

MARSHALL UNIVERSITY JOAN C. EDWARDS SCHOOL OF MEDICINE PRESENTS

*THE 37th ANNUAL MARSHALL UNIVERSITY HEALTH SCIENCE
RESEARCH DAY*



November 03, 2025



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.

Marshall University Joan C. Edwards School of Medicine (MUSOM) requires instructors, planners, managers, and other individuals who are in a position to control the content of this activity to disclose any real or apparent conflict of interest they may have as related to the content of this activity. All identified real or apparent conflicts of interest are thoroughly reviewed and resolved by MUSOM's planning process for fair balance, scientific objectivity of studies mentioned in the materials or used as the basis of content, and appropriateness of patient care recommendations. Disclosure information will also be presented verbally or in print to participants before the presentation of the agenda lectures.

Relevant Financial Relationship Forms are on file in the CME office and available for review upon request.

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.

2025 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.

37th Annual Research Day

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



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PLANNING COMMITTEE - NO CONFLICTS INDICATED

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Richard Egleton, PhD, Assistant Dean of the Office of Research and Graduate Education

Mindy Varney, PhD, Assistant Professor, School of Pharmacy

Krista Denning, MD, Medical Director, Marshall Toxicology, Chair, Department of Pathology

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37th Annual Health Sciences Research Day

Monday, November 03, 2025

St Mary's Center for Education

Schedule of Events

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

8:00 Gary Rankin, PhD. Chair Biomedical Sciences, Vice Dean for Research

Robert Bookwalter, PhD. Interim Provost

David Gozal, MD. PhD. (Hon), Dean of the Medical School

8:15 Oral Session 1 – Chair Dr. Krista Denning

Time	Name	Title	Abstract	Page
8:15	Harshal Sawant	Hyperglycemic adipocyte-derived exosomes aggravate oxidative stress, lipid peroxidation and mitochondrial dysfunction of brain microvascular endothelial cells in ischemic stroke		
8:30	Sidney Strause	Loss of Na/K-ATPase $\alpha 1$ Disrupts HIF-1 α -Mediated Metabolic Switch in AC16 Human Cardiac Myocytes		
8:45	Smara Sigdel	Exercise-Mediated Cerebrovascular Protection in Hypertensive Mice: BBB Modulation and Brain RAS Effects		
9:00	Shahzeb Saeed	Outcomes of Percutaneous Coronary Intervention in Patients with Rheumatoid Arthritis: A Systematic Review and Meta-Analysis		

9:15 Break

9:30 Oral Session 2 - Chair Dr. Jim Denvir

Time	Name	Title	Abstract	Page
9:30	Alexander Burbelo	Systemic Bisphosphonates Reduce the Risk of Revision After Primary Total Knee Arthroplasty: A Systematic Review and Meta-Analysis		

9:45	Olivia Coulter	Adolescent Alcohol Exposure Disrupts Astrocyte-Synaptic Structural and Functional Coupling in the Male Dorsal Hippocampus		
10:00	Yen On Chan	Single-Nucleus RNA-Seq Reveals MCT2 Cell Diversity and Regulatory Networks in Mouse Lung Cancer		
10:15	Joshua Eastman	Identifying Local Pediatric Cancer Clusters with Novel Hydrologic Modeling Method		

10:30 Break

11:00 Invited Speaker
Lynn M. Schnapp, MD, ATSF
George R. and Elaine Love Professor
Chair, Department of Medicine
University of Wisconsin School of Medicine and Public Health
“Guardians, Healers, or Troublemakers? Pericytes in Lung Homeostasis and Injury”

12:00 Lunch

12:30 Poster session # 1

1:45 Break

2:00 Oral Session 3 – Chair Dr. Trupti Joshi

Time	Name	Title	Abstract	Page
2:00	Nathan Olszewski	Sex Differences in Nicotine Self-Administration, Nicotinic Receptor Composition, and Neurophysiology		
2:15	Julia Cardot	The contribution of Serratia nuclease in the generation of deoxynucleotides via the degradation of neutrophil extracellular traps		
2:30	Lucas Stanley	Loss of PAP-Synaptic Coupling in the Female Hippocampus Following Adolescent Binge Drinking Is Mediated by Microglial Phagocytosis		
2:45	Kayla DeSchepper	Recognition Memory Before and After Injections of THC in Two Mutant CB1R Mice Strains		

3:00 Poster session # 2

4:30 Award Ceremony



Lynn M. Schnapp, MD

ATSF George R. and Elaine Love Professor Chair,
Department of Medicine,
University of Wisconsin School of Medicine and Public
Health

11:00 – St. Mary's Center for Education

Lynn M Schnapp, MD, ATSF, is the George R. and Elaine Love professor and Chair of the Department of Medicine at the University of Wisconsin -Madison School of Medicine and Public Health. Previously, she was the Division Chief of Pulmonary, Critical Care, Allergy and Sleep Medicine at the Medical University of South Carolina (MUSC), and held faculty positions at University of Washington, Icahn School of Medicine at Mount Sinai, and University of California, San Francisco. Dr. Schnapp is an active clinician and an established NIH-funded investigator in cell and molecular biology with clinical and research expertise in lung injury and repair. In particular, she is interested in why lung injury resolves under certain circumstances (e.g., Acute Respiratory Distress Syndrome (ARDS), pneumonia) but progresses to end-stage damage or fibrosis in other circumstances (e.g., emphysema or Idiopathic Pulmonary Fibrosis). To examine these questions, she uses different mouse models of lung injury to examine the regulation of matrix remodeling and the role of the alveolar myofibroblasts and lung pericytes in the resolution

of injury and fibrosis. To complement these studies, she analyzes bronchoalveolar lavage fluid and peripheral blood from patients with ARDS, and other lung diseases using cutting-edge methodologies such as transcriptomics and proteomics to identify new biomarkers, pathways and molecular targets.

Dr. Schnapp is recognized for her long-standing commitment to mentorship, career development and increasing the representation of women and underrepresented minorities in medicine. She has received numerous awards in these areas, including the American Thoracic Society (ATS) Elizabeth Rich Award, NIH Mid-Career Mentoring Award, MUSC Advancement of Women Faculty Award and University of Washington Medicine Award for Excellence in Mentoring Women and Minorities. Her national leadership experience includes serving as a member of NHLBI Advisory Council and numerous leadership positions in the American Thoracic Society, including Past President.

Oral Session 1 8:15 AM – 9:15 AM

Hyperglycemic adipocyte-derived exosomes aggravate oxidative stress, lipid peroxidation and mitochondrial dysfunction of brain microvascular endothelial cells in ischemic stroke

Sawant, H¹, Sun, B¹, Meyer, R¹, Zhu, C¹, Chen, S¹, Li, Y¹, Bihl, J¹.

¹ Department of Biomedical Sciences

~indicates presenting author

Background: Type 2 Diabetes Mellitus (T2DM), a major risk factor for ischemic stroke (IS), is characterized by hyperglycemia and adipose tissue (AT) dysfunction. AT secretes bioactive factors, including exosomes (EXs). Our previous work showed that high glucose (HG) promotes adipocyte exosome (Ad-EX) release and alters their cargo. Here, we investigated the effects of hyperglycemic Ad-EXs on brain microvascular endothelial cells (BMECs) during IS.

Methods: Ad-EXs were isolated from primary human adipocytes cultured under normal-glucose (NG) or HG (25 mM) conditions (NG-Ad-EXs or HG-Ad-EXs) and co-incubated with primary human BMECs (HBMECs) for 48 h. Hypoxia/Reoxygenation (H/R) was applied to mimic IS in vitro. Cell viability, migration, tube formation, mitochondrial membrane potential (MMP), ATP production, and reactive oxygen species (ROS) levels were assessed. Western blotting analyzed markers of oxidative stress (NOX2/4), lipid peroxidation (MDA, 4HNE, GPX4), and mitochondrial dysfunction (DRP-1, Mfn2). For in vivo validation, EXs were isolated from adipocytes of control and db/db mice (cAd-EXs, dAd-EXs) and injected into control mice after middle cerebral artery occlusion. Infarct size was measured, and neurological outcomes were evaluated.

Results: In vitro, HG-Ad-EXs reduced HBMEC viability, migration, and tube formation (~2-fold, $p < 0.05$). HG-Ad-EXs increased ROS (~1.5-fold), reduced MMP (~1.5-fold) and ATP (~0.5-fold), and dysregulated NOX2/4, MDA, 4HNE, GPX4, DRP-1, and Mfn2 expression. In vivo, Ad-EXs crossed the blood-brain barrier, localized to peri-infarct ECs, and dAd-EXs enlarged infarct size with worsened sensorimotor deficits.

Conclusion: Hyperglycemic Ad-EXs exacerbate endothelial dysfunction during IS by inducing oxidative stress, lipid peroxidation, and mitochondrial impairment, thereby worsening neurological outcomes.

IACUC approval number: 760

Loss of Na/K-ATPase $\alpha 1$ Disrupts HIF-1 α -Mediated Metabolic Switch in AC16 Human Cardiac Myocytes

~Strause, S¹, Pessoa, MT¹, Cai, L¹, Oloyede R¹, Nunley, Z¹, Gao, Y¹, Tian, J¹, Pierre, SV¹.

¹Biomedical Science Department, Joan C. Edwards School of Medicine.

~indicates presenting author

Two novel pathways by which Na⁺/K⁺-ATPase (NKA) regulates cardiac metabolism have been identified.

First, inhibition of sarcolemmal NKA-mediated ion transport elevates intracellular Na⁺ (Na_i) and decreases mitochondrial calcium, reducing the tricarboxylic acid cycle and electron transport chain. When NKA is intact, this activates hypoxia-inducible factor 1- α (HIF-1 α) and increases glycolysis. A second regulation involves NKA $\alpha 1$ /Src signaling modulation of mitochondrial metabolism without NKA inhibition, but its role in HIF-1 α and glycolysis activation during Na_i elevation remains unexplored.

We targeted NKA $\alpha 1$ by CRISPR-mediated knockout (KO) in human cardiomyocytes (AC16). A 65% reduction of NKA $\alpha 1$ expression with an 80% decrease of Na/K-ATPase activity was obtained, leading to a 2-fold increase in Na⁺. Seahorse metabolic flux analyses revealed impaired mitochondrial function (20% decrease in basal respiration, 31% decrease in maximal respiration, 56% decrease in spare capacity, and 20% decrease in ATP production; n=4-7, p<0.05). However, HIF-1 α activation did not occur, and glycolytic capacity and reserve were reduced by 21% and 31% (n=4-5, p<0.05), consistent with absence of metabolic switch. In wild-type AC16 cells, increased Na_i induced by ouabain activated HIF-1 α . In contrast, ouabain did not increase HIF-1 α in NKA $\alpha 1$ KO cells despite elevated Na_i. The hypertrophic response to phenylephrine exposure (50 μ M, 24 h) was blunted, as shown by cell area following phalloidin staining (2443 $\pm$ 58 μ m² vs 3520 $\pm$ 99 μ m² for WT, 2454 $\pm$ 70 μ m² vs 2563 $\pm$ 58 μ m² for KO, n=3, p<0.0001). These data suggest that downregulation of cardiac NKA $\alpha 1$, as in heart failure, may alter metabolic flexibility and hypertrophic response.

This abstract builds exclusively upon cell work.

Exercise-Mediated Cerebrovascular Protection in Hypertensive Mice: BBB Modulation and Brain RAS Effects

~Sigdel, S¹, Chen, S¹, Wang, J¹.

¹Biomedical Science, Marshall University Joan C. Edwards School of Medicine

~indicates presenting author

Cerebrovascular events are a leading cause of death in the United States, with stroke eliciting irreversible effects on brain tissue. Hypertension remains the most strongly correlated risk factor for ischemic stroke, making preventative strategies like aerobic exercise particularly useful. We have previously demonstrated that moderate exercise intervention has protective effects on the brain against ischemic injury in C57BL/6 mice. However, the extent to which exercise protects the blood-brain barrier (BBB) and whether exercise affects the brain renin-angiotensin system (RAS) in hypertension is unknown.

This study investigates the impact of moderate treadmill exercise on brain RAS and the BBB integrity, particularly on tight junction proteins and endothelium function, in transgenic hypertensive (Alb1) mice. Alb1 mice underwent either treadmill exercise (ET 10 m/min, 5 days/wk for 4 wks) or no exercise (nET). The brain of each mouse was halved, with half for Western Blot analysis and the other for RT-PCR. The data show that in ET-Alb1 mice (n=3-5) compared to nET-Alb1 (n=3-4), occludin and eNOS trended upward while Nox2 and MMP3 trended downwards. The p-Akt to Akt ratio increased under ET intervention. There were no significant differences in the mRNA concentrations of ACE, ACE2, AT1R, and MasR.

These findings demonstrate that moderate treadmill exercise elicits protective effects on BBB integrity by upregulating tight junction protein expression and alleviating oxidative stress. Future directions include validating findings with an increased sample size. This study presents a novel perspective on the mechanisms by which exercise improves stroke outcomes.

Outcomes of Percutaneous Coronary Intervention in Patients with Rheumatoid Arthritis: A Systematic Review and Meta-Analysis

Saeed, S¹, Khan, S¹, Mohamed, A¹, Ahmad E².

¹Internal Medicine

²Program Director Cardiovascular Disease

Introduction: Patients with rheumatoid arthritis (RA) are at increased risk for cardiovascular disease, including coronary artery disease, due to chronic systemic inflammation and traditional risk factors. Percutaneous coronary intervention (PCI) is a common revascularization strategy, but the outcomes of PCI in RA patients remain unclear. This systematic review and meta-analysis aimed to evaluate the clinical outcomes of PCI in individuals with RA compared to those without RA.

Method: We conducted a systematic review and meta-analysis following PRISMA guidelines, searching PubMed, Google Scholar, Embase, Web of Science, and Cochrane CENTRAL databases from their inception to April 2025. The primary outcomes evaluated were the incidence of major adverse cardiovascular events (MACE) within 30 days, 30-day all-cause mortality, and 30-day myocardial infarction. Odds ratios (ORs) with 95% confidence intervals (CIs) were utilized for each study, employing a random-effects model for data synthesis irrespective of heterogeneity. Statistical heterogeneity was assessed using I² statistics. All statistical analyses were conducted using Review Manager.

Results: We screened 1,300 articles and included 2 studies consisting of observational studies. Patients with rheumatoid arthritis (RA) undergoing percutaneous coronary intervention (PCI) demonstrated significantly higher risks of adverse outcomes compared to non-RA patients. RA was associated with increased odds of major adverse cardiovascular events (OR 1.20, 95% CI 1.16–1.24, $p < 0.00001$), 30-day all-cause mortality (OR 1.28, 95% CI 1.19–1.37, $p < 0.00001$), and 30-day myocardial infarction (OR 1.12, 95% CI 1.06–1.19, $p = 0.0002$).

Conclusion: In conclusion, RA patients undergoing PCI have significantly higher risks of MACE, 30-day mortality, and myocardial infarction compared to non-RA patients. These findings emphasize the need for tailored care in this population. Further studies, especially randomized controlled trials, are needed to confirm these associations.

Regarding IRB approval, it was not obtained for this study as they are meta-analyses. The research does not include direct interaction with human subjects or access to any identifiable private information. All data used for the analysis was sourced solely from publicly available and previously published materials.

