotation has not been well characterized. We processed Visium HD spatial transcriptomics data from formalin-fixed paraffin-embedded (FFPE) C57BL/6 mouse brain sections (N=14) using Space Ranger and Seurat for quality control, normalization, clustering, and marker-gene identification. The top 10 marker genes from each of 28 clusters were independently evaluated by different LLMs (ChatGPT, Codex, and Gemini) and by Reference-based models. LLM predictions were harmonized into common cell classes, and consensus annotations were assigned based on inter-LLM agreement. Reference-based model such as Enrichr results were compared separately for agreement with the LLM consensus. The three LLMs showed strong agreement for most of the 28 clusters. High-confidence annotations included astrocytes, microglia, endothelial cells, oligodendrocytes, oligodendrocyte progenitor cells, interneuron subtypes, mural cells, and fibroblasts. Disagreement was mainly observed in broad neuronal clusters, mixed neuronal-glial domains, and closely related cell states. Enrichr frequently supported the broad lineage but often produced less specific or off-tissue annotations. Multi-LLM consensus yielded detailed and biologically coherent cell-type annotations. Enrichr provided a useful independent reference but was less reliable for fine-grained subtype identification. Combining LLM consensus with marker expression and spatial validation may improve annotation confidence in spatial transcriptomics studies.

IRB or IACUC Approval Number: IRB was not required.

Funding Sources: NSF Cooperative Agreement No. OIA-2242771

Abstract #121

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Refractory Hypertension with Cessation of Levodopa Therapy Prior to Deep Brain Stimulator Surgery

Parkinson's disease (PD) is the second most common neurodegenerative disease in the world. The number of patients with Parkinson's (PwP) is increasing, and with this the number of patients undergoing Deep Brain Stimulator (DBS) surgery. At our institution and many others, patients are asked to hold their PD medications the morning of surgery. Parkinsonism-Hyperpyrexia Syndrome (PHS) is known to occur in PwP who abruptly stop their dopaminergic medications, with symptoms that include hypertension, fever, rigidity, autonomic instability, encephalopathy, and elevated CK. We present two patients who were to undergo DBS surgery and stopped their dopaminergic medications, which then led to refractory hypertension and potentially the beginning features of PHS. There is little literature about dopamine's roles in autonomic function and the potential role it plays in PHS. We completed a literature review of dopamine and its role in blood pressure to better understand PHS and potential complications of withholding medication prior to DBS surgery.

IRB or IACUC Approval Number: IRB approval was not required because the project constituted exempt educational/medical research.

Funding Sources: N/A

Abstract #122

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Unusual Signs of VP Shunt Maladjustment in Idiopathic Intracranial Hypertension

Idiopathic intracranial hypertension (IIH, previously known as pseudotumor cerebri) is characterized by elevated intracranial pressure that leads to a wide range and severity of symptoms including headaches and vision changes. This condition is highly associated with obesity, and first-line treatment is weight loss and medical management with drugs such as acetazolamide. While new treatments are being studied, procedures such as lumbar punctures (LPs) and ventriculoperitoneal (VP) shunts remain indicated for severe and refractory cases. These, however, carry their own risk of complications. In this case, we report a 28-year-old female with IIH who underwent a VP shunt placement in 2023 and experienced complications of under-drainage with initial shunt settings, followed by severe complications of over-drainage after shunt adjustment. This patient also experienced several barriers to accessing proper healthcare for management of her condition and shunt, which is an important consideration in many patient populations when formulating a treatment plan. Patients with shunts must be meticulously monitored for changes in intracranial pressure and malfunction of the shunt. Even without shunt malfunction, changes in a patient's overall health status can affect the amount of drainage required, making this an important factor to monitor for long-term outcomes. In patients who have experienced barriers to healthcare, newer medications such as GLP-1 agonists should be considered if they prove less invasive for the patient's long-term treatment and health outcomes.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #123

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Neonatal Atrial Flutter Presenting Within the First Hour of Life: A Case Report and Literature Review

Introduction: Atrial flutter (AFL) is the second most common fetal tachyarrhythmia, accounting for 25–30% of cases and affecting fewer than 0.1% of pregnancies. Although often self-limited, it can cause hemodynamic compromise, hydrops, or tachycardia-mediated cardiomyopathy if unrecognized and is frequently misdiagnosed as supraventricular tachycardia (SVT) on initial ECG.

Case Presentation: A term male neonate (birth weight 4,610 g) was delivered via emergent cesarean section for intrapartum fetal tachycardia. At approximately one hour of life, persistent tachycardia was noted; initial ECG showed a narrow-complex tachycardia at 251 bpm, interpreted as SVT. Vagal maneuvers and three escalating adenosine doses produced only transient rhythm breaks. A repeat ECG obtained during adenosine-induced AV block revealed sawtooth flutter waves with an atrial rate exceeding 400 bpm, confirming atrial flutter. A single synchronized DC cardioversion (0.5 J/kg) restored sinus rhythm. Echocardiography showed a structurally normal heart. The infant was discharged at 48 hours, and two-week follow-up confirmed sustained sinus rhythm without recurrence.

Discussion: Neonatal AFL frequently mimics SVT because rapid ventricular rates obscure diagnostic flutter waves. Although adenosine cannot terminate AV node-independent AFL, it transiently increases AV block and unmasks flutter waves, serving a critical diagnostic role. Synchronized direct current cardioversion is safe and has shown efficacy with success rates over 90%. In isolated cases without structural heart disease or other accessory pathways, antiarrhythmic maintenance medication is frequently not indicated.

Conclusion: This case underlines the diagnostic value of adenosine in revealing neonatal AFL that was misdiagnosed as SVT and highlights the importance of synchronized cardioversion as the definitive curative therapy and of a structured multidisciplinary follow-up, which is essential during the first year of life.

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Funding Sources: N/A

Abstract #124

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Hemiplegic Migraine Without Headache Mimicking Acute Ischemic Stroke in Pregnancy: A Case Report

Background: Hemiplegic migraine is a rare stroke mimic characterized by transient unilateral motor weakness accompanied by visual, sensory, or speech disturbances. Diagnosis is clinical and requires exclusion of acute ischemic stroke and other causes of focal neurologic deficits. The absence of headache further complicates diagnosis. In pregnancy, physiologic changes increase the risk of ischemic stroke, making timely recognition critical.

Case: A 22-year-old woman at 14 weeks' gestation presented with left-sided weakness, facial paresthesias, tongue deviation, and transient visual disturbances without headache or prior migraine diagnosis. Given the concern for acute ischemic stroke, an emergent stroke evaluation was initiated. Computed tomography of the head, CT angiography, and perfusion imaging demonstrated no intracranial processes. She was admitted for further evaluation, including MRI, MRV, EEG, and cardiac workup, all of which were unrevealing for other neurological causes. After ruling out stroke, cerebral venous sinus thrombosis, seizure, and other potential causes of focal deficits, she was diagnosed with hemiplegic migraine. Her symptoms improved, and she returned to baseline at outpatient follow-up.

Conclusion: This case demonstrates the challenge of diagnosing hemiplegic migraine without headache during pregnancy. Because acute ischemic stroke cannot be reliably distinguished from hemiplegic migraine initially, patients with new focal deficits require stroke evaluation. Hemiplegic migraine should remain a diagnosis of exclusion, even in young pregnant patients, to avoid delays in diagnosing and treating potentially life-threatening cerebrovascular events.

IRB or IACUC Approval Number: None required for case report

Funding Sources: N/A

Abstract #125

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Chronic High-Dose Ibuprofen as a Potential Trigger in Delayed-Onset Leber Hereditary Optic Neuropathy: A Case Report

Leber's Hereditary Optic Neuropathy (LHON) is a maternally inherited mitochondrial disorder caused by Complex I dysfunction in the electron transport chain, most commonly associated with one of three pathogenic mitochondrial DNA mutations: m.11778G>A, m.3460G>A, or m.14484T>C. LHON often presents as painless, progressive bilateral vision loss, with male predominance (9:1). Typical onset is between ages 10 and 30, though rare late-onset cases may occur. As a mitochondrial disorder, LHON shows variable penetrance and expressivity, influenced by mitochondrial and tissue-specific heteroplasmy as well as environmental mitochondrial stressors. The presence of a pathogenic mutation alone is insufficient for diagnosis, as many carriers remain asymptomatic. Environmental triggers such as smoking, alcohol, or certain medications have demonstrated phenotypic conversion in susceptible individuals.

We report a 60-year-old male with a one-month history of rapid-onset, painless bilateral vision loss. Examination revealed uncorrectable acuity of 20/400 OD and hand motion OS, trace RAPD OS, temporal disc pallor, and severe dyschromatopsia OU. MRI showed T2 hyperintensity, subtle T1 enhancement, and swelling of the optic chiasm and nerves. OCT demonstrated ganglion cell and RNFL thinning, and visual fields showed central depression OU. Mitochondrial DNA testing confirmed a homoplasmic m.11778G>A mutation. The patient reported chronic high-dose ibuprofen use for osteoarthritis and has family members with LHON.

Treatment with idebenone stabilized further vision loss. We propose that chronic ibuprofen use may have acted as an environmental trigger in this genetically predisposed patient and that earlier genetic counseling might have enabled risk-reduction strategies to prevent phenotypic conversion.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #126

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ALK-Negative Anaplastic Large Cell Lymphoma Masquerading as Periprosthetic Joint Infection Following Revision Total Knee Arthroplasty: A Case Report

Periprosthetic joint infection (PJI) is a well-recognized complication following total knee arthroplasty (TKA). However, persistent, treatment-resistant symptoms despite appropriate therapy should raise suspicion for atypical non-infectious etiologies. While lymphomas have been reported in association with medical hardware, predominantly B-cell malignancies or breast implant-associated ALCL, anaplastic lymphoma kinase (ALK)-negative anaplastic large cell lymphoma (ALCL) involving orthopedic implants is particularly rare. We report a 77-year-old male who presented with recurrent knee pain, swelling, and presumed cellulitis following revision TKA. Despite sterile joint aspirations and broad-spectrum antimicrobial courses, his symptoms progressed alongside regional inguinal lymphadenopathy. Surgical debridement with polyethylene exchange yielded a soft tissue biopsy confirming ALK-negative ALCL, with staging revealing systemic nodal and pulmonary involvement. The patient received targeted chemotherapy with six cycles of brentuximab vedotin plus cyclophosphamide, doxorubicin, and prednisone (BV-CHP), achieving significant symptomatic response with minimal treatment-related toxicity. This case highlights the necessity of considering underlying malignancy in culture-negative, treatment-resistant presumed PJI. Persistent inflammatory findings despite antimicrobial therapy should prompt tissue biopsy to differentiate rare lymphoproliferative disorders from infection and initiate timely therapy.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #127

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Optimizing Warfarin Drug-Drug Interaction Alerts: A Pharmacy-Led Evaluation of Electronic Health Record Severity Classifications

Introduction: Warfarin is a narrow therapeutic index medication susceptible to numerous pharmacokinetic and pharmacodynamic drug interactions that may result in clinically significant alterations in bleeding and thromboembolic risks. Timely identification and communication of these consequential interactions at the point of prescribing are critical to reducing preventable adverse drug events, additional therapeutic intervention, hospitalization, and increased healthcare utilization. Electronic health record (EHR) clinical decision support provides an important safeguard; however, its effectiveness depends on both the identification of clinically relevant interactions and appropriate prioritization of alerts. Interactions classified below the threshold for interruptive notification may fail to adequately alert prescribers, while excessive interruptive warnings may contribute to alert fatigue and diminish clinician responsiveness. This evaluation seeks to identify potential gaps between EHR-based interaction classifications and clinical practice, with the goal of ensuring that consequential warfarin interactions receive appropriate visibility without unnecessarily increasing alert burden. Findings may guide institution-specific clinical decision support optimization and enhance medication safety for patients receiving warfarin therapy.