Oral Session 2 9:30 AM – 10:30 AM

Hyperglycemic adipocyte-derived exosomes aggravate oxidative stress, lipid peroxidation and mitochondrial dysfunction of brain microvascular endothelial cells in ischemic stroke

Burbelo, A¹, Huffman, B¹, Stone, W¹, Cleary, L², Darbandi, A², Zafar, S¹, Singla, A², Bullock, M².

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²Marshall University Department of Orthopedics, Huntington, WV

~indicates presenting author

Introduction: Although Total Knee Arthroplasty (TKA) is highly successful, 2% of patients require revision of their TKA at 2 years and 3% of patients require revision within 5 years. This systematic review and meta-analysis aims to determine if use of systemic bisphosphonates influences revision risk after primary TKA.

Methods: This systematic review was carried out following PRISMA guidelines to identify studies between January 2009 and July 2025 that assessed the effect of bisphosphonates on revision procedures and outcomes following primary TKA. This analysis included a total of 426,920 patients, and a meta-analysis was performed using a random effects model to compare risk of revision, aseptic loosening, and periprosthetic fracture between patients who did or did not receive postoperative systemic bisphosphonates, with significance set at $p < 0.05$.

Results: After screening 253 initial results, 4 studies met inclusion/exclusion criteria, all being retrospective cohorts. A total of 104,530 patients received bisphosphonates postoperatively, while 322,088 patients did not receive any therapy. Of the four studies that assessed all-cause revision, bisphosphonate use significantly decreased the odds of revision ($p = 0.0046$, CI: 0.255-0.779, OR= 0.446) with substantial heterogeneity ($p < 0.0001$, $I^2 = 95.5\%$). Of the two studies that assessed aseptic loosening, there was no significant difference between groups ($p = 0.184$, CI: 0.348-1.226, OR=0.653) with substantial heterogeneity ($p < 0.0001$, $I^2 = 96.2\%$). Of the two studies that evaluated periprosthetic fracture, there was no significant difference between groups ($p = 0.418$, CI: 0.001-9374, OR=2.332) with substantial heterogeneity ($p < 0.0001$, $I^2 = 94.9\%$).

Discussion: Use of systemic bisphosphonates following primary TKA reduces the odds of revision by approximately 55%. Effects on aseptic loosening and periprosthetic fracture were not significant and were limited by the available studies.

IRB approval was not required for this study.

Adolescent Alcohol Exposure Disrupts Astrocyte-Synaptic Structural and Functional Coupling in the Male Dorsal Hippocampus

Coulter, O^{1,2}, Walker, CD³, Carter, T¹, Sexton HG^{1,2}, Parsons, I¹, Risher WC¹, Henderson BJ¹, Risher, ML^{1,2}.

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²Hershel “Woody” Williams Veterans Affairs Medical Center, Huntington, WV

³The Medical University of South Carolina, Charleston, SC

Adolescence is a window of heightened vulnerability to the neurotoxic effects of binge ethanol exposure (AIE). Beyond disrupting neuronal maturation and structure, AIE increases the risk of developing an alcohol use disorder and long-lasting cognitive and behavioral impairments in patients and rodent models. Our work shows that these deficits coincide with persistent astrocyte dysfunction. Astrocytes are non-neuronal cells that ensheath synapses via their peripheral astrocyte processes (PAPs) and regulate synaptic activity through bidirectional neuro- and gliotransmitter release. Recently, astrocytes emerged as critical regulators of behavioral function across many cognitive domains. Here we aim to understand how PAP-synaptic structural and functional crosstalk are disrupted following AIE to provide better mechanistic understanding of why behavioral impairments persist into adulthood.

Male Sprague-Dawley rats received dorsal hippocampal (dHipp) injections of adeno-associated viruses encoding an astrocyte-specific Ca²⁺ indicator (GCaMP6f), an adenosine sensor (GRAB_Ado1.0), or a glutamate sensor (iGluSnFR), with fiber implantation for in vivo photometry. Additional rats received hM3D(Gq) to chemogenetically activate astrocytes. Following AIE and a forced abstinence period, animals underwent contextual fear conditioning (CFC) with simultaneous fiber photometry recordings. Brains were further analyzed by immunohistochemistry, Stimulated Emission Depletion (STED) microscopy, and slice electrophysiology.

We show that AIE induces both structural and functional decoupling of PAPs from synapses. Restoring astrocytic activity via chemogenetic activation rescued fear learning deficits and normalized gliotransmitter release. These findings highlight a critical role for astrocyte-synaptic crosstalk in regulating fear learning and underscore the untapped therapeutic potential of targeting astrocytes to improve cognitive outcomes during abstinence.

MU IACUC 843

Single-Nucleus RNA-Seq Reveals MCT2 Cell Diversity and Regulatory Networks in Mouse Lung Cancer

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~indicates presenting author

The monocarboxylate transporter 2 (MCT2), encoded by SLC16A7, is a high-affinity pyruvate transporter implicated in energy metabolism and cancer. To investigate its role in the tumor immune microenvironment, we performed single-nucleus RNA sequencing (snRNA-seq) on TC1 murine lung tumors following targeted MCT2 deletion. MCT2loxP/loxP mice were generated by crossing with mCre-Tg mice and treated with tamoxifen (0.18 mg/g) or vehicle, then injected with TC1 cells (10⁶/mouse).

Tumors were harvested and nuclei isolated (~4,000/sample, n=3/condition). Libraries were prepared using 10x Genomics Chromium Single Cell 3' v3.1 and sequenced on a NextSeq 600. Data were processed with Cell Ranger v3.0.2 and analyzed in Seurat v5.2.1. KO tumors were significantly larger than controls. After filtering, 2,739 (CO) and 3,549 (KO) nuclei were retained, detecting ~16,670 genes per group. Fifteen clusters were identified; 13 were annotated with SCSA.

Differentially expressed genes (DEGs) revealed enrichment in biological processes including leukocyte adhesion, regulation of cell movement, hemopoiesis, and phosphate metabolism. Pseudotime analysis showed that B cells and Seurat cluster 10 cells in CO remained active beyond pseudotime 20, while activity in KO dropped earlier despite extending further along the pseudotime axis. CellChat analysis identified 2,555 shared ligand–receptor interactions, 1,685 unique to CO, and 1,118 unique to KO.

These results suggest MCT2 influences tumor growth and immune dynamics, affecting stromal composition, signaling interactions, and cell state progression. MCT2 appears to be a key regulator of the tumor microenvironment in TC1 lung carcinoma.

N/A

Identifying Local Pediatric Cancer Clusters with Novel Hydrologic Modeling Method

Eastman, J¹, M4, JCESOM

Finch, P², MD, Pediatric Hematology-Oncology, Marshall Health

Preston, Debor, BS, ACRP-CCRC, Pediatrics, Marshall Health

Hess, Joshua, MD, Pediatric Hematology-Oncology, Marshall Health

Background: Cancer emerges from the complex interplay of a person's genetics and environmental exposures. Pediatric cancers, which are particularly devastating to families and communities, are genetically well studied, with many known congenital driver mutations that inform clinical practice. However, ambient environmental exposures, such as carcinogens in air or water, are significantly understudied. Identifying cohorts for study and likely sources of environmental carcinogens are key missing steps in scaling research for understanding environmental drivers of pediatric cancer.

Methods: We built a cluster-identification software tool called envmed to extract spatial and temporal relationships between disease cases with respect to hydrologic networks and apply this tool to geocoded 2006-present Marshall Health pediatric (age <20) cancer data within a 60-minute driving window of CHH. We also investigate association between pediatric cancer rate and socioeconomic variables by census tract.

Results: Of 3,123 Marshall Health pediatric patients with a neoplasm diagnosis, only 260 were found to have a malignant diagnosis and address within a 60-minute drive of CHH. Using our envmed tool with these 260 cases as input, we identify 30 total pediatric cancer hydrologic clusters (rate > national or local average and N > 3 cases) along with the most likely location for water sampling within each cluster to identify a shared exposure. A robust multivariate regression across census tracts along race, income, and unemployment identifies race (% nonwhite population) as positively correlating with pediatric cancer rate ($p = 0.014$), but race x income (median HH income) interaction mitigating this effect ($p = 0.013$).

2136738-1

Oral Session 3 2:00 PM – 3:00 PM

Sex Differences in Nicotine Self-Administration, Nicotinic Receptor Composition, and Neurophysiology

~Olszewski, N¹, Shergill, M¹, Henderson, B¹.

¹Department of Biomedical Sciences, Marshall University School of Medicine

~indicates presenting author

Nicotine use is a prevalent health crisis in the United States with over 23 million being addicted. Shockingly, of the around 70% of those who use nicotine and wish to quit, only around 7% are successful. However, there remain stark sex differences in nicotine usage patterns and successful cessation attempts. Clinically, females are far more susceptible to stress-induced nicotine usage than males and, following first use, females acquire self-administration of nicotine at lower doses than males while tending to take in more nicotine. Preclinically, female rodents tend to self-administer significantly more nicotine than their male counterparts, specifically at high dosages of nicotine. However, neurobiological underpinnings of these sex-differences of nicotine use are not well documented. Here, we utilize a variety of techniques to identify distinct signatures of sex differences in preclinical nicotine use. First, using E-Vape® self-administration, we validate previous results by demonstrating females self-administer more nicotine than males. Additionally, we observed that females self-administer more zero-nicotine flavored e-liquids (vanilla). Next, utilizing RNA in situ hybridization (RNAscope), we observe stark sex differences in nicotinic acetylcholine receptor (nAChR) transcript densities in a brain region commonly associated with limitation of nicotine intake, the medial habenula (MHb). Here, we see that males have significantly more transcript for $\alpha 3$, and $\alpha 4$ nAChRs in the MHb. Finally, utilizing whole-cell patch clamp electrophysiology, we probe the reward center of the brain, the ventral tegmental area (VTA), and observe distinct sex differences in intrinsic excitability of lateral VTA dopamine neurons in response to nicotine self-administration.

The contribution of *Serratia* nuclease in the generation of deoxynucleotides via the degradation of neutrophil extracellular traps

Cardot, J¹, Bogomolnaya, L².

¹Department of Biomedical Sciences, Marshall University

Serratia marcescens is a Gram-negative multidrug resistant opportunistic pathogen associated with nosocomial infections. During *Serratia* infection, neutrophils are crucial in facilitating pathogen clearance through phagocytosis and the release of Neutrophil Extracellular Traps (NETs). NETs are composed of decondensed chromatin and decorated with around 30 different proteins including neutrophil elastase, myeloperoxidase, and cathelicidin. Some bacteria use extracellular nucleases to degrade the DNA component of NETs and avoid entrapment. Furthermore, certain Gram-positive bacteria have a surface anchored 5'-nucleotidase (AdsA of *Staphylococcus aureus*) which converts nuclease-digested NETs into deoxyadenosine (dAdo), a chemical which triggers noninflammatory apoptosis in macrophages. Production of dAdo can be monitored through quantification of orthophosphate, a byproduct of the 5'-nucleotidase mediated hydrolytic dephosphorylation of deoxyadenosine monophosphate (dAMP). *S. marcescens* produces a non-specific extracellular nuclease (NucA); however, the role of NucA in NET degradation has not been previously described. *S. marcescens* encodes a periplasmic protein, UshA (TBU70554), with 28% identity and 42% similarity to the amino acid sequence of *S. aureus* AdsA 5'-nucleotidase. UshA is a candidate enzyme for the conversion of degraded NETs into dAdo. Incubation of wild type *S. marcescens* with dAMP or NETs produced by differentiated HL-60 cells resulted in orthophosphate release. Additionally, wild type *S. marcescens* degraded and escaped from NETs while nuclease deficient Δ nucA cells were trapped and killed. Complementation restored the ability of Δ nucA to escape and generate orthophosphate from NETs. These results support our hypothesis that the degradation of NETs by nuclease is necessary for the downstream generation of deoxynucleotides and orthophosphates.

None required

Loss of PAP-Synaptic Coupling in the Female Hippocampus Following Adolescent Binge Drinking Is Mediated by Microglial Phagocytosis

~Stanley, L¹, Tysor, S¹, Seagraves, J^{1,2}, Owens, Q^{1,2}, Coulter, O^{1,2}, Ihlenfeld, A^{1,2}, Sexton, H^{1,2}, Risher, ML^{1,2}.

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Adolescence is a crucial period for neurological development. Binge drinking during this period has been associated with long-term disruption of neuronal function within brain regions involved in learning and memory. Appropriate neuronal function requires healthy synapses ensheathed by peripheral astrocytic processes (PAPs). Loss of PAP support of synapses can result in significant neuronal dysregulation. Using a rat model of adolescent binge drinking (AIE), we have demonstrated chronic PAP-synaptic decoupling within the hippocampus, a brain region critical for learning and memory. However, the underlying mechanisms driving this decoupling are unclear. Recently, using a cocaine model, it was demonstrated that PAP-synaptic decoupling can occur as a consequence of microglial phagocytosis. Our study seeks to understand whether microglial phagocytosis similarly occurs following AIE. Female rats received AIE and an intracranial injection of a viral vector expressing GFP to visualize the astrocyte outer membrane within the hippocampus. Animals were allowed to mature into adulthood. Brains were harvested, prepared for immunohistochemistry, and visualized using confocal microscopy. 3D renderings of astrocytes and microglia were generated using Imaris. GFP+ astrocytic membrane marker engulfment by microglia was quantified. Preliminary data demonstrates that AIE increases microglial engulfment of GFP+ when compared to water controls, suggesting that the loss of PAP-synaptic decoupling may be a consequence of microglial removal of PAPs. More work is required to determine why microglial pruning of PAPs occurs and how these events contribute to the synaptic and neuronal changes that persist into adulthood.

VA IACUC R003

Recognition Memory Before and After Injections of THC in Two Mutant CB1R Mice Strains

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Cannabinoids are an analgesic treatment option for pain conditions, but their long-term use can lead to memory impairment, posing a problem to their utilization as an effective therapeutic for chronic health conditions. Upon completion of cannabinoid signaling, the receptor becomes desensitized where it can no longer bind agonist and initiate signaling, then the receptor becomes internalized where it can either be degraded or recycled back to the membrane for signaling activation. Six-point mutant (6PM) mice express point mutations for six putative G protein-coupled receptor kinase phosphorylation sites of cannabinoid receptor 1 (CB1R) that are necessary for internalization. Eight-point mutant (8PM) mice express point mutations to the six GRK phosphorylation sites for internalization along with two GRK phosphorylation sites necessary for desensitization of the CB1R. In previous studies, 6PM mice displayed a reduced response to the antinociceptive and hypothermic effects of THC compared to wildtype mice, while the effects of THC on memory in these mutants are currently unknown. The goal of this study was to determine whether there were any differences between the two CB1R mutants in object recognition memory and if seven-day exposure to THC impairs recognition memory in the two CB1R mutant mice strains. Both drug naïve and THC-treated 6PM males display reduced recognition memory, whereas only THC-treated WT, 6PM females, and 8PM mice showed lower recognition memory compared to the drug naïve WT, 6PM females, and 8PM mice. This study could give insight into the role CB1R signaling may have in the memory-impairing effects of THC.