Methods: A report was generated from the EHR identifying warfarin drug-drug interactions classified as major contraindicated, major, or moderate. Clinical reviewers, including pharmacists practicing across inpatient and outpatient settings are evaluating the interactions for clinical significance and determining whether existing EHR severity classifications are appropriate or warrant escalation to generate higher priority, interruptive alerts.

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Funding Sources: N/A

Abstract #128

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Migraine-like Presentation of Ischemic Stroke Leading to Diagnosis of PFO in Young Adult

Background: Acute ischemic stroke in young adults remains uncommon and is underrecognized, as it can mimic migraine with aura. Patent foramen ovale (PFO) is among the most common causes of cryptogenic stroke in this population, yet the diagnosis is often delayed when clinicians and patients alike attribute new neurologic symptoms to a known migraine history. Recognizing this overlap early is critical, as missed or delayed diagnosis increases the risk of recurrent stroke.

Case Presentation: A 26-year-old male with a history of migraine with aura presented with a two-day history of severe headache, bilateral tinnitus, neck pain, tongue numbness, photophobia, and vision changes. A non-contrast CT-head raised concern for ischemia, prompting brain MRI, which confirmed acute infarcts in the right parietal-occipital and right frontal lobes. A comprehensive stroke evaluation, including transthoracic echocardiography (TTE) with bubble study, identified a 0.36 cm PFO without structural cardiac abnormality. Hypercoagulability and metabolic workups were unremarkable. The patient was started on dual antiplatelet therapy, completed outpatient cardiac monitoring, and underwent successful percutaneous PFO closure with implantable loop recorder placement.

Conclusion: This case study examines the evaluation and diagnosis of stroke in a patient with chronic migraine with aura. Emphasis is placed on similarities and differences in clinical presentation and diagnostic workup with the goal of educating physicians and reducing the likelihood of misdiagnosis.

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Funding Sources: N/A

Abstract #129

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IN VITRO DIHALOBENZENE NEPHROTOXICITY IN ISOLATED KIDNEY CELLS

Brominated and chlorinated benzenes are common industrial chemicals linked to kidney injury. This study evaluated the nephrotoxicity of several mono- and dihalogenated derivatives using isolated kidney cells from male Fischer 344 rats. LDH release and trypan blue exclusion were measured after 30- and 60-minute exposures to vehicle or 0.25–1.0 mM of test compounds. Toxicity increased with increased concentration and longer times. Mixed-halogen bromobenzenes, particularly 1-bromo-4-chlorobenzene showed one of the highest toxicity levels, while 1,4-dichlorobenzene was the most toxic chlorobenzene. Antioxidants (glutathione, ascorbate, and alpha-tocopherol) markedly reduced injury, indicating oxidative mechanisms play role in toxicity. CYP inhibitors (piperonyl butoxide and metyrapone) decreased toxicity, demonstrating that metabolic activation contributed to cell damage. Deferoxamine further reduced injury by limiting iron-driven radical formation. These findings show that halogen substitution patterns strongly influence cytotoxicity and that oxidative stress and CYP-dependent metabolism drive the nephrotoxic response to dihalobenzene exposure.

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Abstract #130

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Isolated Coronal Shear Fracture of the Humeral Trochlea in an Adolescent: A Case Report, Review of Literature and Proposed Classification for Trochlea Shear Fractures

Background: Isolated coronal shear ("Laugier-type") fractures of the humeral trochlea in which the capitellum is spared account for less than 40 reported cases. This rarity comes with difficulties in diagnosis and classification/management. These fractures are often misdiagnosed as capitellar injuries on radiographs, and existing coronal-shear classifications (Bryan-Morrey/McKee, Dubberley) require capitellar involvement. This leaves the injury without a dedicated diagnostic pattern or treatment framework.

Case Report: We present a 17-year-old male who sustained an isolated coronal shear trochlear fracture after falling with his elbow flexed and internally rotated behind his trunk. The injury was initially misdiagnosed as a medial epicondyle fracture on outside radiographs. CT confirmed a mildly comminuted trochlear fragment with the capitellum, radial head, and coronoid spared. He underwent ORIF through a medial approach with three headless compression screws and anterior ulnar nerve transposition for a traumatic cubital tunnel disruption. At three months, he achieved a 10°-120° flexion-extension arc with full, pain-free pronosupination.

Conclusion: We reviewed 32 prior cases (36 patients) and propose a coronoid-impaction mechanism explaining how a flexed elbow injury can fracture the trochlea while sparing the capitellum. To our knowledge, we propose the first treatment-oriented classification for this injury (Type I-IV with a Salvage category, and modifiers for coronoid (+C), distal radius (+D), ligament (+L), and nerve (+N) involvement) to guide fixation and approach based on fracture morphology. This case highlights the need for CT when radiographs suggest a medial epicondyle or capitellar injury with mechanical block, along with surgical and post-operative treatment approach options.

IRB or IACUC Approval Number: No IRB Approval number required, as this is a case report and written consent for publication was obtained by the treating surgeon.

Funding Sources: N/A

Abstract #131

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Multiple Myeloma Mimicking Primary Breast Cancer: A Rare Case of Extramedullary Breast Involvement

Background: Breast masses are most commonly evaluated for primary breast malignancy; however, rare hematologic malignancies can present with similar clinical and radiographic features. Breast involvement by multiple myeloma is uncommon and may closely mimic primary breast carcinoma, creating important diagnostic and therapeutic challenges. Distinguishing these entities is essential because their treatment strategies differ substantially.

Case Presentation: We report the case of a 51 year old woman who initially presented with progressive left hip pain and a concurrent palpable breast mass. Breast imaging demonstrated a suspicious lobulated mass initially concerning for primary breast carcinoma, while evaluation of her hip pain revealed a pathologic femoral neck fracture and multifocal lytic bone lesions. Biopsy of the breast mass and osseous lesions demonstrated a plasma cell neoplasm with CD138 positivity and lambda light chain restriction. Serum protein electrophoresis demonstrated an M-spike of 2.6 g/dL, and bone marrow biopsy showed approximately 30% plasma cell involvement, confirming the diagnosis of multiple myeloma with extramedullary breast involvement. The patient was treated initially with daratumumab, bortezomib, lenalidomide, and dexamethasone, followed by a carfilzomib-based regimen due to disease progression. Although osseous disease demonstrated improvement, the breast lesion progressed, highlighting both the importance of accurate diagnosis and the therapeutic challenges of extramedullary disease.

Conclusion: This case highlights the rare occurrence of breast involvement in multiple myeloma and underscores the aggressive nature and therapeutic resistance often associated with extramedullary disease. Recognition of this uncommon presentation is critical to avoid misdiagnosis as primary breast cancer and to guide appropriate management. Suboptimal responses between extramedullary and osseous disease emphasize the need for early identification and potentially intensified treatment strategies in patients with extramedullary multiple myeloma.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #132

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Recurrent Small Bowel Obstruction Revealing a Jejunoileal Neuroendocrine Tumor

Introduction: Postoperative intra-abdominal adhesions are the most common cause of recurrent small bowel obstruction (SBO). In patients without prior abdominal surgery, recurrent SBO is uncommon and should prompt evaluation for alternative etiologies, including malignancy. Small bowel neuroendocrine tumors (NETs) are indolent neoplasms that may present with recurrent bowel obstruction secondary to bowel stricturing and mesenteric desmoplastic fibrosis, often resulting in delayed diagnosis.

Case Presentation: A 36-year-old woman with relapsing-remitting multiple sclerosis and chronic intractable migraines, but no prior abdominal surgical history, presented with abdominal pain, nausea, and vomiting. CT imaging demonstrated a partial small bowel obstruction with mesenteric edema involving the proximal ileum and jejunum. She was successfully managed with nasogastric decompression, intravenous fluids, and a Gastrografin small bowel follow-through (SBFT). Seven months later, she was readmitted with recurrent SBO. She again passed an SBFT; however, the decision was made to proceed with diagnostic laparoscopy. During this procedure, a stenotic ileal segment was identified and resected. Histopathologic examination revealed a 2.4-cm, unifocal, well-differentiated, jejunoileal neuroendocrine tumor (WHO grade 1, Ki-67 <3%, pT3) with lymphovascular invasion. Immunohistochemistry was positive for synaptophysin and chromogranin. The postoperative course was uncomplicated, and the patient was referred for oncologic management.

Conclusion: Recurrent SBO in patients without a surgical history should raise suspicion for an underlying small bowel malignancy, including NET. Early recognition may reduce diagnostic delay, expedite definitive surgical management, and facilitate timely oncologic referral.

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Funding Sources: N/A

Abstract #133

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Social Media and Rural Maternal Health: Understanding the Role of Social Media Use Throughout Pregnancy in Appalachia

Maternal morbidity and pregnancy-related mortality are disproportionately higher in rural than urban communities (March of Dimes, 2021). Social media is a widely accessible source of health information and may help address pregnancy-related knowledge gaps. This prospective, longitudinal, survey-based study evaluated social media use among pregnant people in Appalachia and identified pregnancy-related topics supplemented by social media. A total of 100 pregnant people receiving care at Marshall Health Obstetrics and Gynecology were enrolled between July 1, 2024, and October 1, 2026. Surveys were administered at four milestones: (1) initial prenatal nurse visit, (2) second trimester, (3) third trimester, and (4) postpartum visit. Demographics, social media platforms, frequency of use, and pregnancy-related topics searched were collected. Baseline demographic and social media data were obtained from all participants, and 70% completed at least two surveys. Overall social media use remained stable throughout pregnancy, with most participants reporting 1–3 hours of daily use (42.2%–54.2%), although pregnancy-specific use was lower. TikTok and Facebook were the primary platforms used for pregnancy-related information, and topics searched evolved with gestational age. Breastfeeding/bottle feeding, diet, nutrition, fitness, and medication safety were the most frequently searched topics across pregnancy. Approximately half of participants followed non-medical accounts (43.3%–48.1%), while nurses were the most followed credentialed source (42.2%–47.5%). Perceived information accuracy did not differ by age, education, parity, or history of pregnancy complications. These findings highlight the importance of social media as a pregnancy health resource and the opportunity to improve patient communication in rural Appalachia and beyond.

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Funding Sources: N/A

Abstract #134

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Metastatic Gastric Signet-Ring Cell Adenocarcinoma Masquerading as Primary Cholangiocarcinoma: A Case Report

Introduction: Gastric cancer remains a leading cause of cancer-related mortality worldwide, typically presenting with nausea, vomiting, epigastric pain, and weight loss. Signet cell and mucinous variants are particularly aggressive with an unfavorable prognosis. We present a rare case of advanced gastric signet-ring cell adenocarcinoma presenting with findings consistent with acute calculus cholecystitis, illustrating the diagnostic challenge of atypical presentations.

Case Presentation: A 52-year-old male presented to the ED with postprandial RUQ and epigastric pain radiating to the right scapula, nausea and vomiting, and weight loss over four months. RUQ US findings were consistent with acute calculus cholecystitis. Following cholecystectomy, gallbladder pathology revealed invasive poorly differentiated carcinoma with signet cell/mucinous features involving the cystic duct margin. CT scans were negative for metastasis, but PET scan revealed GE junction wall thickening. EGD with biopsies was negative for malignancy. During attempted curative resection, multiple omental and small bowel nodules were identified, along with a large GE junction and lesser curvature continuous indurated mass confirming stage IV disease and precluding resection.

Conclusion: This case highlights the diagnostic challenge of metastatic gastric cancer masquerading as benign biliary disease, emphasizing that signet-ring cell carcinoma should prompt evaluation for a gastric primary, given the rarity of primary gallbladder signet-ring cell carcinoma. This presentation also demonstrates that infiltrative gastric cancers may have normal-appearing mucosa on endoscopy. In retrospect, EUS may have identified an infiltrative gastric lesion not shown on conventional EGD. A high index of suspicion is essential as early evaluation can significantly impact prognosis and treatment.

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Funding Sources: N/A

Abstract #135

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Diagnostic Complexity in Infective Endocarditis

This case illustrates the diagnostic complexity that arises when severe diabetic ketoacidosis, sepsis, and infective endocarditis converge in a person who injects drugs, producing overlapping clinical syndromes that initially mimic acute coronary syndrome and obscure the underlying infectious etiology.

The initial presentation of diffuse ST-segment elevations on ECG and markedly elevated high-sensitivity troponin I (1,223 ng/L) raised immediate concern for ST-elevation myocardial infarction. The serial troponin values of 1,223 ng/L at presentation, 1,302 ng/L at 1 hour, and 999 ng/L at 3 hours demonstrated a plateau-to-declining pattern that was critical in excluding type 1 MI.

The single most important diagnostic maneuver in this case was the emergent bedside transthoracic echocardiogram. In this patient, TTE revealed two pivotal findings: (1) preserved left ventricular function without regional wall motion abnormalities, effectively ruling out significant coronary territory ischemia, and (2) P2 mitral valve thickening suspicious for vegetation, immediately redirecting the diagnostic evaluation from ACS to infective endocarditis.

This patient demonstrated simultaneous embolization to four organ systems: multifocal cerebral infarcts (left cerebellum, frontal, and parietal lobes), a cavitory pulmonary nodule consistent with septic embolism, wedge-shaped splenic infarction, and the peripheral Osler-like lesions.

Together, these findings illustrate how the integration of point-of-care imaging, biomarker interpretation, and careful physical examination can rapidly pivot a diagnosis from ACS to infective endocarditis, enabling timely initiation of appropriate antimicrobial therapy and a comprehensive evaluation for embolic complications.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #136

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***Serratia marcescens* contributes to macrophage death via purine overload**

During infection, neutrophils release neutrophil extracellular traps (NETs) to trap pathogens. NETs are composed of decondensed chromatin and decorated with around 30 different proteins including neutrophil elastase, myeloperoxidase, and cathelicidin. Certain Gram-positive and Gram-negative bacteria carry a 5'-nucleotidase capable of cleaving NETs-derived DNA or nucleoside monophosphates into deoxynucleotides. The generation of deoxynucleotides can contribute to deoxypurine overload in some cell types, and macrophages are particularly sensitive to deoxypurine-induced cell death. Purine overload, which results in apoptosis, occurs when there is an excess of purines in a cell due to excessive influx or metabolic trapping. *Serratia marcescens*, a multidrug resistant Gram-negative opportunistic nosocomial pathogen, encodes a periplasmic 5'-nucleotidase, *ushA*, and has been proposed to generate deoxypurines from NETs-derived DNA and nucleoside monophosphates. We demonstrated that *S. marcescens* readily produces deoxyguanosine (dGuo) and deoxyadenosine (dAdo) when exposed to 2'-deoxyguanosine 5'-monophosphate (dGMP) and 2'-deoxyadenosine 5'-monophosphate (dAMP) as substrates. Similarly, heterologous expression of *S. marcescens* *UshA* in *Escherichia coli* cells also resulted in the generation of deoxypurines in the presence of dGMP or dAMP. Exposure of undifferentiated THP-1 monocytes or differentiated macrophage-like (dTHP-1) cells to dGMP or dAMP did not affect cell viability. Interestingly, dAdo or dGuo treatment resulted in cell death in dTHP-1 macrophages, but not in undifferentiated monocytes. Future studies will be focused on understanding the balance between effective pathogen clearance and macrophage cell death during infection.

IRB or IACUC Approval Number: N/A

Funding Sources: NASA West Virginia Space Grant Consortium, Grant # 80NSSC25M7079; NIH R03AI175783

Abstract #137

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MOG Antibody-Associated Disease Presenting as Spinal Predominant Acute Disseminated Encephalomyelitis without Encephalopathy Following Meningococcal Vaccination: A Rare Adolescent Case Report

MOG antibody-associated disease (MOGAD) is an immune-mediated demyelinating disorder of the central nervous system with a broad spectrum of clinical presentations, including acute disseminated encephalomyelitis (ADEM), optic neuritis, myelitis, and cortical encephalitis. The ADEM phenotype occurs most commonly in young children following infection, whereas cases temporally associated with vaccination are rare. We report the case of a 17-year-old female who developed progressive urinary retention, bowel dysfunction, sensory loss, and impaired temperature sensation following meningococcal vaccination without encephalopathy or other neurocognitive symptoms. Magnetic resonance imaging demonstrated longitudinally extensive, non-enhancing T2 hyperintense lesions involving the cervical and thoracic spinal cord with a focal lesion in the left anterolateral medulla. Cerebrospinal fluid analysis demonstrated lymphocytic pleocytosis with elevated protein and normal glucose, and serum testing was positive for myelin oligodendrocyte glycoprotein immunoglobulin G (MOG-IgG), supporting a diagnosis of MOG antibody-associated disease presenting with a spinal cord-predominant ADEM phenotype that initially mimicked other inflammatory myelopathies. Treatment with intravenous methylprednisolone followed by an oral corticosteroid taper resulted in marked neurologic improvement and complete resolution of symptoms at outpatient follow-up. This case highlights the importance of recognizing an atypical, spinal cord-predominant ADEM phenotype in adolescents presenting with acute myelopathy and autonomic dysfunction despite the absence of encephalopathy, particularly when symptoms occur in temporal association with vaccination, allowing for prompt diagnosis and appropriate treatment.

IRB or IACUC Approval Number: N/A

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Abstract #138

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Depression Levels and Perceived Church Encouragement of Mental Health Treatment

Christian ministry is a lifestyle and profession that impacts not only ministers but their families as well. Ministry families may be expected to engage in specific duties to supplement their minister's involvement in the church. These duties and expectations may add stress to this public-facing family unit. Ample research exists on the impact of the ministry lifestyle on ministers' mental health and well-being, but research on its impact on ministry spouses is lacking. This study examined whether depressive symptoms differed based on whether participants reported that their church or denomination encouraged seeking mental health care. An anonymous online survey was completed by 269 adult ministry spouses recruited through social media. Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9). An independent-samples t-test showed that spouses who reported encouragement to seek mental health care had lower PHQ-9 scores ($M = 16.40$, $SD = 5.56$) than those who did not ($M = 19.20$, $SD = 6.38$), $t(267) = -3.40$, $p < .001$, Cohen's $d = 0.49$. Despite this difference, mean PHQ-9 scores for both groups fell within the moderately severe range. These findings indicate that ministry spouses who reported greater encouragement to seek mental health care also reported fewer depressive symptoms, although depressive symptoms were elevated across both groups.

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Funding Sources: N/A

Abstract #139

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The Gut-Vascular Axis: Microbiome Dysbiosis and Endothelial Dysfunction Across Cardiovascular, Neurologic, Obstetric, and Retinal Disease

Gut microbiome imbalances have been linked as a mechanism underlying systemic vascular disease. Alterations in microbial composition, intestinal permeability, and microbiome byproducts can induce chronic inflammation, oxidative stress, and endothelial dysfunction. Inflammation, oxidative stress, and endothelial dysfunction play a role in many vascular conditions such as cardiovascular disease, ischemic stroke, preeclampsia, and retinal vascular disease/pathology. However, there are limited articles that discuss these diseases together through gut-mediated pathways. Gut dysbiosis has been shown to drive processes in cardiology by affecting hypertension, atherosclerosis, and poor cardiometabolic outcomes. In neurology, gut dysbiosis affecting the gut-brain axis can cause neurologic sequela such as inflammation and ischemic stroke. In obstetrics, gut dysbiosis can cause negative vascular outcomes within the mother such as preeclampsia through altered vascular function, systemic inflammation, and placental dysfunction. Lastly, changes in the microbiome have also been associated with multiple retinal diseases such as diabetic retinopathy and hypertensive retinopathy. The retina serves as a microvascular structure within the eye that can act as a visible representation of systemic vascular injury. In this review, we will analyze microbiome dysbiosis as it relates to endothelial dysfunction and microvascular damage in the brain, heart, placenta, and retina. Although current prevention and treatment strategies focus on traditional risk factor modification, microbiome-targeted approaches may offer new opportunities for prevention and therapeutic management. Future directions for prospective longitudinal studies are needed to identify if the microbiome, inflammatory biomarkers, and retinal vascular imaging can aid in earlier risk assessment and intervention for patients with systemic vascular disease.

IRB or IACUC Approval Number: N/A

Founding Sources: N/A

Abstract #140

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FLCN-Mutated Renal Neoplasm Unmasking Birt-Hogg-Dubé Syndrome Misdiagnosed as Lymphangi leiomyomatosis

Birt-Hogg-Dubé syndrome (BHD) is an autosomal dominant tumor-predisposition disorder caused by germline pathogenic variants in the folliculin gene (FLCN), characterized by a triad of cutaneous fibrofolliculomas, multiple pulmonary cysts with spontaneous pneumothorax, and renal tumors of varied histology (Menko et al., Lancet Oncology, 2009; Daccord et al., European Respiratory Review, 2020). Because its cystic lung disease can mimic lymphangi leiomyomatosis (LAM), patients are frequently mislabeled, with consequences for oncologic surveillance. We describe a 61-year-old woman carried for years under a diagnosis of "lymphangiomyomatosis" who was ultimately confirmed to have BHD when a screening renal MRI led to biopsy of an FLCN-mutated renal epithelial oncocytic neoplasm.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #141

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Recurrent Aseptic Glenoid Baseplate Failure with Absent Osseointegration and Adverse Local Tissue Reaction in a Patient on Continuous PD-1 Blockade (Pembrolizumab): Salvage with Hemiarthroplasty

Immune checkpoint inhibitors such as pembrolizumab (anti-PD-1) are vital to oncologic care, yet their influence on prosthetic osseointegration remains poorly characterized. Since PD-1 signaling helps regulate osteoclast-osteoblast homeostasis, checkpoint blockade may theoretically compromise implant fixation. We present a 69-year-old man with a well-functioning index left reverse total shoulder arthroplasty (rTSA, 2020) who developed HPV-mediated oropharyngeal squamous cell carcinoma with pulmonary recurrence, managed with chemoradiation and continuous pembrolizumab monotherapy from September 2024. The index baseplate subsequently failed without trauma, with fractured screws, metallosis, and glenoid bone loss. Revision rTSA (September 2025) achieved documented excellent intraoperative fixation, with negative cultures. Nonetheless, it failed again within approximately seven months during uninterrupted pembrolizumab, demonstrating recurrent baseplate migration, a broken screw, extensive metallosis, and no bony ingrowth on the baseplate. Infectious markers and intraoperative cultures were repeatedly negative, and permanent histopathology showed no acute inflammation with special stains negative for bacterial, mycobacterial, and fungal organisms, effectively excluding periprosthetic infection and supporting an aseptic etiology. The joint was salvaged with a hemiarthroplasty in July 2026. Together, these findings support a biologic rather than technical etiology, PD-1 impaired osseointegration compounded by particle-induced osteolysis from metallosis, with screw fracture as a downstream consequence. The absence of bony ingrowth despite excellent initial fixation is particularly striking. This case suggests that checkpoint inhibitor therapy warrants consideration in the differential for unexplained aseptic loosening.