IACUC Protocol #740

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Poster Session 1

Abstract 1

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Patient and clinical predictors of explanted versus replaced spinal cord stimulator implantable pulse generators: a retrospective analysis of 145 patients

Introduction: Spinal cord stimulation (SCS) is a well-established therapy for chronic pain management. However, despite initial success, a subset of patients will undergo device explantation. Identifying predictors for SCS explantation are essential for improving patient selection and optimizing treatment outcomes. This study examines demographic, clinical, and device-related factors associated with SCS explantation compared to generator replacement.

Objectives: The primary objective of this study is to identify potential predictors associated with SCS explant by comparing patients undergoing implantable pulse generator (IPG) removal to those undergoing IPG replacement.

Methods: A retrospective observational study was conducted on 145 patients who underwent either SCS explantation (n=51) or generator replacement (n=94) between January 2018 and December 2021. Patient demographics, smoking status, body mass index (BMI), age at implant and revision, duration of implant, and device characteristics were analyzed. Statistical comparisons were made using Wilcoxon rank sum tests for continuous variables and Fisher's exact tests for categorical variables.

Results: Patients undergoing explantation had significantly shorter implant durations (median 1.9 vs. 7.5 years; $p < 0.001$) and were younger compared to generator replacement patients (median 57 vs. 65 years; $p = 0.002$). Female patients were more likely to undergo explantation than males ($p = 0.035$). No significant associations were found between BMI, smoking history, or age at initial placement and explantation risk.

Conclusion: Younger age, female sex, and shorter implant duration are significant predictors of SCS explantation. These findings may improve patient selection and counseling, optimizing long-term treatment outcomes.

None. Given IRB waiver due to nature of retrospective chart review.

Abstract: 2

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Elucidating the mechanisms of SA-4-1BBL-mediated cancer immunoprevention through advanced informatics approaches

Cancer immunoprevention leverages the immune system's surveillance mechanisms to mitigate tumor development. Vaccines constituting a tumor antigen and an immune adjuvant are perceived immunoprevention modalities. However, relevant tumor antigens are unknown for non-viral cancers, which constitute the majority of human cancers. Our group has recently shown that SA-4-1BBL, a novel oligomeric recombinant agonist of CD137 costimulatory molecule, as a single agent, has robust immunoprevention efficacy against various tumor types. In marked contrast, agonistic antibodies to CD137 lacked such function. This study employs advanced informatics approaches for analyzing bulk RNA sequencing (RNA-seq) transcriptomics data to elucidate the molecular mechanisms driving immunoprevention efficacy of SA-4-1BBL. Mice were treated subcutaneously with SA-4-1BBL or an agonistic antibody and injection site (IS) tissue and draining lymph nodes (LN) were analyzed for differentially expressed genes (DEGs).

Our findings reveal that SA-4-1BBL induces a compartmentalized and temporally dynamic immune program, characterized by early effector activation at IS and sustained immune regulation in draining LN. K-means clustering of 4,564 DEGs identified 8 functionally distinct clusters, with IS-enriched clusters (1 and 4) upregulating effector genes such as Cd28, Klra1, Cd4, Cd40 and Cd40l, supporting CD4⁺ T and NK cell activation. In contrast, LN-dominant clusters (2 and 5) were enriched for regulatory genes (Tnfrsf3, Irf5, Col1a2), implicating roles in tissue remodeling and long-term immune memory.

Compared to agonistic antibody, SA-4-1BBL elicited a more selective and durable activation of adaptive immune pathways, including TCR signaling, Th1/Th2 differentiation, and NK cytotoxicity, while avoiding systemic inflammation. Agonistic antibody, in contrast, activated broader innate inflammatory programs, including Toll-like receptor and neurodegeneration-linked pathways. IMPRes analysis revealed that SA-4-1BBL engages sequential immune-regulatory circuits centered on Stat1, Cd247, and Ifng, and modulates the CD151-TGF- β axis, offering novel mechanistic insight into its immune-balancing effects.

These findings define a compartmentalized immune architecture that underlies SA-4-1BBL's ability to provide safe, long-lasting cancer immunoprevention. Our study highlights the value of applying

comprehensive informatics techniques in decoding the spatial and functional complexity of tissue-specific immune programming.

Institutional Animal Care and Use Committee at the University of Louisville and the University of Missouri-Columbia under protocol numbers 16584 and 44387.

Abstract 3

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Exosomal miRNAs from Plasma and Saliva as Biomarkers for Childhood Asthma

Asthma, the most common chronic respiratory condition in children, is characterized by airway inflammation, hyper-responsiveness, and frequent exacerbations that worsen airflow and inflammation. Exosomes, extracellular vesicles that carry microRNAs (miRNAs) are key players in cell-to-cell communication and hold promise as biomarkers for asthma severity. This study analyzed exosomal miRNA profiles in boys with asthma, comparing those with normal lung function to those with severe airflow obstruction (SAO). Twenty boys aged 9–18 years were enrolled and divided into two groups: normal lung function (NLF): FEV1/FVC > 0.84, FEF75% > 69% predicted (n = 10) and severe airflow obstruction (SAO): FEV1/FVC < 0.70, FEF75% < 50% predicted (n = 10). Saliva and blood samples were collected for exosome isolation, quantification, and small RNA sequencing to identify differentially expressed (DE) miRNAs. Bioinformatic analyses were used to explore potential miRNA biomarkers linked to asthma severity. SAO subjects were more likely to show allergen sensitization, elevated IgE levels, and higher eosinophil counts. In total, 27 DE miRNAs were identified in plasma and 40 in saliva. Five miRNAs were consistently detected in both sample types and were associated with pathways such as neurotrophin signaling, T-cell receptor signaling, and B-cell receptor signaling. This study demonstrates that exosomal miRNAs, detectable in both plasma and saliva, differ between children with SAO and those with NLF. These molecules show strong potential as non-invasive biomarkers for personalized asthma diagnosis, treatment, and monitoring. They may also help track disease progression and treatment response, supporting further research into their application in precision medicine.

This study was approved by the Institutional Review Board (IRB), protocol number # 2079022 at The University of Missouri.

Abstract 4

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Enhancing Multi-Omics Phenotype Prediction with G2PDeep-v3: Single-Cell and Spatial Omics Integration

Predicting phenotypic outcomes from multi-omics data remains a central challenge in precision medicine and biomarker discovery. G2PDeep is an interactive deep-learning platform designed for phenotype prediction, biomarker identification, and gene prioritization. The initial release, G2PDeep v1, introduced a convolutional neural network framework, while G2PDeep v2 (<https://g2pdeep.org/>) extended support to six bulk omics layers, including mRNA, miRNA, methylation, protein, SNP, and CNV data.

In G2PDeep v3, we shift toward single-cell and spatial omics data to achieve cell-type-specific and sex-aware phenotype prediction. Leveraging metadata stratification, our framework partitions data by cell type and gender, enabling the discovery of context-specific biomarkers and improving model interpretability. A structured feature store captures high-resolution embeddings from single-cell transcriptomics and spatial omics, supporting retrieval-augmented generation (RAG) tasks.

We evaluate multiple machine learning models, including classical methods and deep learning architectures, under a 5-fold cross-validation strategy that avoids patient overlap. Interpretability modules like GeneGPT, GenePT, and OntoGPT link model-derived gene signatures to biological knowledge bases, enhancing biological insight.

By addressing challenges such as data sparsity and interpretability in high-dimensional single-cell data, G2PDeep v3 delivers a robust, metadata-aware platform for precision medicine. This approach enables accurate, stratified phenotype prediction and accelerates biomarker-driven biomedical discovery.

This study did not involve human or animal subjects, and therefore IRB or IACUC approval was not required.

Abstract 5

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Mild flexion of the femoral component sagittal alignment in TKA may improve long-term clinical outcomes and component survival: A systematic review

Background: Variations in femoral component sagittal alignment may influence clinical outcomes and survival rates following primary total knee arthroplasty (TKA). However, the optimal femoral component positioning is currently not well defined. This study aims to systematically review the influence of femoral component sagittal alignment on outcomes and potentially characterize an optimal orientation.

Methods: A systematic review was carried out following the PRISMA guidelines to identify studies in PubMed, Cochrane Library, and SPORTDiscus databases between January 2010 and April 2025 that assess the relationship of sagittal femoral component orientation and outcomes following primary TKA.

Results: After screening 2137 initial results, 10 studies met inclusion and exclusion criteria, with 9 being prospective/retrospective cohort studies and 1 Randomized Control Trial (RCT). Among the 10 studies, 5,205 TKAs were performed, with different sagittal alignment grouping thresholds for each study. Most studies (5/8) identified the optimal sagittal alignment to be approximately 1-4° flexion for their respective functional score outcomes. For range-of-motion (ROM), 5/6 studies identified the optimum sagittal angle to be between 1-7° flexion, with 4/6 suggesting an optimal component flexion of 2.5-7°. Only two studies explored failure rate, with one reporting the lowest failure rate (0%) in neutral alignment (0-3°). Anterior knee pain was only reported by one study, with best outcomes at 1.4° flexion.

Conclusion: Mild sagittal flexion (1-4°) appears to optimize functional outcomes, ROM, survival, and pain. More RCTs with consistent femoral flexion angle grouping criteria and outcome measurements are needed to explore sagittal component positioning.

IRB was not needed as this was a systematic review.

Abstract 6

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Learning Behaviors and Educational Resource Preferences Among Practicing Orthopedic Surgeons: A Survey of Trends and Priorities

Background: Regular study and resource engagement are vital for orthopedic surgeons to maintain clinical excellence. This study examined learning behaviors, specialty differences, and resource preferences in a sample of U.S. orthopedic surgeons.

Methods: A 31-question survey was distributed electronically to orthopedic surgeons, yielding 25 responses. The survey captured subspecialty, study frequency, licensing exam preparation time, habit changes over time, and educational resource use and preferences.

Results: Respondents represented diverse specialties: Sports Medicine (50%), Trauma (9.09%), Joints (9.09%), Hand (9.09%), Pediatrics (4.55%), Oncology (4.55%), and Spine (4.55%). Of all survey responders, a majority (77.27%) reported studying specialty-related content at least once a week. Most respondents (27.27%) reported spending between 41 and 60 hours studying for licensing exams. Over the last 3-5 years, respondents reported more online videos (50%), digital text-based resources (54.5%), and audio/podcast-based learning (31.82%). Study habits had remained unchanged for 22.72%. Review journal articles were the most regularly used resource (81.82%), followed by surgical videos (63.64%), and primary research articles (54.55%). Social media was the least used resource (0.00%). Primary research articles were deemed the most important resource used in practice.

Conclusion: Orthopedic surgeons continue to engage with educational content routinely, favoring online journal literature and multimedia content that is clinically relevant. Understanding these evolving preferences can inform the development of more effective continuing medical education tools tailored to surgeon needs and learning behaviors.

IRB: 2331228-1

Abstract 7

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Age-Related Differences in Pediatric Burn Characteristics: A Retrospective Analysis at Cabell Huntington Hospital

Background: Pediatric burn injuries are often unintentional and associated with significant morbidity and mortality. In Appalachia, pediatric burn management faces many challenges such as geographic isolation from specialized burn units. Although it is important to lower the incidence of unintentional burn injuries in the pediatric population, there is a lack of research that focuses on differences among age groups in the region of Appalachia. Our study aims to identify factors impacting different age groups in the pediatric population and understand which group is at a higher risk.

Methods: This retrospective study included 218 pediatric patients aged 0-18 years admitted between January

2010 and June 2023. Patients were stratified into four age groups (0-5, 6-10, 11-15, and 16-18 years). Data on gender, burn sources, length of stay (LOS), total body surface area (TBSA) affected, body mass index (BMI), and inhalation injuries were analyzed. Statistical tests included chi-squared tests for categorical variables and analysis of variance (ANOVA) for continuous variables, with significance set at $p < 0.05$.

Results: The study cohort consisted of 218 pediatric patients aged 0-18 years, consisting of 130 (56%) males

with an average patient age of 6.9 years ($SD \pm 6.2$). The cohort was further divided into four groups: 0-5 years

(109, 47%); 6-10 years (37, 16%); 11-15 years (37, 16%), and 16-18 years (35, 15%), with significant difference in distribution of patients across ($p < 0.0001$). Scald burns were most common in the 0-5-year group (80%) and 6-10-year group (75%), while flame burns were predominant in the 11-15-year group (60%) and 16-18-year group (65%). Significant variability was also noted in LOS ($p = 0.0017$), TBSA ($p = 0.0112$), and BMI ($p = 0.0003$). The average LOS was 2.42 days ($SD \pm 3.7$) in the 0-5-year group, 3.24 days ($SD \pm 4.1$) in the 6-10-year group, 3.41 days ($SD \pm 4.8$) in the 11-15-year group, and 5.8 days ($SD \pm 5.2$) in the 16-18-year group. The average TBSA was 4.36% ($SD \pm 7.3$) in the 0-5-year group, 5.16% ($SD \pm 8.1$) in the 6-10-year group, 8.51% ($SD \pm 12.6$) in the 11-15-year group, and 6.17% ($SD \pm 8.9$) in the 16-18-year group. The average

BMI was 19.56 ($SD \pm 2.3$) in the 0-5-year group, 20.81 ($SD \pm 3.1$) in the 6-10-year group, 24.11 ($SD \pm 3.8$) in the 11-15-year group, and 25.86 ($SD \pm 4.2$) in the 16-18-year group.

Conclusions: Distinct age-related patterns were observed in a number of burn patients, including burn source, LOS, TBSA, and BMI. Younger children sustained primarily scald burns with shorter hospital stays and lower TBSA, while adolescents experienced more severe flame burns and longer hospital stays with higher TBSA. These findings emphasize the need for age-specific prevention programs and resource allocation, particularly for older children facing greater burn severity. Further research should focus on long-term outcomes and refining prevention strategies.

Abstract 8

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Patterns and Predictors of Operative Mandibular Fractures in a Low Socioeconomic Appalachian Population

Mandibular fractures pose a significant public health challenge, particularly in low socioeconomic populations with limited healthcare access like Appalachia. This study investigates the influence of injury patterns and socioeconomic predictors on operative mandibular fractures in a low-income Appalachian population, ranked 46th in socioeconomic status nationally. A retrospective analysis was conducted on 98 patients with mandibular fractures treated at two level II trauma centers in Huntington, WV, from 2017 to 2021. Data included demographics, fracture characteristics (anatomy, laterality, comminution), injury mechanism (high-energy vs. low-energy), and operative status. Statistical analyses, including z-tests, chi-square tests, and t-tests, assessed factors associated with surgical intervention. Results revealed that 66.3% of patients required surgery, significantly higher than a 50% baseline ($p=0.0012$). Younger patients (mean age 34.35 vs. 45.39 years, $p=0.025$) were more likely to undergo surgery. Males comprised 75.5% of cases ($p<0.0001$), though operative rates did not differ by gender ($p=0.37$). No significant differences were found in Injury Severity Score ($p=0.93$) or hospital length of stay ($p=0.43$) between operative and non-operative groups. Additional facial fractures (e.g., maxillary, zygomatic) did not significantly increase operative rates ($p>0.05$). High-energy mechanisms (e.g., motor vehicle collisions) and fracture location (anterior/middle/posterior) showed no strong correlation with surgical intervention. These findings highlight the elevated surgical burden in this population, emphasizing the need for targeted interventions to address mandibular fracture management in low socioeconomic settings.