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Funding Sources: N/A

Abstract #142

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Quality of Life Improvement Following Free Hearing Aid Provision in an Underserved Appalachian Population

Hearing loss is associated with reduced social engagement, emotional well-being, and overall quality of life, particularly when untreated. The effects of hearing loss are magnified in rural and underserved populations, where financial limitations and barriers to health care access make treatment less attainable.

To analyze quality-of-life improvements resulting from hearing aids provided to low-socioeconomic-status patients at a free health care clinic in rural Appalachia. This retrospective observational study evaluated changes in quality of life following hearing aid use. Participants were adults aged 18 years or older with documented sensorineural hearing loss who received free hearing aids through Ebenezer Medical Outreach in Huntington, West Virginia. Of 21 patients who received hearing aids, 15 completed follow-up surveys. Participants were fitted with hearing aids programmed to their individual audiometric profiles by licensed audiologists. Participants completed a 15-item Likert-scale survey after using hearing aids for approximately 1 year and 3 months, reflecting on quality of life before and after intervention.

Improvements were observed across multiple domains following hearing aid use. Median satisfaction with hearing in daily life increased from 1 to 4 ($p = 0.0005$), and confidence when speaking on the phone or listening to media improved from 2 to 4 ($p = 0.0181$). Fourteen of 15 participants (93%) continued using their hearing aids.

Providing hearing aids to low-income individuals in a rural Appalachian population was associated with significant improvements in communication, social interaction, emotional well-being, and mental health.

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Abstract #143

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Is Butyrate Beneficial in Diabetic Infection? Post-Infection Treatment Worsens Clinical Outcomes in Hyperglycemic High-Fat Fed Mice

Type 2 Diabetes (T2D) affects 11.3% of people in the United States while 15% of West Virginians live with the disease. T2D has systemic effects, including intestinal barrier dysfunction (“leaky gut”), making diabetics more vulnerable to foodborne pathogens such as *Salmonella enterica* serovar Typhimurium (Stm). Butyrate, a short-chain fatty acid made by microbiota and taken as a nutritional supplement, may improve intestinal epithelial integrity and reduce inflammation. We employed the TALLYHO (TH) mouse model of T2D to evaluate infection with Stm and whether butyrate improves infection outcomes.

Mice were placed on a high fat diet (HFD) or standard chow for 8 weeks followed by oral Stm infection and daily treatment with vehicle or butyrate for four to five days prior to euthanasia. To simplify analysis, only hyperglycemic High Fat Diet (HFD) mice and normoglycemic chow mice were included. HFD significantly increased Tumor Necrosis Factor α (TNF α), serum Lipopolysaccharide (LPS), and Interleukin-6 (IL-6), and decreased colon length compared to chow diet. Within the uninfected group, butyrate treatment significantly reduced LPS and increased Aryl hydrocarbon receptor (AhR) activation, but did not affect serum IL-6 or colon length. While chow mice benefited from butyrate treatment during infection (decreased clinical score, IL-6; increased colon length compared to vehicle), HFD mice treated with butyrate paradoxically had worse clinical scores compared to vehicle-treated mice.

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Funding Sources: WV-INBRE Chronic Disease Research Program (NIH P20GM103434); WVCTSI (NIH U54GM104942); NASA WVSGC # 80NSSC25M7079

Abstract #144

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Mediastinal Mass and 90% Tracheal Stenosis: Emergency Tracheal Stenting as a Life-Saving Bridge

A patient with a large mediastinal mass causing severe mass effect on the trachea and esophagus presented with critical hypoxia (SpO₂ in the 30s) and lethargy. CT imaging confirmed 90% tracheal stenosis. Intubation was deferred at the transferring facility due to mass effect. Upon arrival, anesthesia stabilized the patient via ketamine induction and LMA placement, maintaining spontaneous ventilation to avoid catastrophic collapse with sedatives and relaxation. Interventional pulmonology performed emergency bronchoscopy, deploying a tracheal stent to relieve extrinsic and endobronchial obstruction. The patient was successfully intubated through the stent lumen for definitive management. This case highlights intrathoracic lesion physiology and airway emergency management.

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Funding Sources: N/A

Abstract #145

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Loss of Heparan Sulfate N-deacetylase/N-sulfotransferase Induces Retinal Pigmented Epithelial Dysmorphia

Age-related macular degeneration (AMD) is the leading cause of vision loss in the elderly in industrialized nations. Heparan sulfate (HS) chains are covalently attached to core proteins in proteoglycans and are abundant components of Bruch's membrane, the site of early drusen deposition in AMD. Lipoproteins exhibit a strong affinity for HS; specific sulfation of heparan sulfate chains facilitate lipoprotein binding. We hypothesize that reduction of sulfation of HS will reduce lipoprotein aggregation within Bruch's Membrane and ameliorate dysmorphia of the Retinal Pigmented Epithelium (RPE). To potentiate RPE dysmorphia, NDST1 deficiency was induced in mice with LDLR or APOE4 genetic background and either high fat or regular diet. To detect dysmorphia, the retina was sectioned and stained for cell membranes and nuclei using ZO-1 tight junction protein. To determine if genetic background and feeding regime affected plasma levels, cholesterol and triglyceride levels were measured.

It was expected to see more normal cells in the retinas of NDST1 deficient mice.

As expected, the APOE4^{-/-} mice had significantly lower cholesterol and triglyceride levels than the LDLR^{-/-} mice, all of whom were on an atherogenic diet. Despite this, their retinas showed more damage in flat mount imaging. Though there was no significant difference between LDLR^{-/-} Cre⁺ and Cre⁻ mice, both have significantly more normal cells than APOE^{-/-} mice, showing that NDST1 loss could be a factor in larger populations.

IRB or IACUC Approval Number: S23028 UCSD

Funding Sources: NIH, Shiley Eye Institute, UC San Diego Health Viterbi Family Department of Ophthalmology

Abstract #146

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Simplified Radiologist-Directed Bolus-Only Ketamine Sedation Protocol for Pediatric Interventional Radiology

Interventional radiology (IR) procedures in children often require general anesthesia, which can lead to delayed care when pediatric anesthesia resources are limited. Previous studies explored the use of ketamine in these procedures but required continuous infusions and high doses. The present study describes a simplified lower-dose bolus-only ketamine sedation protocol, evaluating its safety in 25 consecutive cases. There were no respiratory complications, sedation failures, or reversal agent administration, and all procedures were successfully completed. This protocol demonstrates that radiologist-directed ketamine sedation provides adequate sedation for pediatric patients undergoing procedures and provides preliminary evidence on its safety.

IRB or IACUC Approval Number: 23-935

Funding Sources: N/A

Abstract #147

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A Novel Neuro-Ophthalmic Manifestation of LMBRD1-Related Cobalamin Metabolism Disorder: Dorsal Midbrain Syndrome Reversed by Targeted B12 Supplementation

Purpose: To describe a case of dorsal midbrain syndrome and optic atrophy secondary to LMBRD1-related cobalamin metabolism disorder, with clinical improvement following targeted supplementation.

Case Report: An 18-year-old male presented with two months of progressive vision loss, nystagmus, and diplopia. Examination demonstrated visual acuity of 20/40 bilaterally, diminished color vision, optic disc pallor, convergence-retraction nystagmus, and bilateral exotropia. Brain and orbital MRI showed hyperintense FLAIR signal in the dorsal midbrain with bilateral optic atrophy. OCT demonstrated RNFL thinning, most pronounced temporally, and diffuse GCL-IPL thinning greatest in the maculopapular bundle. Humphrey visual field testing showed centrocecal scotomas. Serum and cerebrospinal fluid evaluation for autoimmune, inflammatory, and infectious were negative. Whole genome sequencing (WGS) identified a pathogenic heterozygous LMBRD1 variant, consistent with a disorder of cobalamin metabolism. The patient was started on methylcobalamin and adenosylcobalamin, resulting in improvement in visual acuity and nystagmus.

Conclusions: This case presents a unique manifestation of the LMBRD1-related cobalamin disorder, where the inability to convert cyanocobalamin into its active forms likely plays a role in dorsal midbrain syndrome and optic atrophy. The rapid clinical improvement after starting active B12 supplementation highlights the benefits of addressing the metabolic issue. This case also illustrates how WGS can effectively identify inherited metabolic causes of optic neuropathy and support early, targeted treatment for patients and their at-risk family members.

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Funding Sources: N/A

Abstract #148

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Burden and Outcomes of Pulmonary Hypertension in Patients Hospitalized With Heart Failure

Introduction: Pulmonary hypertension (PH) frequently coexists with heart failure (HF) and may contribute to worse clinical outcomes. However, contemporary national data evaluating outcomes among hospitalized HF patients with PH remain limited. We examined in-hospital outcomes among adults hospitalized with HF, comparing those with and without PH.

Methods: We analyzed the National Inpatient Sample (NIS) from 2018–2021 to identify adults admitted with a principal diagnosis of HF. Patients were stratified by the presence or absence of PH. Survey-weighted analyses provided nationally representative estimates. The primary outcome was all-cause in-hospital mortality. Secondary outcomes included acute respiratory failure, cardiogenic shock, acute respiratory distress syndrome, acute kidney injury (AKI), mechanical ventilation, extracorporeal membrane oxygenation, and intra-aortic balloon pump (IABP) use.

Results: Among 4,853,288 HF hospitalizations, 1,073,115 (22.1%) had concurrent PH. Patients with PH were older (72 vs. 70 years, $P<0.001$) and more frequently female (53.5% vs. 46.5%, $P<0.001$). Among patients with PH, 64.6% were White and 22.5% were Black. Compared with patients without PH, those with PH had higher prevalences of COPD (39.2% vs. 33.4%), obstructive sleep apnea (21.7% vs. 15.5%), atrial fibrillation (53.0% vs. 43.4%), and obesity (32.6% vs. 28.3%) (all $P<0.001$). PH was associated with higher odds of in-hospital mortality, acute respiratory failure, AKI, cardiogenic shock, mechanical ventilation, and IABP use.

Conclusion: Among HF hospitalizations, concurrent PH was associated with greater in-hospital mortality, complications, and mechanical support requirements, highlighting a high-risk population requiring targeted management strategies.

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Abstract #149

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Sex differences in Readmission and Outcomes after Transcatheter Aortic Valve Replacement

Background: Transcatheter aortic valve replacement (TAVR) is an established treatment for severe aortic stenosis. However, sex-related differences in post-procedural readmission and clinical outcomes remain incompletely understood. We examined the association between female sex, 30-day readmission, and in-hospital outcomes following TAVR.

Methods: Using the 2021–2022 Nationwide Readmissions Database (NRD), we identified adult TAVR hospitalizations using ICD-10-PCS codes. Outcomes included 30-day readmission, in-hospital mortality during the index and readmission hospitalizations, length of stay, and total hospital charges. Associations were evaluated using survey-weighted regression models.

Results: Among 172,976 TAVR hospitalizations, the mean age was 78.1±0.66 years, and 42.5% were female. Female sex was associated with higher odds of 30-day readmission (OR 1.16, 95% CI 1.10–1.22; P<0.001) and greater in-hospital mortality during the index admission (OR 1.36, 95% CI 1.17–1.57; P<0.001).

Conversely, among patients readmitted within 30 days, female sex was associated with lower in-hospital mortality (OR 0.63, 95% CI 0.49–0.82; P=0.001). Female sex was not associated with length of stay (IRR 1.02, 95% CI 0.97–1.07; P=0.43) but was associated with lower total hospital charges (IRR 0.89, 95% CI 0.84–0.94; P<0.001).

Conclusion: Women undergoing TAVR experienced higher 30-day readmission and index hospitalization mortality but lower mortality during readmission and lower hospital charges, highlighting important sex-related differences in post-TAVR outcomes.

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Funding Sources: N/A

Abstract #150

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Incidence of Incidental Gallbladder Adenocarcinoma Following Cholecystectomy for Presumed Benign Disease: A Contemporary Appalachian Cohort

Background: Incidental gallbladder carcinoma is an uncommon but clinically consequential finding after cholecystectomy for presumed benign disease. Contemporary data from Appalachian populations are limited.

Methods: We performed a retrospective cohort study of adults undergoing cholecystectomy for presumed benign disease at a tertiary academic referral center in West Virginia between October 2020 and December 2024. Patients undergoing cholecystectomy for known or suspected malignancy, concurrent procedures, or age younger than 18 years were excluded. The primary outcome was the incidence of incidental gallbladder malignancy identified on final pathology.

Results: Among 1,235 patients, the mean age was 47.5 ± 18.4 years and 66.3% were female. Laparoscopic cholecystectomy was the most common operative approach (76.5%), followed by robotic cholecystectomy (17.5%). One incidental gallbladder adenocarcinoma was identified, corresponding to an incidence of 0.08%. Calculous cholecystitis was the most common pathologic diagnosis (81.1%).

Discussion: The observed incidence of incidental gallbladder adenocarcinoma was lower than rates reported in several contemporary studies. Although routine histopathologic examination yielded few incidental malignancies in this cohort, identification of an occult cancer may substantially alter subsequent management. Larger multicenter studies incorporating intraoperative risk factors and cost-effectiveness analyses are needed to better define the role of routine versus selective histopathologic examination.

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Funding Sources: N/A

Abstract #151

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Chronic Exposure to Ouabain alters Muscle Stem Differentiation of human induced Pluripotent Stem Cells (hiPSC) and human Satellite Cells.

Muscle wasting inflicts patients with chronic kidney disease (CKD). Our published work in human induced pluripotent stem cells (iPSC)-derived skeletal muscle (iSkM) provided genetic evidence of the fundamental role of Na/K-ATPase (NKA) receptor signaling function in myogenesis. Circulating levels of endogenous cardiotonic steroid (eCTS), the specific ligands of NKA, are chronically elevated in CKD patients. While defective NKA has been linked to adverse cardiac remodeling and renal complications of CKD in experimental models, the impact of eCTS/NKA defects in CKD-related muscle wasting has not been examined.

This study investigated whether chronic exposure of induced muscle stem cells to the CTS ouabain alters iSkM differentiation. iPSCs purchased from iXCells (Cat#30HU-002) were differentiated through three stages: myogenic precursors (SkM01), myoblasts (SkM02) and myotubes (SkM03). Spontaneous contraction (video imaging), striations (immunohistochemistry), and muscle marker expression of MYOD1 (qPCR) were assessed. RT-qPCR analyses showed MYOD1 mRNA induced over 30,000 and 13,000-fold in SkM02 myoblasts and SkM03 myotubes respectively, relative to undifferentiated hiPSC (N=3). Addition of ouabain to the cell media for 72h at the SkM02 stage dose-dependently inhibited MYOD mRNA expression (3-fold at 2 nM (N.S), 6-fold at 10 nM (p<0.05) and 11-fold at 20 nM (p <0.001) (N=3).

Hence, chronic CTS exposure alters myogenesis in vitro. This human cell-based system provides a novel translational platform to test the effect of CKD patient plasma on muscle differentiation and further assess a mechanistic link between eCTS & muscle wasting and sarcopenia in CKD.

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Funding Sources: Supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence

Abstract #152

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Tricuspid Valve Infective Endocarditis in a Rural Appalachian Population During the Opioid Epidemic: A Single-Center Descriptive Case Series, 2015–2020

Background. Injection drug use–associated infective endocarditis has risen sharply during the opioid epidemic, and West Virginia has the nation's highest drug overdose burden. Detailed descriptions of tricuspid valve infective endocarditis (TVIE) from rural Appalachia during the peak epidemic years remain limited.

Purpose. To characterize the clinical, microbiologic, echocardiographic, and management features of patients with TVIE treated at a West Virginia referral center between 2015 and 2020.

Methods. In this retrospective descriptive case series, cases were identified using diagnostic coding with echocardiographic and pathologic confirmation. Variables were abstracted from the electronic medical record using a standardized data dictionary. Continuous variables are reported as median and interquartile range [IQR] and categorical variables as counts and percentages of non-missing observations.

Results. Among 54 patients, the median age was 33.5 years and 35 (65%) were female. Injection drug use was documented in 92% and hepatitis C antibody in 91%. *Staphylococcus aureus* predominated (89%). Vegetations were large (median length 25.5 mm) and mobile (95%), and 77% had moderate or severe tricuspid regurgitation; left ventricular function was preserved. Valve surgery was performed in 86%, although case ascertainment enriched the cohort for surgical patients. The median hospital length of stay was 25.5 days, and in-hospital and one-year mortality were each 4%.

Implications. TVIE at the epicenter of the opioid epidemic affected young, predominantly female patients with near-universal injection drug use and hepatitis C, presenting with anatomically aggressive disease but low short-term mortality. Integrated medical, surgical, and addiction-focused care, and study of longer-term outcomes including reinfection, are needed.

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Funding Sources: N/A

Abstract #153

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Evaluation of *Ceratodon purpureus*-Derived Sphingolipids in Combination with Antibiotics Against *Staphylococcus aureus* and *Serratia marcescens*

Antimicrobial resistance continues to pose a growing global health challenge, emphasizing the need for novel antimicrobial strategies and antibiotic adjuvants. Natural products have historically served as a valuable source of antimicrobial agents, and metabolites produced by the moss *Ceratodon purpureus* R40 have demonstrated both antineoplastic and antimicrobial properties. Previous studies identified the sphingolipids phytosphingosine and C16 sphinganine from *C. purpureus* as antimicrobial against Gram-positive *Staphylococcus aureus* (*S. aureus*) but little to no activity against Gram-negative *Serratia marcescens* (*S. marcescens*). While these metabolites demonstrate antimicrobial activity when used alone, combination therapy may further enhance their efficacy. Therefore, this study evaluated phytosphingosine and C16 sphinganine in combination with vancomycin against *S. aureus* and gentamicin against *S. marcescens* using checkerboard assays to assess potential synergistic interactions. This approach is particularly relevant for Gram-negative bacteria such as *S. marcescens*, whose outer membrane presents a significant barrier to antimicrobial penetration. Fractional inhibitory concentration index (FICI) analysis demonstrated indifferent interactions for all combinations, indicating that the metabolites did not enhance the activity of the tested antibiotics under the conditions examined. To further characterize the sphingolipids' antimicrobial mechanism, ongoing studies are evaluating the effects of these sphingolipids on bacterial membrane integrity and depolarization. This study provides insight into the antimicrobial potential and possible limitations of sphingolipid-based therapeutic strategies.

IRB or IACUC Approval Number: N/A

Funding Sources: A subaward from the Appalachian Natural Product Research Program (ANPRP) USDA Grant No. 58-6060-2-006 to L.M.B and E.V.S

Abstract #154

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MULTIVESSEL SPONTANEOUS CORONARY ARTERY DISSECTION WITHIN 24 HOURS: A CASE REPORT

Spontaneous coronary artery dissection (SCAD) is a potentially life-threatening, nonatherosclerotic cause of acute coronary syndrome (ACS) that predominantly affects young to middle-aged women. SCAD results from separation of the coronary arterial wall, which can compress the true lumen and cause myocardial ischemia.

We report a 61-year-old woman who presented with ST-segment elevation myocardial infarction and was found to have distal left anterior descending (LAD) artery SCAD type 2 (Image 1), which was managed conservatively. Approximately 10 hours later, she developed recurrent angina with rising troponin levels. Repeat coronary angiography demonstrated a new proximal right coronary artery (RCA) SCAD type 4 (Image 2. Image 3 with previous RCA angiogram), requiring percutaneous coronary intervention with drug-eluting stent implantation. Medical therapy was optimized, and she was discharged home. Approximately four months later, she presented again with angina; repeat angiography demonstrated a patent RCA stent and no angiographic evidence of recurrent SCAD.

SCAD is an important nonatherosclerotic cause of myocardial ischemia with heterogeneous clinical presentations. This case demonstrates sequential involvement of the LAD and RCA within 24 hours, with conservative management of the initial distal LAD lesion followed by PCI for a new proximal RCA lesion in the setting of recurrent ischemia. To our knowledge, this may represent the first reported case of bilateral SCAD within 24 hours. Prompt reassessment of recurrent symptoms and individualized management are essential to optimize outcomes.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #155

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Hyperglycemia-associated dysregulation of PPAR γ - and Wnt/ β -catenin signaling in the intestinal cells may underlie butyrate failure in limiting extraintestinal Salmonella dissemination.

Type 2 diabetes (T2D) is a chronic disease and is the eighth leading cause of death in the US. Diabetics are prone to more frequent and more severe infections including illnesses caused by food-borne pathogens. For instance, T2D patients are at greater risk for developing invasive life-threatening infections with non-typhoidal Salmonella. In our study 8-week-old male TALLYHO (TH) mice were kept on high fat diet (HFD) to promote T2D or on the control chow diet, until they reached 16 weeks of age. Next, HFD and chow-fed mice were orally infected with 10⁶ colony forming units of a fully virulent bioluminescent Salmonella Typhimurium (STM) strain and the pathogen's spread was followed by in vivo imaging. We detected drastic acceleration of extraintestinal STM spread along with increase in the clinical scores in diabetic mice compared to controls. Infected animals were treated with tributyrin (butyrate prodrug) to activate PPAR γ (peroxisome proliferator activation receptor gamma) and to limit STM escape from the gut. Unexpectedly, while butyrate reinforced gut barrier function regardless of the diabetic status and reduced colonic inflammation in the HFD animals, it failed to limit STM extraintestinal spread in diabetic mice. We hypothesize that persistent hyperglycemia resulted in a disbalance between PPAR γ - and Wnt/ β -catenin signaling in the intestinal cells leading to butyrate failure to limit the extraintestinal STM spread in the diabetic host. To test this hypothesis, we stained cecal sections with antibodies to iNOS and MCT-1, PPAR γ - and Wnt/ β -catenin target, respectively. The scoring of the slides is underway.

IRB or IACUC Approval Number: 753

Funding Sources: NIH P20GM103434 & NIH U54GM104942

Abstract #156

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Post-Viral HLA-A29-Negative Multifocal Choroiditis Mimicking Birdshot Chorioretinopathy in an Autoimmune-Predisposed Host

Introduction: Birdshot chorioretinopathy (BSCR) is a chronic, bilateral posterior uveitis characterized by near-universal HLA-A29 positivity (>95%). Post-viral dysimmune cascades can generate inflammatory phenocopies of posterior white dot syndromes, presenting significant diagnostic challenges. We report an HLA-A29-negative patient presenting with multifocal choroiditis (MFC) mimicking BSCR following sequential viral insults in the setting of underlying autoimmunity.