1991431-1

Abstract 9

~Hicks, R¹, Peterson, J, Snider, W, Hill, S, Cook, S

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Advances in Seborrheic Keratosis Treatment Options

Abstract: Background: Seborrheic keratoses (SKs) are common benign epidermal tumors that can cause significant cosmetic concerns or irritation. Although non-malignant, their appearance often leads patients to seek removal.

Purpose of Study: The purpose of this study is to provide an updated review of current and emerging treatments for seborrheic keratosis, evaluating their effectiveness, safety profiles, and impact on patient satisfaction to guide personalized, evidence-based management.

Methods: We performed a comprehensive literature review of SK treatments published from 2000 to 2025 using PubMed and major dermatology journals. Key outcomes assessed included treatment effectiveness, recurrence rates, adverse effects, and patient-reported satisfaction.

Results: Traditional treatments—such as cryotherapy, shave excision, and curettage—remain effective but are associated with risks of pigmentary changes or scarring. Recently, non-invasive therapies like topical hydrogen peroxide 40% solution have shown promise in randomized trials, offering comparable clearance rates with minimal downtime. Laser treatments, including Er:YAG and CO₂ lasers, are effective but cost-prohibitive for some patients. Patient satisfaction is highest with treatments that minimize pain, downtime, and post-treatment pigmentation changes.

Discussion: Choice of SK treatment should consider patient skin type, lesion location, cost, and cosmetic goals. Emerging therapies provide effective alternatives to traditional destructive methods, particularly for patients concerned about scarring or dyspigmentation.

Conclusion: Management of SKs is evolving beyond traditional modalities. Newer options, such as hydrogen peroxide 40%, provide effective, well-tolerated alternatives. A personalized approach based on patient preferences and lesion characteristics optimizes outcomes and satisfaction. Further studies comparing long-term efficacy and safety across treatment options are needed.

NONE

Abstract 10

~Hicks, R¹, Gozal, D¹, Ahmed, S², Khalyfa, A².

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Interplay Between Gut Microbiota and Exosome Dynamics in Sleep Apnea

Sleep-disordered breathing (SDB) is characterized by recurrent reductions or interruptions in airflow during sleep, termed hypopneas and apneas, respectively. SDB impairs sleep quality and is linked to substantive health issues including cardiovascular and metabolic disorders, as well as cognitive decline. Recent evidence suggests a link between gut microbiota (GM) composition and sleep apnea. Indeed, GM, a community of microorganisms residing in the gut, has emerged as a potential player in various diseases, and several studies have identified associations between sleep apnea and GM diversity along with shifts in bacterial populations. Additionally, the concept of "leaky gut," a compromised intestinal barrier with potentially increased inflammation, has emerged as another key player in the potential bidirectional relationship between GM and sleep apnea. One of the potential effectors could be extracellular vesicles (EVs) underlying gut-brain communication pathways that are relevant to sleep regulation and function. Thus, therapeutic implications afforded by targeting the GM or exosomes for sleep apnea management have surfaced as promising areas of research. This review explores current understanding of the relationship between GM, exosomes and sleep apnea, highlighting key research dynamics and potential mechanisms. A comprehensive review of the literature was conducted, focusing on studies investigating GM composition, intestinal barrier function and gut-brain communication in relation to sleep apnea.

N/A

Abstract 11

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Does Robotic Assistance Improve Early Outcomes in Revision Total Knee Arthroplasty? A Comparative Study

Background: Revision total knee arthroplasty (rTKA) is a well-established treatment for failed primary TKA but is associated with high complication rates and technical challenges. Robotic-assisted rTKA (rarTKA) is an emerging, off-label technique with the potential to enhance component alignment and surgical precision. We compared perioperative and postoperative outcomes between manual and robotic-assisted rTKA.

Methods: We retrospectively reviewed 148 rTKA procedures between July 2018 to March 2025 (mean 3.2 years follow-up), with 83 manual and 65 rarTKA. Fisher's exact test and Welch's t-test assessed univariate differences ($p < 0.05$ statistically significant). Multivariable linear and logistic regression analyses identified predictors of length of stay (LOS), readmissions, and 2-week postoperative range of motion (ROM).

Results: There were no significant differences in demographic characteristics or revision indications between the manual and rarTKA groups, with instability the most common revision indication. Operative time was longer in the rarTKA group than the manual group (178.2 ± 36 vs 145.2 ± 57 minutes $p < 0.001$). RarTKA trended non-significantly towards reduced LOS ($B = -14.94$, $p = 0.0757$). RarTKA was non-significantly associated with lower odds of 30-day readmission ($OR = 0.663$, 95% CI: 0.234 to 1.782, $p = 0.4219$) and 90-day readmission ($OR = 0.441$, 95% CI: 0.157 to 1.131, $p = 0.0998$). RarTKA had a negligible effect on ROM ($B = 0.109^\circ$, 95% CI: -6.62 to 6.84, 43.37, $p = 0.9744$).

Conclusion: Patients undergoing rarTKA trended toward improved postoperative outcomes despite longer operative time. Thus, we believe that rarTKA yields outcomes that are at least equivalent to those of manual revision TKA, underscoring the need for larger prospective studies.

Abstract 12

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Intraoperative Ephedrine Use Is Associated With Increased Risk of Periprosthetic Joint Infection After Total Joint Arthroplasty

Background: Periprosthetic joint infection (PJI) is a severe complication following total joint arthroplasty (TJA). Intraoperative vasopressor use has not been previously evaluated as a risk factor. This study investigates the association between vasopressor administration (phenylephrine, ephedrine, or vasopressin) and 30-day readmission, 90-day readmission, and PJI.

Methods: We retrospectively reviewed 1,286 patients (899 knees, 390 hips) undergoing primary TJA from 2020–2025. Patients were stratified by intraoperative vasopressor use. Multivariable logistic regression identified independent predictors of readmission and PJI.

Results: Of the cohort, 494 (38.4%) received no vasopressors, 557 (43.3%) received one, and 235 (18.3%) received two or more. Readmission rates at 30 and 90 days did not significantly differ by vasopressor use. However, PJI rates were higher among patients receiving ≥ 2 vasopressors (0.2% vs. 0.5% vs. 2.1%, $p = 0.02$), independent of anesthesia type. THA (vs. TKA) was the only independent predictor of 30-day readmission (OR 4.32, 95% CI 1.73–10.83, $p = 0.001$), while regional anesthesia was protective (OR 0.35, 95% CI 0.14–0.84, $p = 0.015$). Ephedrine use independently predicted increased PJI risk (OR 1.05, 95% CI 1.01–1.10, $p = 0.025$), whereas regional anesthesia remained protective (OR 0.14, 95% CI 0.03–0.57, $p = 0.006$).

Conclusion: Intraoperative ephedrine use was independently associated with increased PJI risk, highlighting the importance of intraoperative anesthetic and pharmacologic decisions. Further studies with larger cohorts are warranted to validate these findings.

Abstract 13

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Closing the Gap: A Case of Sepsis Induced High Anion Gap Metabolic Acidosis Leading to a Non Anion Gap Metabolic Acidosis Due to Resuscitation Efforts

A 68-year-old male presented to the ED with sepsis secondary to Fournier's gangrene. At that time, providers presumed elevated anion gap metabolic acidosis due to lactic acidosis and DKA and thus initiated sepsis protocol before being sent to the OR for extensive debridement. The patient received 6 liters of normal saline and 500 milliliters of albumin before the anesthesia team recognized a significant non-anion gap metabolic acidosis and switched the patient to lactated ringers to begin treatment for this new cause of acidosis. We will take a closer look into the cause and treatment of this finding in hopes to minimize future occurrences.

N/a

Abstract 14

~Masayi, E¹, Kidd, LCR², Bullard Dunn, K², Gonya, S³, Stewart, C³, Antle, B³, Logsdon, A³, Beswick, J⁴, Korfhage, T⁴.

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Metabolic diseases, including heart disease, hypertension, cancer, and diabetes, remain among the leading causes of morbidity and mortality in the United States. In Louisville, KY, these conditions disproportionately affect neighborhoods with lower socioeconomic status, contributing to reduced life expectancy compared to other areas of the city. Promoting an active lifestyle is a cornerstone of prevention and treatment for metabolic disease. Smartwatches offer a promising tool for tracking health-related behaviors such as exercise, step count, calories burned, and sleep patterns. However, barriers to their adoption in vulnerable communities remain poorly understood. This study aimed to identify factors influencing or discouraging smartwatch use among residents of South and West Louisville. Fourteen participants provided demographic information, consented to participate, engaged in focus group sessions, and completed detailed surveys. Most participants reported owning a smartwatch, with exercise monitoring as the most common use, followed by health-related tracking. Reported barriers to consistent use included cost, complexity of use, and concerns about hacking and data privacy. Although the small sample size limits generalizability, the findings suggest that while smartwatch ownership is relatively common, perceived barriers hinder their potential for broader health monitoring. Future studies with larger, more representative samples are needed to generate statistically significant results. Ultimately, better understanding these factors may inform interventions that promote equitable access to wearable technologies. By integrating smartwatch data into primary care, at-risk populations may benefit from improved chronic disease management and health outcomes.

Abstract 15

~Treadway, CJ¹, Leonardo, M¹, Sisco, J¹, Bolen, N¹, Kastigar, A¹, Brunty, S¹, Huffman, J¹, Gourley, B¹, Lipovich, J¹, Walden, A¹, Henderson, BJ¹, Dickson, PE¹.

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Intravenous fentanyl self-administration and fentanyl-induced effects on neurophysiology in mice from the genetically complex Collaborative Cross recombinant inbred mouse panel

The devastating consequences of the opioid epidemic drive the need to understand the complex polygenic factors underlying opioid use disorders. The interplay between genetic background and neuroadaptations to opioids that convey resistance or vulnerability to drug dependency remain poorly understood. To address this critical gap, we integrated behavioral and neurophysiological assays to identify genetic variation associated with the development of addiction-like behaviors and their neurophysiological correlates. To capture genetic complexity, we utilized the Collaborative Cross recombinant inbred panel and their founder strains. We quantified intravenous self-administration (IVSA) of fentanyl and, in a separate group of mice, conducted whole-cell patch-clamp electrophysiology (Ephys) and fast-scan cyclic voltammetry (FSCV) of the nucleus accumbens (NAc) following fentanyl exposure. IVSA is the gold-standard preclinical model for studying voluntary drug intake, closely mirroring aspects of human drug-taking behavior. For IVSA, mice were surgically implanted with indwelling jugular catheters before undergoing standardized fentanyl self-administration protocols. Behavioral phenotypes were quantified across acquisition, dose-response, escalation, extinction, and reinstatement phases. To examine the cellular and synaptic adaptations caused by fentanyl exposure, mice were administered non-contingent fentanyl or saline for 10 days before we used Ephys and FSCV to measure excitability and dopamine dynamics in the NAc. Data were analyzed using ANOVA with post hoc correction to reveal variation in fentanyl self-administration and neuronal activity across strains. This demonstrates that genetic complexity influences both fentanyl self-administration and its neurobiological correlates. This approach advances the field by leveraging genetic complexity within a translational framework to dissect the complex biology of opioid addiction.

Abstract 16

*~Abbud, L¹, Bane, M¹, Kassis, A¹, McCoy, O¹, Poe, K¹, Siler, A¹, Torrens, J¹, Wall, H¹, Stickler, M².

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Rural Resilience: A Healthier West Virginia (RRHWV): Continued Empowering of Rural High School Students in West Virginia Through Interactive Preventative Health Modules

Background: Rural Resilience: A Healthier West Virginia (RRHWV) study focuses on interactive, preventive healthcare modules for rural high school students. Preventive healthcare is crucial, as it establishes the foundation for a healthy, productive adulthood. It is linked to enhanced quality of life, increased life expectancy, and healthy habits—all improving individual and community health. RRHWV builds an educational approach with objectives of enhancing medical literacy and measuring students' comfort in discussing topics with healthcare professionals.

Methods: This one-month study delivers four modules—Substance Abuse, Physical Activity/Obesity, Adult Education, and Mental Health Services to rural high school students, expanding on a pilot at Spring Hill High School. Students' awareness, knowledge, and comfort discussing these topics are measured using pre- and post-surveys administered anonymously via RedCap. Statistical analysis will include a Kolmogorov-Smirnov test for normality and a two-tailed paired t-test to assess differences in pre- and post-training scores for each module.

Results: A pilot study has been completed, in which positive results were shown. This continuation is set to conclude in October and aims to expand the original study. Preliminary hypotheses suggest an increase in student knowledge, comfort, and willingness to discuss these topics with healthcare professionals.

Conclusions: RRHWV seeks to demonstrate that interactive modules improve students' knowledge and comfort discussing preventive healthcare, with the Mental Health Services module expected to yield the greatest statistical impact based on pilot data. Continued statewide expansion in rural high schools could enhance health literacy, promote early interventions, and improve long-term outcomes in underserved communities.

2317420-1

Abstract 17

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Synthetic Nicotine and Nicotine Analogs with Effects on Mouse Behavior and Dopamine Release

Nicotine's addiction liability has been well studied and documented. Recently the FDA increased regulations on tobacco derived products, which has lead manufacturers of electronic nicotine delivery systems (ENDS) to use different nicotine analogs (6-methylnicotine, synthetic nicotine, etc.) to avoid these regulations. We will test behavioral, physiological and biochemical implications in the brain of these nicotine analogs, against tobacco derived nicotine and vehicle control (PGVG). We will do this through our E-Vape Self Administration (EVSA) to test the behavioral aspects of these analogs, as well as Fast-Scan Cyclic Voltammetry (FSCV) to test the chemical reasoning as to why these behavioral aspects happen. This will help with understanding the differences between nicotine versus these nicotine analogs, and how this affects brain physiology. The hypothesis is that these analogs will not only act similarly to nicotine, but will worsen effects on these physiological and biochemical processes in the brain, because the electron density differs between these nicotine analogs that could lead to tighter and longer binding to nicotinic receptors compared to nicotine. This could lead to an increase in addiction liability as well as increase in stress, anxiety, and withdrawal symptoms. More research is needed to test the effects of these analogs and to possibly see more FDA regulations in the future.

Abstract 18

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NeuroAppalachia: Advancing Neuroscience Education for Rural High School Students in Appalachia

NeuroAppalachia is an educational initiative aimed at inspiring high school students from a rural West Virginia county, Boone County, to pursue careers in healthcare, addressing the critical shortage of healthcare professionals in these rural regions. The program introduces students to neuroscience through interactive virtual lessons and a hands-on sheep brain dissection, offering a tangible connection to brain function and healthcare. By targeting students in rural areas where access to medical education and resources is limited, NeuroAppalachia seeks to foster interest in healthcare careers and provide a replicable model for increasing medical career engagement among rural and underprivileged populations. This project explores the impact of a virtual neuroscience program on the interests, understanding, and career aspirations of high school students in rural Appalachia. The one-week program includes daily lectures and a hands-on sheep brain dissection. Impact will be assessed through pre- and post-program surveys and interviews.

This project is an educational outreach program and does not involve human subjects research or the use of live vertebrate animals; therefore, IRB and IACUC approval are not required.