Methods: A 52-year-old female with Graves' disease and prior V1 herpes zoster virus (HZV) ophthalmicus presented with bilateral photopsia and floaters following SARS-CoV-2 (COVID-19) infection. Comprehensive ophthalmologic workup included best-corrected visual acuity (BCVA), fundus autofluorescence (FAF), fluorescein angiography (FA), indocyanine green angiography (ICG), brain MRI, systemic inflammatory serologies, and HLA-A29 genotyping.

Results: Baseline BCVA was 20/20 OU. Fundoscopy revealed bilateral hypopigmented choroidal lesions with trace vitreous cells and vitreomacular adhesion. FA demonstrated late optic disc leakage, and ICG showed multifocal choroidal lesions suggestive of BSCR. However, immunogenetic testing confirmed HLA-A29 negativity. Serology demonstrated elevated C-reactive protein (20.1 mg/L; reference ≤ 10.0 mg/L) and positive ANA. Combined oral valacyclovir and topical prednisolone acetate 1% yielded complete clinical resolution within 1 month. Four months post-treatment cessation, the patient developed recurrent bilateral photopsia; brain MRI demonstrated non-specific punctate frontal subcortical white matter hyperintensities without active demyelination. Symptoms responded rapidly to re-initiation of dual antiviral/anti-inflammatory therapy.

Conclusion: Sequential viral triggers (COVID-19 and HZV) can incite choroidal stromal inflammation mimicking BSCR in autoimmune-predisposed patients. Identifying HLA-A29 negativity is critical to avert unnecessary lifelong systemic immunosuppression and guide tailored antiviral and anti-inflammatory regimens.

IRB or IACUC Approval Number: IRB approval was not required for this single-patient case report.

Funding Sources: N/A

Abstract #157

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Characterization of UshA as a virulence factor promoting macrophage death during *Serratia marcescens* infection

Serratia marcescens is a Gram-negative opportunistic nosocomial pathogen with growing clinical importance. Neutrophils are critical in control of infections caused by *S. marcescens*. Upon activation, neutrophils excrete neutrophil extracellular traps (NETs) that are made of extracellular DNA, histones, and antimicrobial proteins which add to their defensive repertoire. *S. marcescens* encodes a periplasmic enzyme UshA, which has been shown in other bacterial species to facilitate macrophage death through the conversion of degraded NETs into deoxynucleosides. Extracellular deoxypurines can lead to macrophage intoxication through their conversion into deoxynucleoside triphosphates (dATP or dGTP). When dATP or dGTP accumulate to a toxic level, they cause DNA damage and mitochondrial dysfunction leading to cellular death. To investigate this mechanism in the context of *S. marcescens* infection, we generated a plasmid vector (pBAD30) containing *ushA* under the control of an L-arabinose inducible promoter and varied the expression of UshA to determine if an increase in the enzyme production contributed to excessive accumulation of deoxynucleosides in the presence of substrate (5-deoxyadenosine monophosphate (dAMP) or 5-deoxyguanosine monophosphate (dGMP)). We then determined whether an increase in *ushA* expression resulted in an increase in macrophage and monocyte death during *S. marcescens* and heterologous *Escherichia coli* infection in the presence of dAMP or dGMP. These results support our hypothesis that UshA is a virulence factor of *S. marcescens* and has a direct role in immune evasion by inducing macrophage death.

IRB or IACUC Approval Number: N/A

Funding Sources: NASA West Virginia Space Grant Consortium, Grant # 80NSSC25M7079 NIH R03AI175783

Abstract #158

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Preoperative Pain Tolerance and a Composite Psychosocial Risk Score Predict Postoperative Opioid Consumption After Primary Total Knee Arthroplasty

Introduction: Inadequate postoperative pain management after total knee arthroplasty (TKA) remains common and contributes to opioid overuse and dependence risk. This ongoing prospective study evaluates whether preoperative self-reported pain tolerance—alone and as part of a composite psychosocial risk profile—predicts inpatient opioid consumption, expressed as morphine milligram equivalents (MME), after primary unilateral TKA. The findings presented represent a preliminary analysis of patients enrolled to date.

Methods: Adult patients undergoing primary, unilateral TKA at a single institution were prospectively enrolled preoperatively. Each patient completed a preoperative survey assessing self-reported pain tolerance and an acceptable/tolerable pain level (0–10 scale). A composite psychosocial pain-risk score (range 0–5) was constructed for the current analysis from five binary factors: low self-reported pain tolerance, a documented chronic pain syndrome, a mental health diagnosis, a sleep disturbance diagnosis, and preoperative opioid use. Inpatient opioid administration was converted to total MME. Associations with MME were assessed via Wilcoxon rank-sum testing and linear regression on log-transformed MME, unadjusted and adjusted for age, sex, body mass index (BMI), and operative duration.

Results: Preliminary data from 237 patients were analyzed (mean age 67.0 ± 8.8 years; 127 female, 110 male; mean BMI 33.3 ± 6.1 kg/m²). Mean inpatient MME was 63.6 ± 43.3 (median 55.0, range 0–420). Patients self-reporting high pain tolerance ($n = 166$, 70%) had significantly lower inpatient MME than those who did not ($n = 71$, 30%) (median 50.0 vs. 60.0 MME; Wilcoxon rank-sum $p = 0.0496$), an association that persisted after adjustment for age, BMI, sex, comorbidities, and operative duration (adjusted -19.1% MME; 95% CI -33.1% to -2.2% ; $p = 0.029$). The composite psychosocial risk score demonstrated a significant dose-response relationship with MME, both unadjusted ($+11.9\%$ MME per point; $p = 0.002$) and adjusted for age, BMI, sex, operative duration, diabetes, and hypertension ($+11.7\%$ MME per point; 95% CI $+3.8\%$ to $+18.4\%$; $p = 0.003$). A nested model comparison confirmed the composite score retained the explanatory value of its five individual components ($p = 0.56$). Increasing age was independently associated with lower MME (-1.2% per year; $p = 0.033$), consistent with prior literature.

Conclusion: Preliminary findings from this ongoing prospective study suggest that preoperative self-reported pain tolerance, particularly when incorporated into a brief composite psychosocial risk score, is associated with inpatient opioid consumption after primary TKA. A simple five-item preoperative screening tool may ultimately help identify patients at higher risk for elevated postoperative opioid requirements and support more individualized perioperative analgesic planning. However, data collection is ongoing, and these findings should be considered preliminary. The modest effect size of the univariate pain-tolerance association ($p = 0.0496$) and the ongoing enrollment warrants continued data collection and external validation in larger, independent cohorts before this approach is used to guide clinical decision-making.

IRB or IACUC Approval Number: 2325691-2

Funding Sources: N/A

Abstract #159

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Delayed Onset Monoarticular Knee Pain Following Local Bee Sting: A Case Report

Background: Hymenoptera stings commonly cause localized pain, erythema, and edema. Although delayed immune-mediated reactions have been described, delayed isolated monoarticular symptoms without significant objective inflammatory findings appear to be uncommon. We present a case of delayed ipsilateral knee pain following a bee sting that responded to oral corticosteroids.

Case Presentation: A previously active 55-year-old female presented with one week of progressive left knee pain and stiffness after a bee sting to the ipsilateral popliteal fossa. The sting was followed by transient local knee swelling and facial swelling that resolved with diphenhydramine. After a three-day symptom-free interval, she developed recurrent knee pain causing impaired ambulation, difficulty with stairs, and poor sleep quality due to pain. Examination showed a small erythematous papule at the sting site but no warmth, erythema, deformity, or effusion of the knee. Radiographs showed no acute abnormality. Symptoms improved substantially after a five-day course of 20 mg prednisone twice daily and fully resolved over three weeks.

Conclusion: Although causality cannot be established, the temporal relationship of the sting and arthralgia, the lack of alternative pathology or trauma history, and response to corticosteroids suggest a possible delayed inflammatory reaction. Clinicians should consider delayed immune-mediated complications in patients presenting with unexplained progressive monoarticular pain after a nearby insect sting, even when objective inflammatory findings are minimal.

IRB or IACUC Approval Number: None

Funding Sources: None

Abstract #160

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Arthroscopic Suture-Bridge Fixation of a Posterior Glenoid Osteochondral Defect in an Adolescent Softball Player: A Case Report

Introduction: Osteochondral defect of the glenoid is a rare condition with no established treatment algorithm. Traditional treatment involves bone marrow stimulation to the fracture bed followed by fixation using metal or bioabsorbable screws. This case report highlighted a novel arthroscopic suture bridge technique designed to preserve the native defect while avoiding implant related complications

Case Presentation:

We present the case of a 15-year-old female who presents with 9 months of pain worse with overhead activities. MRI revealed atraumatic posterior glenoid OCD. The patient is an active softball athlete with no prior history of shoulder injury.

Surgical Technique: Diagnostic arthroscopy demonstrated a partially attached osteochondral fragment of the posterior glenoid. The lesion bed was prepared with microfracture to promote healing, and the viable fragment was reduced and stabilized using an arthroscopic suture bridge construct.

Results: At 5 months follow-up, the patient was successfully progressing in a throwing program with complete reduction of symptoms.

Conclusion: Arthroscopic fixation of posterior glenoid osteochondritis dissecans using a novel suture bridge technique may provide a viable method of preserving native cartilage anatomy while avoiding the need for hardware implantation.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract 161

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Predictors of Split-Thickness Skin Graft Failure in Burn Patients: A Retrospective Cohort Study

Burn injuries frequently require surgical management with split-thickness skin grafting (STSG) to achieve wound closure and prevent complications. While STSG is a standard and effective treatment, graft failure remains a significant clinical problem, leading to prolonged hospitalization, increased risk of infection, additional operations, and worse functional outcomes.

Multiple patient-related and perioperative factors—such as burn size, timing of grafting, infection, and comorbidities—may influence graft success. However, these predictors are not well defined, particularly in rural and community hospital settings.

The purpose of this study is to identify clinical and operative factors associated with STSG failure in burn patients. Understanding these predictors may help guide surgical timing, optimize patient selection, and improve outcomes.

Methods:

1. We will conduct a retrospective review of burn patients treated at Cabell Huntington Hospital over a defined study period (2015–2025).
2. Patients who underwent split-thickness skin grafting for burn injuries will be identified using the institutional trauma registry and electronic medical record.
3. Data will be collected from the medical record, including demographics, burn characteristics, clinical factors, operative details, and hospital course.
4. The primary outcome will be graft failure, defined as less than 90% graft take within the early postoperative period or requirement for repeat grafting.
5. Secondary outcomes will include postoperative infection, length of hospital stay, and need for reoperation.
6. To minimize breach of confidentiality, data will be de-identified and issued a study ID before being stored on a secured password protected database.
7. Statistical analysis will be performed to identify predictors of graft failure.

IRB or IACUC Approval Number: 2443140

Funding Sources: N/A

Abstract #162

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Patient-Reported Outcomes of Nipple Sensation and Morphology After Reduction Mammoplasty

Breast reduction surgery is a common procedure that helps relieve physical discomfort such as back pain and improves quality of life. However, one concern patients often have is whether they will be satisfied with the operation's effect on the nipple sensitivity. The nipple contains important nerves that contribute to normal sensation. During surgery, these nerves may be stretched, partially disrupted, or preserved depending on the surgical technique used. While some patients recover normal sensation over time, others may experience decreased, increased or lost sensation.

Currently, there is limited information available on how often nipple sensation changes after surgery, how long it takes to recover, and how these changes affect patient satisfaction. This study aims to better understand these outcomes by asking patients about their experience after surgery. The results of this study may help surgeons better counsel patients before surgery and improve surgical techniques to preserve sensation.

We will identify patients who have undergone breast reduction surgery using the electronic medical record system. Basic clinical information including age, body mass index (BMI), smoking status, diabetes, and details of the operations that the patients underwent will be collected by contacting patients by phone and questions will be asked by the surveyor using a survey monkey questionnaire (approximately 5 minutes) about sensation changes, recovery time, and satisfaction. Patients may skip questions or stop at any time and responses will be recorded without identifying information and stored on a survey monkey platform.

IRB or IACUC Approval Number: 2440926

Funding Sources: N/A

Abstract #163

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Functional Enrichment Signatures of Opioid Withdrawal in the Nucleus Accumbens and Ventral Tegmental Area

Background: Opioid withdrawal drives relapse and continued drug seeking, yet its molecular mechanisms underlying sex-specific behavioral responses remain elusive. The nucleus accumbens (NAc) and the ventral tegmental area (VTA) anchor the mesolimbic reward circuit, where sex-specific withdrawal responses likely involve distinct pathways. Here, we reanalyzed rat RNA-seq dataset GSE173959 to characterize sex- and region-dependent responses and evaluated robustness.

Methods: Using our in-house pipeline, we assessed read quality, trimmed, aligned them to *Rattus norvegicus* GRCr8 reference genome using STAR, and generated gene-level read counts with featureCounts using Ensembl release annotation 116. We modeled differential gene expressions with DESeq2 using sex, treatment, and sex-by-treatment interaction terms. We focused on female fentanyl withdrawal vs female saline contrasts in the NAc and VTA. To assess gene-ranking robustness, we compared the DESeq2 Wald statistic, ASHR-shrunken log₂ fold change (LFC), and sign (LFC) × -log₁₀(*p*).

Results: Our reanalysis identified transcriptional patterns consistent with the original study. Ranking metrics were highly correlated transcriptome-wide (Spearman $\rho = 0.995\text{--}0.997$) but their respective top 50 genes differed by region. Wald and ASHR shared only 24% of the top 50 upregulated genes in the female NAc compared with 96% in the female VTA. Across all ranking methods, the 19 upregulated genes (e.g., *Tph2*, *Alox15*, and *Slc4a1*) were consistently among the top 50 upregulated genes in the VTA.

Conclusion: Our pipeline demonstrates that global concordance metrics can conceal differences needed for gene prioritization. Functional enrichment analyses will determine whether different ranking approaches converge on biological pathways across sex and mesolimbic brain regions.

IRB or IACUC Approval Number: N/A

Funding Sources: Marshall University Joan C. Edwards School of Medicine and Nato Startup

Abstract #164

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NDRG1 Expression Differentiates Clear Cell Renal Cell Carcinoma from Renal Cysts and Papillary Renal Cell Carcinoma

Clear cell renal cell carcinoma (ccRCC) is the most common subtype of kidney cancer, and metastatic disease remains largely incurable despite recent therapeutic advances. Although we previously demonstrated that total NDRG1 and phosphorylated NDRG1 are elevated in ccRCC relative to matched normal kidney tissue, the specificity of these biomarkers for ccRCC compared with other renal lesions remains unknown. Therefore, total NDRG1 and phosphorylated NDRG1 (Ser330 and Thr346) were quantified by Western blot and ELISA in human ccRCC, papillary RCC, benign renal cyst, and normal kidney specimens obtained from a tissue biobank.

Western blot analysis demonstrated that total NDRG1 expression was significantly increased approximately 4-fold in ccRCC compared with papillary RCC ($P = 0.0002$, $N = 4$). Similarly, phospho-NDRG1 Thr346 increased 5-fold ($P = 0.008$), whereas phospho-NDRG1 Ser330 exhibited a markedly greater 15-fold increase in ccRCC relative to papillary RCC ($P < 0.0001$). Comparison of ccRCC tumors with benign renal cysts revealed significant increases in total NDRG1 (1.7-fold, $P = 0.0442$), phospho-NDRG1 Thr346 (12-fold, $P = 0.0063$), and phospho-NDRG1 Ser330 (13-fold, $P = 0.0004$). ELISA analysis ($N = 5$) confirmed significantly higher levels of total NDRG1 (2.6-fold, $P < 0.0001$), phospho-NDRG1 Ser330 (7-fold, $P = 0.0001$), and phospho-NDRG1 Thr346 (11-fold, $P = 0.0002$) in ccRCC compared with renal cyst specimens. Statistical significance was determined by one-way ANOVA with Tukey's test.

These findings identify NDRG1 and phospho-NDRG1 as tissue biomarkers of ccRCC and demonstrate that phospho-NDRG1 Ser330 provides the greatest discrimination from papillary RCC and benign renal cysts, supporting its potential utility for renal tumor classification.

IRB or IACUC Approval Number: 112274-39

Funding Sources: Edwards Foundation

Abstract #165

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Delayed-Onset MAPKAPK3 Retinal Phenotype

Background: Martinique Crinkled Retinal Pigment Epitheliopathy (MCRPE), or patterned macular dystrophy type 3, is an autosomal dominant disorder caused by pathogenic MAPKAPK3 variants, typically presenting in early-to-mid adulthood with a characteristic "crinkled" macular appearance. We evaluate an atypical, delayed-onset phenotype to expand the known clinical and electrophysiologic spectrum of this mutation.

Methods: A 79-year-old male with progressive central vision loss underwent comprehensive neuro-ophthalmologic evaluation, including multifocal electroretinography (mfERG), full-field clinical electroretinography (ffERG), optical coherence tomography (OCT), fundus autofluorescence (FAF), and whole-exome genetic sequencing.

Results: FAF and fundoscopy were unremarkable, lacking classic crinkled macular changes. However, longitudinal OCT demonstrated subtle, progressive thickening of the RPE-Bruch's membrane interface. ffERG revealed global cone-predominant dysfunction with borderline-reduced photopic a-waves and delayed b-wave latencies, while genetic testing identified a heterozygous c.343_345del (p.L115del) deletion in the MAPKAPK3 coding region.

Conclusion: This case demonstrates that MAPKAPK3-related disease can manifest as a subtle, late-onset retinal disorder with incomplete age-dependent penetrance. In patients with ambiguous or age-atypical macular changes, integrating electrodiagnostic and genetic testing is essential to prevent misclassification as age-related macular degeneration.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #166

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Utility of the Sino-Nasal Outcome Test (SNOT-22) in chronic rhinosinusitis patients with comorbid depression

Introduction: Chronic rhinosinusitis (CRS) is an inflammatory sinonasal condition that negatively impacts patients' quality of life (QoL). The aim of this study is to understand how comorbid depressive disorders confound the SNOT-22 subdomain scores, specifically the psychological and sleep subdomains.

Methods: A retrospective cross-sectional study was conducted with adult patients presenting to an otolaryngology clinic between August 2020 and July 2025. A series of multivariate linear regressions was conducted to investigate the relationship between depression diagnosis (yes vs no) and SNOT-22 total, as well as subdomain scores in CRS patients and control patients separately.

Results: The sample consisted of 390 CRS patients and 134 control patients. In linear regressions controlling for covariates, CRS patients with comorbid depression had significantly higher SNOT-22 psychological and sleep subdomain scores as compared to CRS patients without depression. In contrast, control patients with and without depression did not significantly differ from one another on any SNOT-22 subscales. SNOT-22 total scores did not significantly differ by depression diagnosis in the CRS sample nor in the control sample.

Conclusion: These findings suggest that the SNOT-22, including the psychological and sleep subdomains, is a valid measure of CRS-specific disease burden in patients with depressive disorder and that patients with comorbid CRS and depression may experience greater subjective CRS-related disease burden.

IRB or IACUC Approval Number: 2004956868

Funding Sources: N/A

Abstract #167

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The Effect of Age on Complications After Transoral Robotic Surgery

Background: Transoral robotic surgery (TORS) for the treatment of oropharyngeal cancer (OPC) was initially described in 2005. Since then, few studies have examined the impact of age on outcomes following TORS for OPC.

Objective: Our goal was to examine the effect of elderly status (age >70) on outcomes after TORS using a publicly available national database.

Methods: The TriNetX database was queried for all patients ages 18-90 undergoing TORS with a diagnosis of OPC. Primary outcomes were rates of tracheostomy, gastrostomy, and overall medical and surgical complications within 90 days after TORS. Propensity score matching adjusted for preoperative comorbidities to evaluate the impact of elderly status on outcomes.

Results: 1512 patients from 45 healthcare organizations were identified as having undergone TORS for the treatment of OPC. One-to-one propensity score matching yielded 616 matched pairs comparing the age 18–69 cohort with the age >70 cohort. Age >70 was not associated with increased odds of postoperative tracheostomy (OR=1.061, 95% CI=0.494-2.276) or gastrostomy (OR=0.94, 95% CI=0.628-1.405). Age >70 was associated with a significantly increased risk of death (RD=1.78%, 95% CI=0.741-2.836, p=0.0009). Age >70 was not associated with increased odds of experiencing any complication overall (OR=1.158, 95% CI=0.715-1.875) or other individual complication rates.

Conclusion: Elderly status was not associated with greater odds of postoperative tracheostomy or gastrostomy after TORS in the treatment of OPC. Elderly status had a higher risk of death after TORS, however, there was no increased odds of other complications.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #168

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Metronidazole induced neurotoxicity: A Case Report

BACKGROUND: Neurotoxicity can arise as an unintended side effect of commonly used medications. Metronidazole-induced neurological side-effects are rare, with a reported incidence of 0.2%. Here we report a case of reversible metronidazole-induced neurotoxicity.

DESIGN/METHODS: Case Report

RESULTS: A 77-year-old female presented to the hospital with dysarthria, diplopia, and vertigo of a week's duration. The patient had undergone intracranial abscess resection in the right frontal lobe region five weeks prior to symptom onset. She was subsequently started on oral metronidazole, which she was taking at the time of her presentation to the hospital. Neurological examination revealed ataxia, binocular diplopia and generalized weakness. MRI brain with and without contrast revealed T2 hyperintense lesions of the dentate nuclei bilaterally. Thiamine levels were obtained and were normal. Anti-acetylcholine receptor antibody workup was negative. Metronidazole was discontinued with improvement in the patient's symptoms. Repeat MRI conducted eight weeks later showed resolution of the earlier noted imaging findings.

CONCLUSION: Classic imaging and clinical findings of metronidazole neurotoxicity were noted in this case, which resolved upon cessation of metronidazole. Even though rare, neurological side-effects of metronidazole may lead to worsened patient outcomes, and hence merit urgent recognition for optimal management.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #169

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Seizures in SMART Syndrome: A Case Report

BACKGROUND: Stroke-like migraine attacks after radiation therapy (SMART) syndrome is a rare manifestation of radiation therapy complications. Seizures can be seen in up to 35 % of cases of SMART syndrome.

RESULTS: 79-year old male presented to the hospital as a code stroke when he developed acute onset paralysis of the right upper extremity. The patient had a history of lung cancer with metastasis to the brain which was treated with surgical resection as well as radiation therapy. CT imaging showed vasogenic edema in the left frontoparietal region. The patient subsequently developed jerking movements of the right upper extremity that lasted for a minute. There was no prior history of epilepsy. The patient was subsequently started on levetiracetam. MRI imaging of the brain was conducted with and without contrast and revealed extensive vasogenic edema in left frontal and parietal lobes with irregular enhancement suggestive of radiation necrosis. EEG monitoring revealed an episode of rhythmic theta activity at C3 suggestive of an electrographic seizure. Oxcarbazepine was added to the medication regimen. The patient was also started on steroids to mitigate the manifestations of radiation necrosis. No further seizures were noted during the hospitalization. The patient was discharged on antiseizure medications.