Abstract 19

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Exploring the Neurological Impact of Prematurity: Shared Mechanisms in Periventricular Leukomalacia (PVL), Intraventricular Hemorrhage (IVH), and Hydrocephalus

Premature birth (<37 weeks gestation) is a leading cause of neonatal morbidity and mortality, with brain injury representing a major contributor to long-term disability. Periventricular leukomalacia (PVL), intraventricular hemorrhage (IVH), and hydrocephalus are among the most common neurological sequelae in preterm infants, sharing overlapping risk factors, pathophysiological mechanisms, and outcomes. PVL results from ischemia, excitotoxicity, and inflammation targeting pre-myelinating oligodendrocytes, leading to white matter loss and impaired connectivity. IVH arises from rupture of fragile germinal matrix vessels in the setting of hemodynamic instability, while hydrocephalus often develops secondarily to IVH through impaired cerebrospinal fluid absorption and inflammatory injury. Extreme prematurity, hypotension, infection, ventilatory complications, and genetic variants affecting vascular or neural development increase susceptibility to all three conditions.

Diagnosis typically begins with cranial ultrasound, with MRI and advanced modalities (diffusion-weighted/tensor imaging) improving detection of subtle injury. These conditions are strongly associated with cerebral palsy, cognitive impairment, seizures, and significant healthcare costs. Preventive strategies—antenatal corticosteroids, magnesium sulfate, delayed cord clamping, and optimized ventilation—reduce risk, while hydrocephalus often necessitates ventriculoperitoneal shunting or endoscopic third ventriculostomy. Emerging therapies, including erythropoietin, melatonin, stem cell transplantation, and targeted anti-inflammatory strategies, show promise but remain largely preclinical.

PVL, IVH, and hydrocephalus reflect shared vulnerabilities of the premature brain's vasculature and white matter. Advances in prevention, early detection, and regenerative approaches hold potential, but translation to effective neonatal interventions remains an urgent priority.

Literature review, no patients were included

Abstract 20

*~Kanaan, A¹, *~Zafar, S¹, Ashraf, SA^{2,3}, Sridharan, D^{2,3}, Khan, M^{2,3}

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A 3D-cardiac organoid to model “myocardial infarction in a dish”

Introduction: During myocardial infarction (MI), an obstruction in the coronary artery causes a cessation of blood flow and the resulting ischemia triggers molecular changes in the different cardiac cell-types: cardiomyocytes (CMs), endothelial cells (ECs), and cardiac fibroblasts (CFs). To develop therapies for MI, delineating cell-specific molecular changes is critical, but is challenging in the complex in vivo system. In this regard, 3D-organoids can bridge this gap by recreating the cardiac tissue structure in vitro.

Methods: We generated 3D-cardiac organoids using a combination of CMs, ECs, and CFs, derived from human induced pluripotent stem cells (hiPSCs). Each organoid was comprised of 10000 cells (6000 CMs, 2000 ECs, and 2000 CFs). The morphology of the organoids was assessed via phase-contrast and confocal microscopy. To model MI in vitro, we subjected the organoids to hypoxia (1% O₂) and evaluated their Ca²⁺ transients and LDH release.

Results: The organoids attained their peak contractility within 3-5 days after formation. Immunostaining with cell-type-specific markers (CMs: troponin T; ECs: CD31; CFs: vimentin) showed the presence of CFs on the exterior and CMs and ECs in the interior of the organoids. ECs appeared to form a tube-network possibly modelling the cardiac vasculature. However, contrary to our expectations, we observed an increase in Ca²⁺ and a decrease in the LDH release in the organoids as compared to their normoxia controls.

Conclusion: While the 3D-organoids can model the cardiac tissue structure accurately in vitro, further investigations will be required optimize their use for modeling MI in a dish.

N/A

Abstract 21

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Experimental and modeling studies of the effects of aging and changes in skeletal stiffness on force detection in insects

Increases in stiffness of body structures often occur in aging, concomitant with decreases in muscle mass. These changes can impede walking and turning movements. Potential effects of these changes on proprioceptive sensory signals have been less well studied. We are examining the effects of aging and skeletal stiffness on sense organs that detect forces in the legs of insects by 1) measuring exoskeletal stiffness in juvenile and adult cockroaches (*Periplaneta americana*) using an Aurora (300) dual mode lever system and 2) characterizing the responses of tibial campaniform sensilla (which encode strains in the exoskeleton) at different stages of development and sclerotization. At all stages of growth, the tibial sensilla respond vigorously to bending forces imposed as ramp and hold functions upon the tibia (with joint movement resisted). The sensitivities of sensilla in juvenile (softer cuticle) and adult (stiffer) were compared by measuring the discharge frequencies at different levels of imposed force. Sensitivities of sensilla in juvenile animals (11th instar, pre-adult molt) were much greater to lower levels of force than adults after the succeeding, last molt. Our data indicate that the range and sensitivities forces change substantially during the final stage of development. The slopes of plots of firing frequency vs. force were juveniles (slope = .617) as compared to adults (slope = .286), hardened after the single final molt, while the range of force detection increased three fold. These findings support the idea that the sensory systems of insects are adaptively tuned to changes in body structure in aging.

Insects only; past IRBNet ID# 1563155-1

Abstract 22

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Long-Term Outcomes of Partial Nephrectomy Versus Percutaneous Ablation for Renal Cell Carcinoma: A Propensity-Matched Analysis

This study compares peri-procedural outcomes and long-term survival in patients with renal cell carcinoma (RCC) treated with partial nephrectomy or image-guided ablation. Using the TriNetX multi-institutional electronic health record database, adult patients who underwent partial nephrectomy, cryoablation, or heat-based ablation from 2004 to 2025 were identified. Cohorts were balanced using propensity score matching for age, comorbidities, renal function, and BMI. Outcomes included complications, ICU admission, transfusion, hospital stay, reintervention, and 10-year survival and metastasis rates.

After matching, 9,374 partial nephrectomy, 2,169 cryoablation, and 1,003 heat-based ablation cases were analyzed. Partial nephrectomy had higher rates of complications, with longer hospital stays (1.2 vs. 0.4 and 0.3 days), ICU admissions (4.0% vs. 1.4% and 1.0%), and transfusions (4.3% vs. 1.4% and 0.9%) compared to ablation (all $p < 0.01$). However, ablation showed higher 10-year reintervention rates (cryoablation 13.0%, heat-based 9.6%) than partial nephrectomy (1.3%). Survival rates were comparable: 89.4% for partial nephrectomy, 89.2% for cryoablation, and 87.8% for heat-based ablation. Rates of metastatic treatment were also similar.

These findings suggest that while partial nephrectomy is associated with more peri-procedural risk, it may reduce long-term reintervention. Ablation offers a less invasive alternative with similar long-term outcomes, particularly for patients with elevated surgical risk. Results support ablation as a valid treatment option in select patients and emphasizes the importance of individualized planning.

010708

Abstract 23

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Enhancing Medication Safety in the Anesthesia Pyxis By Improving Identification of the Look-Alike Medications Phenylephrine and Dexamethasone: A Quality Improvement Project

Look-alike sound-alike (LASA) medication errors represent a significant safety concern in anesthesiology, where rapid decision-making in high-pressure environments increases the potential for harm. At our institution, dexamethasone and high-concentration phenylephrine, two medications with similar appearance, were previously stored in adjacent receptacles within the anesthesia Pyxis system, increasing the risk of selection error. To address this, we conducted a quality improvement project using the Plan-Do-Study-Act (PDSA) framework. Interventions included applying LASA-specific warning labels to medication receptacles in 19 operating rooms and switching vendors to supply phenylephrine vials with a distinctly contrasting appearance from dexamethasone. Over a 4-month period following implementation, we monitored the incidence of reported medication errors involving these two drugs and distributed surveys to anesthesia providers assessing their confidence in correctly identifying medications post-intervention. This project aims to evaluate whether targeted labeling and procurement changes can reduce LASA-related errors and enhance provider confidence, contributing to safer medication practices in the perioperative setting.

none required

Abstract 24

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Macrophage CD11b-positive Cell Depletion Improves Metabolism in a Mouse Model of Sleep Apnea

Intermittent hypoxia (IH), a key feature of obstructive sleep apnea (OSA), promotes inflammation, metabolic dysfunction and insulin resistance. In adipose tissue, IH drives a pro-inflammatory state in which macrophages are central mediators. To determine whether removing these cells improves metabolic outcomes, we used CD11b–diphtheria toxin receptor (DTR) transgenic mice, in which diphtheria toxin (DT) selectively eliminates monocytes and macrophages. Male and female DTR mice were exposed to IH or room air (RA) for six weeks. DT was administered to deplete CD11b⁺ cells. We assessed insulin sensitivity, metabolic parameters, macrophage content in multiple tissues, adipose and liver histology, cytokine/adipokine profiles, and senescence-associated secretory phenotype (SASP) markers by immunofluorescence and gene expression analysis. CD11b⁺ cell depletion in IH-exposed mice significantly improved metabolic function and insulin sensitivity. Macrophage markers (F4/80, CD11b) and SASP markers (p16, p21, IL-16) were markedly reduced at both mRNA and protein levels in several metabolic organs, including visceral adipose tissue. These findings indicate that activated CD11b⁺ cells contribute to IH-induced inflammation and metabolic dysfunction. Targeting these cells may represent a potential therapeutic approach for improving metabolic health in patients with OSA.

IACUC protocols # 9586 (university of Missouri) and 840 and 841 (Marshall University)

Abstract 25

~Gray, D¹, Huffman, A¹, Burbelo, A¹, Shaver, A², Lowden, B², Lycans, D².

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Return to Play Timeline After ACL Reconstruction

Background: Anterior Cruciate Ligament (ACL) injuries are common in young athletes and often require surgical reconstruction. Standard return-to-sport (RTS) following ACL reconstruction (ACLR) is typically around 9 months. Use of an internal brace alongside the graft may provide additional strength and stability, potentially allowing for a safer and earlier RTS.

Purpose: To evaluate outcomes of ACLR with internal brace augmentation in young athletes, focusing on RTS timing and safety.

Study Design: Case series; **Level of Evidence:** IV

Methods: This retrospective study reviewed 33 patients aged >14 and <31 who underwent primary or revision ACLR with an internal brace between 2020 and March 2025, performed by a single sports medicine-trained surgeon. Follow-up averaged 2.33 years. Outcomes included RTS rate, RTS timing, IKDC scores, and graft rupture incidence.

Results: Among 39 athletes eligible for RTS, 33 (84.6%) returned to sport. The average RTS time was 7.06 ± 2.3 months. Of the RTS group, 9.1% did not return to their previous level of play. The graft rupture rate was 5.1%. Average IKDC scores were 84.23 ± 14.18 overall and 87.74 ± 11.94 among those who returned to sport.

Conclusion: ACL reconstruction with internal bracing may support an earlier return to sport without increasing reinjury risk. Functional outcomes and IKDC scores were comparable to traditional ACLR techniques. Further research with larger cohorts is needed to confirm these findings and refine surgical decision-making.

Keywords: ACL, ACL reconstruction, internal brace, suture tape augmentation, return to sport

Abstract 26

Attal, N¹, ~Dahshan, H¹, Potts, C¹, Issa, J¹, Alizai, U², Gibson, J¹.

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Spinal Myxopapillary Ependymoma in a 26-Year-Old Male: A Missed Window for Early Tumor Detection

Background:

Myxopapillary ependymoma is a rare, slow-growing tumor of the conus medullaris and cauda equina that may mimic benign causes of low back pain. Its indolent progression can delay diagnosis, especially in young adults where musculoskeletal etiologies are often presumed.

Case Presentation:

A 26-year-old male presented with a 1.5-year history of progressive lumbar pain, lower extremity weakness, sensory changes, and intermittent urinary retention. Early evaluations, including multiple clinic visits and plain radiographs, revealed only mild degenerative changes, which delayed further investigation with advanced imaging.

Imaging Findings:

MRI demonstrated a T12–L4 intradural, heterogeneously enhancing mass with significant vertebral body erosion and nerve root involvement. CT of the chest, abdomen, and pelvis showed no metastatic disease but incidentally revealed splenomegaly. Radiologic features were most consistent with myxopapillary ependymoma. The patient was transferred to a tertiary care center for definitive management.

Discussion:

This case highlights the diagnostic challenge of spinal tumors presenting with chronic back pain in young adults. While initial imaging may appear benign, progressive neurological symptoms, particularly urinary retention, should prompt urgent spinal MRI. Delayed recognition of myxopapillary ependymoma risks irreversible neurological deficits due to prolonged compression of the cauda equina.

Conclusion:

Chronic back pain with evolving neurological signs warrants a high index of suspicion for intradural pathology. Normal or minimally abnormal plain films do not exclude serious disease. Early use of advanced imaging can improve detection and optimize surgical outcomes in patients with potentially curable spinal tumors such as myxopapillary ependymoma.

No number required, case study.

Abstract 27

~Kandula, A¹, Weisenmuller, C², Calderwood, L².

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²CAMC

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Factors Predicting Initial Diagnosis of ADHD in Adults

Background: Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder affecting both children and adults, with untreated symptoms often resulting in significant psychosocial impairment. Identifying factors that predict an initial ADHD diagnosis in adulthood may help clinicians recognize symptoms earlier, reduce misdiagnosis, and improve long-term outcomes. This study aims to identify such predictive factors in adults evaluated for ADHD.

Methods: A retrospective chart review was conducted using de-identified data from the Adult ADHD Evaluation Clinic in the Department of Behavioral Medicine and Psychiatry (October 2024–June 2025). Eligible participants were ≥18 years old, out of high school, evaluated in person; cases were excluded if the evaluation was incomplete. Key variables included DSM-5 criteria, substance use, and clinical assessment results. Interim analyses (n=37) compared adults diagnosed with ADHD versus those without, using chi-squared and Fisher's exact tests in SAS Studio 3.8.

Results: Participants had a mean age of 36 years and were predominantly single, white, and female. Adults without a prior ADHD diagnosis were less likely to meet criteria for ADHD if they did not demonstrate presence of and impairment by childhood symptoms ($p=0.0489$). Absence of DSM-5 childhood criteria C/D was strongly associated with a lower likelihood of adult ADHD diagnosis ($p=0.0042$). Interestingly, individuals diagnosed with ADHD scored higher on the Subtle ADHD Malingering Scale (35.25 vs. 34.3), suggesting potential symptom overreporting among self-referred patients.

Conclusion: Preliminary findings highlight the importance of comprehensive psychological assessment, incorporating multiple methods and collateral information, to improve diagnostic accuracy. Recognizing these predictors may help clinicians reduce misdiagnosis and optimize treatment for adults presenting with ADHD symptoms.

25-1205

Abstract 28

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The mother-daughter connection: Does maternal PCOS impact biomarkers and metabolic factors in young adolescents?

Polycystic ovarian syndrome (PCOS) presents as anovulation and hyperandrogenemia, such as acne, hirsutism, and/or elevated testosterone, yet developmental origins are poorly understood. Hyperandrogenic symptoms increase with obesity, insulin resistance (IR), and family history. It is unclear how the interplay of these factors develop to PCOS, thus diagnosis cannot be made until two years post-menarche. This study aims to bridge this gap.

Methods: This cross-sectional cohort study includes premenarchal adolescents 8-13 categorized by maternal PCOS and then further divided based on BMI. Premenarchal is defined as Tanner II-IV pubertal stages without menarche. Participants will be evaluated by a pediatric gynecologist and undergo laboratory studies for luteinizing hormone, follicle stimulating hormone, insulin, lipid panel, free and total testosterone, dehydroepiandrosterone sulfate, 11-ketotestosterone, and bile acids. Comparisons will be made between PCOSd and controls along with BMI categories.

Expected Results: Primary outcomes are bile acids, androgen levels among groups based on maternal PCOS and body mass index. We anticipate that bile acids will show altered pool sizes in PCOS(d) compared to controls, in addition to elevated androgen levels. Obesity is expected to have a stronger influence on androgens and lipids and insulin, but not bile acid levels.

Conclusion: This study will help clarify the role of bile acids and metabolic factors in the early pathogenesis of PCOS. By stratifying premenarchal adolescents by BMI and familial PCOS, we aim to understand the genetic risk and elucidate its metabolic origins. Earlier detection of this syndrome could allow for earlier identification, targeted therapies, and lifestyle modifications.

2138727-1

Abstract 29

~Lyu, Z^{1,2}, Bottoms, C², Sinn, M³, Featherston, J³, Cleavinger, K⁴, Turabelidze, G⁴, Bos, J⁴, Markham, M⁵, Koffarnus, N⁴, Joshi, T^{1,2,6,7}.

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Empowering Covid (SARS-CoV-2) Virus Genomics Surveillance for Missouri using Data Analytics and Integration Portals

To enhance understanding of SARS-CoV-2 prevalence in Missouri, we collaborated with the MO Department of Health and Senior Services and MO State Public Health Laboratory. Our objective was to design a bioinformatics data analytics pipeline and a Covid-19 Genomics Surveillance Portal to provide local authorities with real-time, detailed information.

The analytics pipeline incorporates sequence and variant effect annotations, phylogenetic and cluster analyses, and geospatial mapping. Using SARS-CoV-2 genome sequencing data from patient specimens, the pipeline aims to identify genetic variations, assess demographic trends, and determine similarities to other variants.

The Covid-19 Genomics Surveillance Portal (<https://dataportals.missouri.edu/SARSCoV2>) integrates information of all sequenced samples from MSPHL with analyzed results for other samples from commercial labs. It provides details about variant proportions, trends of variants of concern (VOC) over period, variants by county, and frequency of top 10 mutations in S gene. The portal is updated weekly, and data is submitted to GISAID. Additional data analytics are underway for studying mutation patterns and hotspots observed in the different variants for understanding future trends.

By leveraging data analytics and integration portals, Missouri can proactively monitor and respond to the evolving dynamics of the COVID-19 virus. The project's outcomes enhance public health management and preparedness for future infectious disease challenges.

Not applicable. This study does not require IRB or IACUC review.

Abstract 30

Potts, CE¹, Carter, R¹, ~Schmidt, C¹, Wall, H¹, BS, Alizai, U², Gibson, J³.

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Radiologic–Pathologic Correlation in a Large Lumbar Intradural Tumor with Vertebral Erosion

Case presentation: A 26-year-old male presented with a 1.5-year history of progressive lumbar pain, bilateral lower extremity weakness, sensory deficits, and intermittent urinary retention. MRI of the lumbar spine revealed an intradural, heterogeneously enhancing mass extending from T12 through L4. The lesion displaced the cauda equina peripherally, eroded the posterior vertebral bodies of L1–L3, and demonstrated paraspinal muscle edema. Thoracic MRI was unremarkable. CT chest, abdomen, and pelvis showed no metastatic disease but confirmed vertebral scalloping and splenomegaly.

The differential diagnosis included myxopapillary ependymoma, lymphoma, and astrocytoma. The lesion's conus-based location, intradural confinement, heterogeneous but well-defined enhancement, and chronic bone remodeling favored myxopapillary ependymoma. The patient was transferred for surgical management.

Discussion:

This case highlights the role of MRI in defining tumor extent, neural element involvement, and secondary bony changes, while CT complements by demonstrating osseous remodeling and excluding systemic disease. The degree of vertebral erosion without aggressive periosteal reaction suggested slow tumor growth, correlating with the patient's chronic course.

Conclusion:

Intradural lumbar tumors with nerve root displacement and vertebral scalloping warrant consideration of myxopapillary ependymoma. Multimodal imaging is critical for narrowing the differential, guiding biopsy or resection planning, and anticipating surgical challenges.

No IRB approval needed for case studies

Abstract 31

Bullock, M¹, Caughran, A¹, Morgan, C¹, Lowden, B¹, *Burbelo, A², *~Annan, Cedric², *Crawford, K².

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Can Robotic Assistance Overcome the Challenges of Obesity in Aseptic Revision Total Knee Arthroplasty? A Preliminary Report

Background: Obesity is a known risk factor in orthopaedic surgery, but its effect on outcomes in robotic-assisted revision total knee arthroplasty (rarTKA) is still uncharted. This study examines the association between body mass index (BMI) and key perioperative and early postoperative outcomes in aseptic rarTKA.

Methods: This retrospective, observational study analyzed 55 patients who underwent off-label aseptic rarTKA using the Stryker Mako system at a single academic center between 2020 and 2025, excluding patients with infection-related revision indications. The cohort was stratified into high and low BMI groups using the median BMI of 34.1 kg/m². Outcomes included operative time, length of stay (LOS), postoperative range of motion (ROM), and 30-/90-day readmission rates.

Results: There were no statistically significant differences between the high BMI (n=28) and low BMI (n=27) groups in operative time (175 vs 176 minutes; p=0.898), LOS (31.71 vs 30.22 hours; p=0.779), 2-week postoperative ROM (107.5° vs 102.5°; p=0.474), or 30/90-day readmission rates (17.9% vs 7.4%, p=0.449 and 14.3% vs 7.4%, p=0.700, respectively).

Conclusion: In this study, elevated BMI was not associated with inferior perioperative or early postoperative outcomes in aseptic rarTKA patients. These preliminary observations highlight the potential of robotic technology to mitigate the technical challenges associated with obesity in complex revision cases. However, this study is severely limited in power and only assesses short-term outcomes. Larger prospective studies are needed to validate this conclusion, especially in comparison to manual rTKA.

#2205529-2

Abstract 32

Singh, R¹, Koempel, A¹, French, B¹, ~Crawford, C^{1,2}, Perlow, HK³, Rauh, S⁴, Kutuk, T¹, Beyer, S¹ Grecula, J¹, Blakaj, D¹, Zhu, S¹, Raval, RR¹, Kotecha, R⁵, Chen, WC⁶, Raleigh, DR⁶., Frechette, KM⁷, Lehrer, EJ⁷., Khazanchi, R⁸, Chaliparambil, R⁸., Sadagopan, NS⁸, Ho, A⁹, Youngblood, MW¹⁰, Sachdev, S⁹, MD, Magill, ST¹⁰, Burgess, L¹¹, Sahgal, A¹¹, Deng, MY⁴, Debus, J⁴, Konig, L⁴, Palmer, JD¹.

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Improved progression-free survival following dose-escalated vs. standard dose post-operative radiation therapy for high-risk meningiomas: A Pooled Individual Patient Level Multi-Institutional Meta-Analysis (FIRESTORM)

Purpose/Objective(s): We performed an individual patient level meta-analysis for high risk meningiomas comparing progression-free survival (PFS) with dose-escalated radiation therapy (DE-RT) vs. standard-dose post-operative radiation therapy (SD-RT).

Materials/Methods: A total of 7 institutions participated. We defined DE-RT as receipt of a biological effective dose (BED10) of 79.2 Gy or greater. PFS was defined as achieving stable disease, partial response, or complete response at the treated site and absence of marginal or distant failure from the end of RT to time of last follow-up. We compared PFS with DE-RT vs. SD-RT via Kaplan-Meier analysis and log-rank t-tests, a Cox proportional hazards multivariate model, and propensity score analyses with inverse probability treatment weighting (IPTW).

Results: The analysis including 248 patients with high risk meningioma (59 received DE-RT and 189 received SD-RT). One-hundred and eighty-eight cases (75.8%) were WHO Grade 2, and 103 cases (41.5%) were recurrent meningiomas. Extent of resection was STR in the majority of cases (182; 75.2%). The median BED10 for the DE-RT and SD-RT arms were 82.9 Gy (range: 79.2-93.8 Gy) and 70.1 Gy (range: 26.4-78.4 Gy), respectively. DE-RT was associated with superior PFS rates at 3- (86.4% vs. 55.6%) and 5-years (65.8% vs. 38.8%; p=0.0022). On Cox MVA, controlling for Grade, extent of resection, and de novo vs. recurrent disease, patients who received DE-RT had superior PFS (hazard ratio (HR)=0.51(95% CI: 0.34-0.76); p=0.001). On IPTW, DE-RT continued to be associated with superior PFS (HR=0.50 (95% CI: 0.32-0.78;

p=0.003).

Conclusion: DE-RT resulted in superior PFS for patients with high risk meningiomas over SD-RT.

OSU 2024C0032

Abstract 33

Burbelo, A¹, ~Phelps, A¹, Keaveny, A¹, Potts, C¹, Cleary, L², Shepherd, J³, Bullock, M².

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Intraoperative Hypotension Is Associated With Increased Risk of Cardiac and Renal Readmissions Following Total Joint Arthroplasty

Intraoperative hypotension (IOH), commonly defined as mean arterial pressure (MAP) reduction of 20% or greater (relative threshold), has emerged as a potential contributor to adverse outcomes in surgical patients. However, its role in adverse outcomes following total joint arthroplasty (TJA) is not well described. This study aimed to investigate whether intraoperative hypotension is a risk factor for readmission following TJA. We retrospectively reviewed 1076 TJA patients (749 knees and 327 hips) at our institution between September 2020 and April 2025. Demographic characteristics, intraoperative data, and postoperative readmissions were extracted. Fisher's exact test was used to compare readmission rates between groups based on hypotension status. Patients experiencing IOH (n= 895) were slightly older (65.2 years) compared to the non-IOH group (n=181, 64.14 years, p = 0.21), more of them were male (41.9% vs 39.8%, p = 0.63), and their mean body mass index was slightly higher (35.43 vs 35.31, p = 0.76). Patients in the IOH group had a higher relative change in MAP (33.8% vs 12.8%, p < 0.001) and a lower overall risk of 90-day readmission (2.5% vs 8.3%, p = 0.2277), but a significantly higher number of readmissions (54.55% vs 0%, p = 0.00087) due to complications related to cardiac/renal/vascular (CRV) issues, such as arrhythmia or acute kidney injury (AKI).

2313070-2

Abstract 34

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Syphilitic Myelitis: Rapid Clinical and Radiological Improvement Following Antibiotic and Steroid Therapy

Neurosyphilis is a CNS infection caused by *Treponema pallidum* that typically occurs in late syphilis and can cause meningitis, meningovascular stroke, dementia, and spinal pathology. Syphilitic myelitis is a rare manifestation of late neuro-syphilis with a paucity of documented cases. In the US, prevalence may be as high as 1.5% of cases. It can mimic inflammatory conditions that cause transverse myelitis, potentially delaying appropriate and timely treatment. The standard therapy for neurosyphilis is IV penicillin 18 to 24 million units per day for 10–14 days, but no clear guidelines exist for concomitant steroids in cases with spinal cord enhancement.

A 47-year-old female presented 3 weeks after onset of vitiligo, weakness, imbalance, and urinary incontinence. Her exam revealed ataxic gait, loss of vibration sense at T6, 3+ DTRs in the lower extremities, and bilateral Babinski signs. Serology was positive for RPR and *T.pallidum* antibodies, with CSF showing a VDRL Titer of 1:4, elevated WBC, and lymphocytic pleocytosis. MRI showed long-segment T2 flare changes involving the posterior columns and enhancement from T6–T10. IV penicillin (25 million units/day) was initiated. After 3 days her neuropathy progressed into the cervical dermatome, prompting initiation of IV methylprednisolone (1000mg). A follow-up MRI after one dose of steroids showed remarkable improvement of enhancement. The patient's upper extremity symptoms resolved, and lower extremity symptoms improved significantly. She continued IV steroids for 5 days, followed by oral prednisone taper while completing her penicillin course.

This case highlights the benefit of combining penicillin with steroids in treating neurosyphilis complicated by syphilitic myelitis. Early source control for 2–3 days followed by high dose IV steroids resulted in rapid radiological and clinical improvement. We postulate this approach may yield quicker recovery than antibiotics alone or possibly when both antibiotics and steroids are initiated simultaneously on the same day.

This study is a single-patient case report and did not require IRB or IACUC approval.

Abstract 35

*~Ahmed Khan, M¹, Lanata, MM¹, Tufts, L¹, Garst, M¹, Schade, M², Wallace, T¹.

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Unraveling Atypical Osteomyelitis: Rare GBS Infection in an Adolescent With Diagnostic Dilemma

A healthy 16-year-old cheerleader presented with two weeks of progressive left lower back, hip, and knee pain, initially attributed to overuse. Despite normal outpatient radiographs and conservative care, symptoms worsened with new difficulty bearing weight, prompting an Emergency Department visit. Labs revealed neutrophilic leukocytosis and elevated inflammatory markers, though imaging was unremarkable. She was discharged after improvement with analgesia for outpatient follow-up.

Forty-eight hours later, she returned with fever, worsening pain, lumbar swelling, altered gait, and new onset urinary incontinence. Repeat labs showed worsening leukocytosis and inflammatory markers. Lumbar spine MRI revealed a left paracentral L5-S1 disc herniation, prompting neurosurgical consultation and admission.

Blood cultures grew GBS; IV ampicillin was started per infectious disease recommendations. Given ongoing infection, neurosurgery deferred immediate intervention. Persistent hip pain and lack of prior imaging led to pelvic MRI, which revealed sacroiliac septic arthritis, adjacent osteomyelitis, myositis, and an 8 × 4 mm abscess (Figure). CT-guided drainage confirmed GBS. Her bacteremia resolved rapidly, and incontinence improved with antibiotics. She transitioned to oral amoxicillin, completing a four-week course with lab normalization and symptom resolution (Table).

Two months later, MRI showed persistent edema in the sacral ala and ilium, though she remained asymptomatic aside from mild exertional discomfort. She developed a febrile illness and recurrent left hip pain. Repeat labs revealed a re-elevated ESR. Given recent imaging and labs, she completed an additional eight-week amoxicillin course for presumed chronic osteomyelitis, with full recovery and resolution on follow-up MRI.

Discussion: This case highlights the rarity of adolescent GBS osteomyelitis involving the sacroiliac joint and presenting with acute urinary incontinence—an association not previously reported. Diagnostic delays arose from under-recognition of abnormal labs and anchoring on incidental spinal MRI findings. Notably, initial imaging excluded the hip, her primary pain site. Osteomyelitis may not initially present with fever, and overuse injuries rarely cause leukocytosis or elevated ESR. In patients with musculoskeletal complaints and bacteremia, osteomyelitis is the most common source and must be ruled out with timely imaging and appropriate source control.

Conclusion: Early recognition, broad differentials, targeted imaging, and avoiding diagnostic bias are vital for optimal outcomes.

No IRB Approval required for the procedure.

Abstract 36

~Khan, M¹, Abdeen, Y¹, Hu, A², Berdia, J², Warrow, D².

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Retrospective database analysis – safety and effectiveness of SB11

Purpose: To evaluate the safety and effectiveness of ranibizumab biosimilar (SB11; Byooviz®) compared to other anti-VEGF agents in real-world clinical practice.