CONCLUSION: Radiation necrosis can manifest with neurological dysfunction in the form of SMART syndrome. Mean time to symptom onset is about 14 years, but rarely the symptoms can present even within a year of radiation therapy. Given the heterogeneity of clinical presentations, prompt recognition of symptoms is vital for optimal outcomes.

IRB or IACUC Approval Number: N/A

Funding Sources: N/A

Abstract #170

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Ovarian Fibroma with Minor Sex Cord Elements in an 81-Year-Old Woman: A Rare Entity, Diagnostic Pitfall, and Comprehensive Molecular Characterization

Ovarian fibroma with minor sex cord elements (MSCE) is a rare sex cord-stromal tumor, with fewer than 20 cases reported in the literature since its initial description by Young and Scully in 1983. The tumor is defined by a predominantly fibromatous or thecomatous component with scattered sex cord-like cells occupying less than 10% of the tumor area. Most reported cases occur in women aged 40–65 years. We present a case in an 81-year-old woman, representing one of the oldest reported patients with this entity. Case An 81-year-old woman, gravida 4 para 4, with a remote history of total hysterectomy with ovarian preservation (1969) presented with abdominal discomfort and a pelvic mass, initially misinterpreted on computed tomography (CT) as uterine in origin due to incomplete surgical history. Pelvic ultrasonography identified a 10.6 cm complex cystic mass adjacent to the vaginal cuff. Robotic-assisted bilateral salpingo-oophorectomy revealed a 9 cm right ovarian mass. Histopathology demonstrated a neoplastic spindle cell proliferation in a fibrocollagenous stroma with scattered tubules, trabeculae, and clusters of luteinized cells comprising less than 10% of the tumor. Immunohistochemistry and next-generation sequencing confirmed the diagnosis of ovarian fibroma with MSCE, with microsatellite-stable status and no reportable genetic alterations. Pelvic washings were negative for malignancy. The patient had no clinical or biochemical evidence of hormonal hypersecretion despite the presence of luteinized cells. Postoperative recovery was uneventful from a gynecologic standpoint. Conclusion This case highlights the rarity of ovarian fibroma with MSCE in advanced age, the diagnostic challenge posed by remote pelvic surgery when surgical history is incomplete, and the value of comprehensive molecular characterization in rare ovarian tumors. The absence of hormonal manifestations despite luteinized cells underscores the variable clinical behavior of this entity.

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Abstract #171

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Dermatofibrosarcoma Protuberans of the Hallux Mimicking a Ganglion Cyst Following Remote Penetrating Trauma: A Case Report

Introduction: Dermatofibrosarcoma protuberans (DFSP) is a rare, locally aggressive cutaneous soft-tissue sarcoma with low metastatic potential. Involvement of the toes is particularly uncommon and may pose a diagnostic challenge because of its indolent growth and resemblance to benign soft-tissue lesions.

Case Presentation: A 35-year-old woman presented with a longstanding, progressively enlarging mass of the dorsal left hallux. She reported a remote penetrating injury involving an earring at the affected site, followed by development of a small nodule that gradually enlarged over many years. After recently striking the toe against a concrete step, she developed increased pain, bruising, and discoloration, prompting emergency evaluation. The lesion was subsequently described as a freely mobile, transilluminating mass and was clinically diagnosed as a ganglion cyst. Surgical excision demonstrated a superficial, mobile soft-tissue mass without gross attachment to underlying deep structures. Histopathologic examination unexpectedly revealed an atypical spindle-cell neoplasm. Immunohistochemistry demonstrated CD34 positivity with negative S100 and desmin staining, prompting expert pathologic consultation. Outside review confirmed dermatofibrosarcoma protuberans without high-grade fibrosarcomatous transformation.

Conclusion: DFSP should remain in the differential diagnosis of persistent, slowly enlarging acral masses despite clinically benign features. This case highlights an unusual hallux presentation, prolonged evolution following remote penetrating trauma, and the potential for DFSP to convincingly mimic a ganglion cyst, emphasizing the importance of histopathologic examination of excised soft-tissue lesions.

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Abstract #172

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Distinct Symptom Domain Responses to Transcranial Magnetic Stimulation in Multifactorial Treatment-Resistant Depression: A Case Report

Background: Treatment-resistant depression (TRD) is a heterogeneous disorder with variable response to transcranial magnetic stimulation (TMS). Chronic pain and adverse childhood experiences may contribute to distinct depressive symptom domains that differentially influence treatment outcomes.

Case Presentation: A 33-year-old man with longstanding TRD, generalized anxiety disorder, chronic diffuse pain, and a history of childhood adversity underwent 35 sessions of high-frequency repetitive TMS over eight weeks while participating in concurrent weekly psychotherapy. Despite multiple antidepressant trials and cognitive behavioral therapy, he continued to experience severe depressive symptoms with significant functional impairment. Clinical response was assessed using serial psychiatric evaluations and PHQ-9 scores.

Results: Serial psychiatric evaluations demonstrated improvement in trauma-related cognitive-affective symptoms, including reduced maladaptive guilt, improved emotional insight, decreased negative self-schema, and greater ability to identify and challenge longstanding negative core beliefs. Overall depressive symptoms demonstrated modest improvement, with PHQ-9 decreasing from 17 to 14. In contrast, depressive symptoms associated with persistent chronic pain, functional disability, and occupational loss demonstrated minimal clinical improvement despite continued psychotherapy. These qualitative differences in symptom response remained clinically apparent during approximately six years of longitudinal psychiatric follow-up.

Conclusions: This case highlights the clinical heterogeneity of TRD and suggests that trauma-related cognitive-affective symptoms and chronic pain-associated depressive symptoms may demonstrate differential responses to combined TMS and psychotherapy. Although causality cannot be established in a single case and concurrent psychotherapy precludes attribution of benefit to TMS alone, the observed pattern supports the hypothesis that symptom-domain heterogeneity may influence neuromodulation outcomes. Prospective studies incorporating symptom-domain-specific outcome measures are needed to better characterize differential responses to TMS and inform individualized treatment strategies.

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Female Sex Is Associated With Increased Intraoperative Hypotension Burden During Primary Total Knee Arthroplasty

Intraoperative hypotension (IOH) has been associated with postoperative morbidity in non-cardiac surgery, but its effect in total knee arthroplasty (TKA) remains underexplored. This study evaluated sex-based differences in IOH and their association with early recovery outcomes following primary TKA.

A retrospective cohort of 892 consecutive patients undergoing primary TKA between September 2020 and April 2025 was analyzed. Baseline mean arterial pressure (MAP), the first recorded MAP before anesthetic induction or neuraxial block placement. Intraoperative MAP was monitored at one-minute intervals throughout the procedure. The primary outcome was the occurrence of IOH, any duration of MAP <65 mmHg. Prolonged IOH, a cumulative duration >15 minutes, was analyzed as a secondary outcome. Multivariable logistic regression was used to evaluate predictors of IOH. Female patients experienced a greater burden of IOH, with lower intraoperative geometric mean MAP (73.7 ± 7.9 vs 75.3 ± 7.7 mmHg, $p < 0.001$) and more minutes with MAP <65 mmHg (10.9 ± 21.2 vs 7.1 ± 17.6 , $p < 0.001$). In adjusted analyses, male sex was associated with lower odds of any IOH (odds ratio [OR] 0.59, 95% confidence interval [CI] 0.42–0.83; $p = 0.003$) and prolonged IOH (OR 0.63, 95% CI 0.46–0.93; $p = 0.02$). These findings were consistent in the regional anesthesia subgroup for any IOH (OR 0.62, 95% CI 0.44–0.86; $p = 0.005$). Female sex was associated with an increased burden of intraoperative hypotension during TKA. However, these differences were not associated with delayed discharge or early readmission, suggesting uncertain clinical significance.

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Abstract #174

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Decreased Time to Stability and Increased Anterior Pelvic Tilt during On-Board IMU-Based Return to Sport Biomechanical Analysis: Evidence for a Novel Hip-Dominant Strategy PostACL in Internal Brace and Biologically Enhanced ACL versus Standard Reconstruction?

Objectives: Anterior cruciate ligament (ACL) injury and reconstruction may alter movement strategies and increase reinjury risk. A “fertilized ACL” (fACL) technique uses an all-soft tissue quadriceps graft, all-inside fixation, internal brace, demineralized bone matrix, and bone marrow concentrate. This study compared pelvic tilt after fACL and standard ACL reconstruction with matched controls and evaluated whether changes suggest a hip-dominant compensatory strategy.

Methods: The study included 1,298 subjects. Ninety-four fACL patients (54 males, 40 females; mean age 18.6 ± 2.2 years) were assessed 6–12 months postoperatively and compared with 10:1 matched standard ACL reconstruction and healthy controls matched by sex, age, height, and mass. IMU-based motion capture measured pelvic mechanics during single-leg squat and single-leg hop tasks. One-way ANOVAs with adjusted post-hoc pairwise comparisons evaluated group differences.

Results: The fACL group demonstrated greater posterior pelvic tilt than both standard ACL and control groups during single-leg squat, reflected by more negative pelvic flexion deviations ($p < 0.001$). During single-leg hop, the fACL group showed greater posterior pelvic tilt bilaterally ($p < 0.001$) and faster time to stability than both comparison groups ($p < 0.001$).

Conclusions: Patients 6–12 months after fACL reconstruction demonstrate increased posterior pelvic tilt during controlled and dynamic tasks. This may represent an adaptive hip-dominant strategy to maintain stability during loading. Rehabilitation may benefit from emphasizing lumbopelvic control and trunk mechanics. Further study is needed to determine whether these patterns affect reinjury risk.

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Abstract #175

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A Batch Analysis Method for Quantifying Astrocyte-Synaptic Coupling in STED Super-Resolution Tripartite Synapse Images

Synaptic structural dynamics are an important indicator of synaptic function and health. Tripartite synapses are composed of a pre- and post-synaptic neuronal terminal ensheathed by a peripheral astrocyte process (PAP). PAP-synaptic structural coupling is essential for understanding synaptic and circuit function. Stimulated Emission Depletion (STED) microscopy enables the acquisition of super-resolution images of the tripartite synapse, but an unbiased method to reliably quantify astrocyte-synaptic coupling in these images is still lacking. Here, we used two methods to quantify a set of 3-channel STED images of tripartite synapses in the ventral and lateral orbitofrontal cortex (OFC) of mouse brain sections, where pre- and post-synaptic terminals and PAPs were fluorescently labeled and appeared as puncta. In a manual method, an analyst drew linear ROIs through a trio of closely coupled (within 1 μ m diameter) tripartite puncta (pre-synapse, post-synapse, and PAP) and the average PAP-to-pre-synapse and PAP-to-post-synapse distances as a measurement of astrocyte-synaptic coupling were quantified. We then developed a batch-processing method based on SynBot (Savage et al., 2024; an ImageJ macro for quantifying colocalization in confocal images), where Python scripts were used to extract the coordinates of the tripartite synapse puncta from the images. Using the coordinates, candidates of closely coupled tripartite puncta were detected, and the average of PAP-to-pre-synapse and PAP-to-post-synapse distances were calculated, processing the entire dataset at once. Preliminary results of ongoing validation support the batch-processing approach as a high-throughput, unbiased method for quantifying astrocyte-synaptic coupling in 3-channel STED images.

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