Methods: A retrospective database analysis was conducted across single retina practices in the Mid-Atlantic region, including patients with neovascular age-related macular degeneration (nAMD), central retinal vein occlusion (CRVO), and branch retinal vein occlusion (BRVO) treated with SB11 or other anti-VEGF agents. Data extracted included demographics, diagnosis, treatment initiation, intravitreal injections, best-corrected visual acuity (BCVA), central subfield thickness (CST), and adverse inflammatory events such as intraocular inflammation (IOI) and endophthalmitis.

Results: Among 45,922 intravitreal injections, ranibizumab biosimilar (SB11) accounted for 22,178, with 12 cases of IOI/endophthalmitis (0.00054108). In comparison, faricimab-svoa (n=10,540) and brolucizumab (n=10,112) each had 2 cases (0.00018975 and 0.0001978, respectively). No adverse inflammatory events were observed with aflibercept, bevacizumab, or ranibizumab (Lucentis®). Both IOI cases with SB11 were managed conservatively without intravitreal steroid intervention, and one patient presented with bilateral inflammation. Overall, findings suggest a low incidence of IOI across all agents studied, with SB11 demonstrating a safety profile consistent with other anti-VEGF agents.

Conclusions: Preliminary analysis suggests that ranibizumab biosimilar (SB11) demonstrates a low incidence of IOI comparable to other anti-VEGF agents. However, the study is ongoing, and further analyses including demographic and outcome data are needed before final conclusions can be drawn.

No IRB needed; Cumberland Valley Retina Consultants have an external IRB.

Abstract 37

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Phenotypic Mimicry: Comparative Case Study of HLA-A29 Positive Birdshot Chorioretinopathy vs HLA-A29 Negative Multifocal Choroiditis

Background: White dot syndromes represent a spectrum of inflammatory chorioretinopathies with overlapping features, most often affecting women younger than 50 and presenting with photopsia, floaters, or night blindness [1,2]. Among these, birdshot chorioretinopathy (BSCR) is strongly associated with HLA-A29, particularly HLA-A*29.02, which appears in up to 95% of cases [3,4]. The pathogenesis is thought to involve abnormal antigen processing via ERAP1 and ERAP2, predisposing to autoimmune T-cell activation [5]. Multifocal choroiditis (MFC) is also considered a white dot syndrome but lacks a consistent genetic association, with suspected viral or autoimmune triggers [2,6–8]. Differentiating BSCR from MFC is challenging due to their phenotypic mimicry, with both producing bilateral hypopigmented choroidal lesions, vitreous inflammation, and disc leakage on angiography [2,9].

Case Presentation: We report two patients with overlapping presentations. A 62-year-old HLA-A29 positive female was diagnosed with BSCR and followed over six years. Despite treatment with corticosteroids, methotrexate, biologics, and local steroid implants, she developed progressive visual decline. A 52-year-old HLA-A29 negative female presented after herpes zoster virus reactivation and recent SARS-CoV-2 infection. Initial imaging mimicked BSCR, but genetic testing was negative for HLA-A29. Elevated CRP and ANA positivity supported a diagnosis of MFC.

Discussion: This comparative case highlights the diagnostic challenge of distinguishing BSCR from MFC despite shared clinical features. BSCR's strong HLA-A29 association necessitates long-term immunomodulation [2–4], whereas MFC may emerge following viral infection or autoimmune processes and exhibits variable treatment responses [6–8]. Accurate diagnosis requires integration of genetic testing, systemic workup, and multimodal imaging, ensuring appropriate management and identification of systemic associations [1,2].

Case report, Not needed

Abstract 38

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Integrating Multi-Omic and Clinical Data in KBCommons: CancerKB and the CCMT Tool for Precision Medicine Discovery

The Knowledge Base Commons (KBC) platform (kbcommons.org) is an open-access, community-driven informatics framework designed to accelerate biomedical discovery by mitigating data fragmentation through integrated knowledge bases (KBs). This infrastructure supports the sharing and multi-faceted analysis of structured, multi-omics data across species. A prime example of its application is CancerKB, a human-specific KB within KBC that seamlessly integrates and harmonizes large-scale genomic and clinical data from pivotal resources like The Cancer Genome Atlas (TCGA) and the Cancer Cell Line Encyclopedia (CCLE). CancerKB provides comprehensive data on genes, proteins, miRNAs, 1,046 cancer cell lines, and drug responses, enabling users to explore this information via interactive analytical tools, including a Principal Component Analysis (PCA) visualizer and a clinical data browser.

A key analytical component of the KBC framework is the Cross-species and Comparative Multiomics Translation (CCMT) tool. CCMT provides a powerful web-based environment for comparative genomics, enabling cross-species analysis (e.g., human-mouse) of homologous genes across transcriptomic, proteomic, and other omics data types to identify conserved and divergent molecular mechanisms. Furthermore, it facilitates intra-species comparative analysis and uses the GENIE3 algorithm to reconstruct gene regulatory networks. Together, CancerKB for focused human cancer data and the CCMT tool for cross-species translation create a powerful ecosystem within KBCommons that empowers researchers to generate novel hypotheses, identify potential therapeutic targets, and advance the goals of precision medicine.

None

Abstract 39

~Lu, C¹, Joshi, T².

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scMouseAnnotate: A Transformer-Based Model for Cross-Tissue Cell Type Annotation in Mouse Single-Cell RNA-Seq Data

Accurate cell type annotation is essential for extracting biological insights from mouse single-cell RNA sequencing (scRNA-seq) data, a cornerstone in translational research given the mouse's role as a primary model organism for human biology and disease. We present scMouseAnnotate, a Transformer-based model trained in a unified manner across diverse mouse tissues to enable robust and scalable cross-tissue cell type annotation. Benchmarking against state-of-the-art approaches—including scTab, multilayer perceptron (MLP), XGBoost, and CIFORM—demonstrates that scMouseAnnotate achieves superior performance, with an accuracy of 82.74% and the highest macro and weighted F1 scores. The model's strength lies in its domain-specific Transformer design, which embeds gene bins into high-dimensional representations and captures contextual relationships across gene expression patterns. Unlike existing methods primarily validated on human data, scMouseAnnotate provides a tailored solution for mouse scRNA-seq, offering improved generalization and robustness across heterogeneous tissues. This work highlights the potential of Transformer-based architectures to advance automated annotation in large-scale single-cell studies and to strengthen the translational bridge between mouse and human research.

I have the approval from my advisor: Dr. Trupti Joshi

Abstract 40

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Therapeutic potential of Appalachian Natural Products for cancer and age-related diseases

Lung cancer remains the leading cause of cancer-related mortality worldwide, with West Virginia reporting one of the highest incidence rates in the U.S. (76.5 per 100,000). Despite advances in treatment, conventional chemotherapy offers limited survival benefits, highlighting the need for novel therapeutic agents. The Appalachian region is rich in medicinal plants, many of which are understudied. Investigating their bioactivity may uncover new strategies for cancer treatment and healthy aging. This study evaluates the anticancer and antioxidant properties of crude extracts from ten native Appalachian plants using A549 human lung carcinoma cells. Among the tested plants, Teasel (*Dipsacus laciniatus*) and Lousewort (*Pedicularis lanceolata*) exhibited significant cytotoxicity. Teasel extracts from flower, leaf, stem, and root reduced A549 cell viability by over 50% across multiple solvents (hexane, dichloromethane, ethanol), with notable activity at concentrations as low as 100 µg/mL. Lousewort ethanol extracts from flower, leaf, and stem also showed >50% cytotoxicity at 100–200 µg/mL. Antioxidant assays (DPPH and ABTS) confirmed strong radical scavenging activity (~99%) for ethanol extracts of both plants at 1000 µg/mL (EC₅₀: 100–700 µg/mL). These findings aim to establish the therapeutic potential of Appalachian natural products, particularly Teasel, in lung cancer treatment and contribute to the understanding of their molecular mechanisms.

This study uses human lung carcinoma cells; therefore, IRB or IACUC approval is not required

Abstract 41

*~Bender, C¹, *Valluri, A¹, *Wellman, J¹, *McCallister, CL¹, *Brown, KC¹, *Lawrence, L¹, *Russell, R¹, *Jensen, J¹, *Denvir, J¹, *Salisbury, TB¹.

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Clear Cell Renal Cell Carcinoma upregulates Glycolytic proteins while downregulating OXSPHOS proteins.

Renal clear cell carcinoma (ccRCC) is a malignant tumor that begins in the renal tubular epithelium and spreads into the surrounding tissue. It accounts for 75% of all kidney cancers and has a very poor prognosis, especially when metastasized. Metabolic changes have been reported in ccRCC cells, with the glycolysis form of metabolism being favored over the more efficient oxidative phosphorylation (OXPHOS). Looking at metabolic protein markers related to both Glycolysis and OXPHOS can help determine the effect of these metabolic changes on the proteins associated with ATP production. Tumor samples from patients diagnosed with ccRCC at stages 1-4 of the disease, as well as surrounding peritumor tissue samples of the same patients, were harvested for study and examined. Reverse Phase Protein Array (RPPA) was performed on tissue samples where antibodies were probed onto sample spots and visualized by a DAB colorimetric reaction to produce stained slides. Sample spots were then identified and densities quantified by the Array-Pro Analyzer. Glycolytic pathway proteins, PKM, LDHA, and MCT4, were significantly elevated in ccRCC tumor tissue samples compared to peritumor tissue samples through stages 1-3 of disease. Proteins associated with OXPHOS, including PDHA1, SDHA, COX-IV, and MTCO-1, were all depressed in tumor tissue samples in stages 1-3 relative to nontumor tissue. In summary, tumor samples from ccRCC patients showed a decline in OXPHOS protein expression to increased glycolytic pathway proteins.

IRB :112274

Abstract 42

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Efficacy and Safety of Aldosterone Synthase Inhibitors in Hypertension: A Meta-Analysis of Nine Randomized Controlled Trials

Background: Aldosterone synthase inhibitors (ASIs) are a novel antihypertensive class that directly inhibits aldosterone biosynthesis, potentially improving blood pressure (BP) control, especially in resistant hypertension. We conducted a comprehensive meta-analysis to assess the efficacy and safety of ASIs in adults with hypertension.

Methods: We systematically identified nine randomized controlled trials (RCTs) evaluating ASIs (osilodrostat, vicadrostat, lorundrostat, baxdrostat) compared with placebo. The primary outcomes were changes in systolic BP (SBP) and diastolic BP (DBP). Secondary outcomes included the risk of hyperkalemia and serious adverse events (SAEs). Pooled estimates were calculated using random-effects models.

Results: A total of 2,808 patients (mean age 60 years, 60% male) were included, with treatment durations ranging from 5 to 29 weeks. ASIs significantly reduced SBP by -9.7 mmHg (95% CI: -11.0 to -8.5 ; $P < 0.0001$) and DBP by -3.4 mmHg (95% CI: -4.4 to -2.4 ; $P < 0.0001$) compared with placebo. The risk of hyperkalemia was increased (RR 2.6; 95% CI: 1.4–4.8; $P = 0.002$), while the risk of SAEs was not significantly different (RR 1.1; 95% CI: 0.7–1.7; $P = 0.6$). The greatest BP reductions were observed in resistant hypertension populations, particularly with lorundrostat.

Conclusions: ASIs provide clinically meaningful BP reductions, including in resistant hypertension, with an acceptable safety profile aside from a moderate increase in hyperkalemia risk. These findings highlight the promise of ASIs as a novel therapeutic class and support their further evaluation in large-scale cardiovascular outcome trials.

IRB approval, it was not obtained for this study as they are meta-analyses. The research does not include direct interaction with human subjects or access to any identifiable private information. All data used for the analysis was sourced solely from publicly available and previously published materials.

Abstract 43

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The Role of Colchicine in Coronary Heart Disease: An Umbrella Review of Meta-Analyses

Introduction: Colchicine, a well-established anti-inflammatory agent, has recently gained attention for its potential cardiovascular benefits, particularly in the management of coronary heart disease (CHD). Several meta-analyses have evaluated its efficacy in reducing adverse cardiovascular outcomes. However, a comprehensive synthesis of this evidence is lacking. This umbrella review aims to consolidate and critically appraise findings from existing meta-analyses to better understand the role of colchicine in CHD management.

Method: In accordance with the PRIOR guidelines, PubMed, Google Scholar, Web of Science, and Scopus were searched from databases inception to May 2024 to identify relevant articles. The outcomes of interest included the association between colchicine and the incidence of major adverse cardiovascular events (MACE) and cardiovascular mortality. Effect size estimates for these outcomes were compared across studies, and a corrected covered area (CCA) assessment was performed to determine overlap. The quality and methodological rigor of each included review were evaluated using the AMSTAR-2 tool.

Results: From 13,233 articles identified, 14 meta-analyses were included, showing a significant overlap with a corrected covered area of 30.8%. Multiple studies consistently demonstrated colchicine's protective effect on major adverse cardiovascular events (MACE) in coronary heart disease (CHD), with relative risks (RR) ranging from 0.44 to 0.75 (Xu et al., 2022; Verma et al., 2015; Aw et al., 2022; Fiolet et al., 2021; Younas et al., 2025; Casula et al., 2022) and odds ratios (OR) between 0.67 and 0.78 (Jaiswal et al., 2025; Shaikh et al., 2025; Akl et al., 2024; Chunfeng et al., 2021; Fu et al., 2021). Samuel et al. (2021) reported a hazard ratio (HR) of 0.68. However, colchicine's effect on cardiovascular death was not significant in most reviews, with RRs near unity (Xu et al., 2022; Fiolet et al., 2021; Bao et al., 2022) and ORs ranging from 0.78 to 1.17 (Jaiswal et al., 2025; Shaikh et al., 2025; Kofler et al., 2021; Chunfeng et al., 2021; Fu et al., 2021), indicating no clear mortality benefit.

Conclusion: Colchicine significantly reduces the risk of major adverse cardiovascular events (MACE) in patients with coronary heart disease. However, current evidence does not support a clear Benefit in reducing CVS mortality

Regarding IRB approval, it was not obtained for this study as they are meta-analyses. The research does not include direct interaction with human subjects or access to any identifiable private information. All data used for the analysis was sourced solely from publicly available and previously published materials.

Abstract 44

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Selective Bcl-2 mRNA Inhibition by Trans-acting DNAzymes: a Novel Cancer Therapeutic

Contemporary oncologic treatment development is increasingly shifting towards intentional design of targeted therapies which modulate molecular pathways necessary for tumorigenesis and expansion. An important potential target is the anti-apoptotic protein Bcl-2, a key regulator of the intrinsic apoptosis pathway commonly overexpressed in malignancies such as B-cell lymphomas and chronic lymphocytic leukemia. While small-molecule inhibitors have been developed, the efficacy of nucleic acid therapies against Bcl-2 is not well-characterized. In this study, we developed novel, trans-acting deoxyribozymes (DNAzymes) possessing endonucleolytic cleavage ability of target Bcl-2 mRNA. Our DNAzymes significantly downregulated Bcl-2 expression and reduced cell viability through induction of caspase-dependent apoptosis in HepG2 and MCF-7 cancer cell models. In a 4T1 murine mammary carcinoma model, treatment with DNAzymes significantly reduced tumor size and Bcl-2 mRNA and protein expression, without an associated reduction in body weight. In vivo, their efficacy was comparable to treatment with 5-fluorouracil (5-FU). This proof-of-concept study highlights the potential of DNAzymes to serve as powerful, highly specific therapies against oncoproteins such as Bcl-2.

IRB approval for this study was obtained by the Northeast Technical Institute of Pharmaceutical Sciences (NETES) Registration no (1996/PO/RC/S/17/CPCSEA)

Abstract 45

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Trends and disparities in premature mortality from hematologic malignancies: Analysis of CDC wonder data, 1999-2020

Background: Premature mortality from hematologic malignancies is a major source of life-years lost, yet national trends and disparities are not well characterized. Although advances in therapy have improved outcomes, it is unclear whether these gains have extended uniformly to younger populations.

Methods: We analyzed CDC WONDER mortality data from 1999–2020 for individuals under 55 years with hematologic malignancy as the underlying cause of death (ICD-10 C81–C96). Age-adjusted mortality rates (AAMR) per 100,000 person-years were calculated by race/ethnicity, sex, urbanization, and census region. Joinpoint regression estimated Annual Percent Change (APC), and subgroup differences were evaluated using linear models with Year × Group interactions.

Results: AAMR declined from 3.7 in 1999 to 1.9 in 2020 (APC -2.95%, $p < 0.001$). All groups showed significant reductions, though magnitudes varied. The Midwest had the steepest declines (APC -3.90% in 1999–2005; -4.73% in 2015–2020), while the South declined least (APC -2.71%). The Northeast demonstrated a steady decline (APC -3.44%). By race, non-Hispanic Black individuals had the highest mortality (4.7→2.7; APC -2.66%), Asian/Pacific Islanders the lowest (2.4→1.1; APC -3.05%), and non-Hispanic Whites the largest absolute decrease (APC -3.22%). Mortality remained higher among males than females (2020: 2.3 vs 1.6), though declines were similar. Urban areas experienced greater reductions than rural (APC -3.11% vs -2.70%).

Conclusion: Premature mortality from hematologic malignancies declined markedly between 1999 and 2020. Persistent disparities by race, geography, and urbanization, particularly among non-Hispanic Black individuals and those in rural and Southern regions, underscore inequities in access to curative therapies.

IRB approval was not required because the study used publicly available, de-identified data.

Abstract 46

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Surviving the Storm: Electrical Storm in a Pediatric Patient with Brugada Syndrome

Brugada Syndrome (BrS) is a rare autosomal dominant arrhythmogenic disorder with an estimated prevalence of 3–5 per 10,000 individuals. It is characterized by coved ST-segment elevation in the right precordial leads, which is diagnostic by Shanghai Scoring Criteria. Mutations in SCN5A, encoding the cardiac sodium channel α -subunit, account for 20–30% of cases. Channel dysfunction reduces sodium current and enhances transient outward potassium current, predisposing to phase two reentry and malignant ventricular arrhythmias.

A 15-year-old male presented with syncope, initially suspected to be a seizure. In the Emergency Department, he developed polymorphic ventricular tachycardia degenerating into ventricular fibrillation, requiring CPR and defibrillation. Post-resuscitation ECG demonstrated a Brugada pattern. He was admitted to the pediatric ICU, intubated, and stabilized on low-dose epinephrine. On hospital day three, he experienced recurrent polymorphic ventricular tachycardia triggered by late-coupled PVCs. Both episodes required defibrillation with return of spontaneous circulation. He was treated with isoproterenol and transitioned from short- to long-acting quinidine. Echocardiography and cardiac MRI excluded myocarditis and anomalous coronary origins. An ICD with pacing capability was placed due to arrhythmia recurrence and quinidine-associated bradycardia. Genetic testing revealed three variants of uncertain significance, including SCN5A c.841G>A (p.Val281Met).

This case demonstrates a life-threatening BrS presentation in a pediatric patient with an SCN5A variant currently classified as of uncertain significance. Given the strong correlation with clinical phenotype and prior reports linking this variant to BrS and dilated cardiomyopathy, reclassification by the American College of Medical Genetics and Genomics as a pathogenic variant may be warranted.

N/A

Abstract 47

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Thymidine Phosphorylase Deficiency Does not Affect Vascular Density in Mice Under Both Physiological and Pathological Conditions

Thymidine phosphorylase (TYMP), also known as platelet-derived endothelial cell growth factor, is significantly elevated in certain tumors and correlates with cancer-associated angiogenesis. TYMP levels are also increased in some pathological conditions, such as diabetes. Work from Dr. Wei Li's laboratory has shown that global TYMP deficiency significantly inhibits clot formation in mice, suggesting that targeting TYMP could be a novel therapeutic strategy for thrombotic diseases. However, whether TYMP inhibition affects vascular development and angiogenesis remains unclear. Since *Tymp*^{-/-} mice are fertile and have no obvious development defects, we hypothesized that TYMP is not essential for vessel development and angiogenesis. To test this hypothesis, we examined vessel density in the hearts of WT and *Tymp*^{-/-} mice under physiological conditions or following acute myocardial infarction for 4 weeks. In addition, we assessed retina vessel density in mice fed a high-fat diet (HFD) for 16 weeks, compared between WT and *Tymp*^{-/-} mice, as well as age-matched mice fed normal chow, using IB4 staining. In normal myocardium, the density of CD31 positive vessels was the same between WT and *Tymp*^{-/-} hearts. The vascular density was dramatically reduced due to myocardial infarction in both strains, but no difference was observed between WT and *Tymp*^{-/-} mice. Compared to normal chow, HFD-feeding did not significantly alter retinal vascular density, and TYMP deficiency did not affect vascular density in either dietary group. Our findings demonstrate that TYMP is not essential for vascular development or angiogenesis. Thus, targeting TYMP could be a safe strategy for other disease conditions.

IACUC: 1033528

Abstract 48

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Decoding Gut-Brain Communication: Alcohol-Induced Microbial Stress via Biphasic Exposure in Male Sprague Dawley Rats

According to 2024 data from the U.S. Centers for Disease Control and Prevention (CDC), 17% of adults in the United States engage in binge drinking. Alcohol is known to disrupt the gut barrier, causing pro-inflammatory signal release that affects both the peripheral immune system and brain. Gut-derived metabolites and inflammatory signals cross the blood-brain barrier, prompting neurotoxicity. This study delineates the longitudinal impact of alcohol exposure on the gut-brain axis using four cohorts of male Sprague Dawley rats. Cohorts transitioned from an adolescent binge phase (PND 30-71) to a limited access two-bottle choice paradigm (PND 72-366), generating six exposure groups.

Bacterial DNA was extracted from fecal samples. 16S rRNA amplicon sequencing with V3-V4 primers was performed using Illumina NextSeq 2000, with libraries sequenced in a 150 bp paired-end run. Raw reads were processed with DADA2 through the NIAID Nephele platform, identifying microbial taxa. PICRUSt2 predicted abundances of genes, enzymes, and metabolites. R packages “phyloseq,” “DESeq2,” and “ggpicrust2” enabled data visualization.

Preliminary findings indicated that beneficial butyrate-producing bacteria lessened during binge drinking as did propionate-producing bacteria during a choice-based paradigm. EtOH-tolerant bacteria increased during binge drinking, with an age-dependent increase in *Helicobacter* suggesting a pro-inflammatory state. Stress-response genes have since been found across weeks, notably *RsbU* and *RsbV*. Alcohol, a stressor, was oxidized into aldehydes and acetate, activated by acetyl-CoA synthetase to form acetyl-CoA, a butyrate precursor. Enzymes were contributors to a pro-inflammatory state, the EptC enzyme synthesizing lipopolysaccharide and a virulence-associated IgA-cleaving protease. Amino acid breakdown (e.g., tryptophan) was prevalent.

VA IACUC #1782280

Abstract 49

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Cytisine: A partial nicotinic receptor agonist and its potential in nicotinic cessation in a vapor formulation

Tobacco dependence remains the number one cause of preventable death. This is due to nicotine-containing products contributing to 90% of the incidents of lung cancer. Currently, nicotine cessation products are limited in their efficacy and long-term success rates. Cytisine, a partial agonist for nicotinic acetylcholine receptors, has seen a marginal level of success in the European smoking cessation market and is currently being evaluated in America. However, the multiple daily dose oral regimen has exhibited problems with patient compliance. Here, we use a preclinical model of vaping-relevant self-administration to evaluate the efficacy of vaped cytisine on nicotine reinforcement. We observed that vaped cytisine produces high brain penetration, attenuates nicotine self-administration, and attenuates nicotine-triggered dopamine release in the nucleus accumbens core.

N/A - Basic Science Research

Abstract 50

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MS Healthcare Providers Are Not the Leading Online Resource, Analysis of the MS Online Sources, Searches, and Sites

Research demonstrates that people living with multiple sclerosis (MS) often use the internet for health education, yet the sources of online information are unclear.

This study aimed to (1) identify and compare the top 5 sources for common MS-related search terms across six online platforms, (2) compare sources between platforms, and (3) assess whether account type alters results.

Three medical students searched Twitter, Instagram, YouTube, TikTok, Facebook, and Google using both personal and new accounts. Nine MS-related search terms were entered, and the top 5 results per platform were coded as personal (P), patient advocate (PA), physician (MD), other healthcare provider (OHP), academic (A), or unknown (U). In total, 540 data points were analyzed using chi-square tests.

Source type was significantly associated with platform ($p < 0.001$). Personal accounts were most common overall ($n=248$), followed by patient advocates ($n=100$) and academics ($n=86$). Platform-specific trends included P (Twitter, Facebook, Instagram, TikTok), A (Google), and MD (YouTube). Overall, 34.4% of results came from healthcare sources (MD, A, OHP), with YouTube containing the highest proportion (53.3%). Account type did not significantly affect results ($p=0.52$).

In conclusion, MS-related online information most often originates from personal and advocacy accounts, while healthcare and academic sources are less visible. Academics dominated only on Google, and physicians were the leading source only on YouTube. These findings highlight the limited visibility of healthcare providers online and suggest an opportunity for clinicians to expand their presence to improve patient access to reliable MS information.

All data obtained was public, therefore the IRB was not involved in this study.

Abstract 51

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From concept to practice: evaluating the effectiveness of a sharepoint roadmap for medical student success

The recipe for success in medical school is constantly evolving, yet this information often remains decentralized. To address this, the Learning Community Leaders (LCLs) at MUSOM created a Microsoft SharePoint-based roadmap as a centralized hub for key resources, advice, and guidance. While this tool was created to benefit students, the LCLs have never evaluated if the SharePoint is providing the intended guidance and helping students succeed in tangible ways.

A 9-question survey assessing usefulness, accessibility, and frequency of use was distributed to the classes of 2027 and 2028 (n=144). Our target was 72 responses; 71 were received.

Most students reported accessing the SharePoint at least once per block and described it as user-friendly, supporting its role as an accessible and practical resource. Students indicated plans for continued use, highlighting sustained utility. The preclinical curriculum roadmap and third-party resource/textbook-specific question banks were the most frequently accessed sections, underscoring the importance of tools that streamline curricular navigation and exam preparation. Feedback also revealed that some content was not consistently updated, representing a key limitation.

The MUSOM SharePoint roadmap is a widely used and well-received platform that provides practical support for students. Its greatest strengths are curricular organization and exam resource guidance. Routine upkeep will be essential to maintain accuracy and maximize long-term benefit for future classes.

No IRB required.

Abstract 52

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Nutritional Strategies Against Dementia in Rural Populations: A Literature Review

Intro: Dementia has been diagnosed in over 55 million people as of 2024. Studies have shown that those in rural populations are more likely to be underdiagnosed, diagnosed at advanced stages, and experience higher mortality from dementia-related causes. This review summarizes dietary modifications that have been shown to prevent dementia risk, as well as the barriers those living in rural areas face when attempting to implement these modifications.

Methods: A literature search was conducted in PubMed using combinations of keywords including “gut,” “rural,” “Alzheimer’s,” “dementia,” “rural health,” “vitamins,” and “phytochemicals.” A total of 229 peer-reviewed articles were included for synthesis.

Results: First, limited access to nutrient-rich diets and higher prevalence of vitamin deficiencies were linked to worse cognitive outcomes. Additionally, alterations in gut microbiota composition were associated with increased neuroinflammation and accelerated neurodegeneration. Nutritional based interventions (e.g. phytochemicals, vitamins, diets) demonstrated promise in modulating the gut–brain axis via inflammatory cascades and miRNA signaling. However, rural populations consistently faced barriers in availability to these sources. Healthcare access constraints in rural settings—such as fewer specialists and delayed diagnosis—compounded the biological risk factors.

Conclusions: This paper outlined how nutritional deficits and rural health disparities contribute to cognitive decline, while reviewing evidence for nutraceuticals with neuroprotective potential. Future research should prioritize clinical trials in rural populations and evaluate combined nutraceutical strategies. Addressing barriers to rural implementation and focusing on community health initiatives can facilitate integration into public health policy, ultimately holding promise for reducing dementia risk and advancing personalized medicine.

N/A- Literature Review none needed

Abstract 53

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Late-Onset Li-Fraumeni Syndrome-Like Phenotype Presenting with Synchronous Lung Adenocarcinoma and Ovarian High-Grade Serous Carcinoma: A Case Report

Background: Li-Fraumeni syndrome (LFS) is a rare hereditary cancer syndrome predominantly linked to germline TP53 mutations and typically early-onset cancers. However, the phenotypic spectrum of LFS continues to expand, including later-onset and atypical tumor presentations that mirror Li-Fraumeni-like (LFL) syndromes.

Case Presentation: A 53-year-old woman was diagnosed with stage IIIC high-grade serous ovarian carcinoma and synchronous lung adenocarcinoma, both harboring the TP53 mutation. She underwent comprehensive surgical debulking and standard chemotherapy, achieving a favorable response. Germline analysis for over 70 cancer susceptibility genes—including TP53—was negative, ruling out a constitutional TP53 pathogenic variant. These findings, together with genomic loss of heterozygosity and the nature of the TP53 mutation (affecting the p53 tetramerization domain), pointed to possible mosaic somatic or therapy-induced somatic origin. The patient's clinical course exemplifies a late-onset, LFS-like phenotype.

Discussion: This case highlights diagnostic complexity in TP53-driven multiple primary cancers with negative germline findings. The relatively rare TP53 mutation outside the hotspot DNA-binding domain may contribute to lower penetrance and delayed onset. Literature underscores the need to consider mosaic or therapy-related TP53 mutations in such presentations, particularly as increased sensitivity of genetic testing reveals these subtleties. Comprehensive genetic evaluation and ancillary testing are essential to avoid misclassification and to guide surveillance and management.

Conclusion: Recognition of mosaic and somatic TP53 mutations refines diagnosis and management for atypical or late-onset cases. Multidisciplinary genetic assessment should be prioritized in older patients with multiple TP53-mutant tumors.

N/A- This is a case report.

Abstract 54

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Unexpected Persistence of Extended-Release Buprenorphine in Pregnancy and Neonatal Outcomes at Delivery

Background: Extended-release buprenorphine (BUP-XR) is increasingly used in pregnancy for opioid use disorder. Therapeutic levels are expected to persist for 2-5 months, but clinical experience suggests detectability may extend much longer. Data describing real-world persistence and neonatal outcomes are limited.

Methods: We retrospectively reviewed pregnant patients with a history of BUP-XR use and positive buprenorphine urine drug screens (UDS) at delivery. Extracted data included maternal comorbidities, medications, substance use, timing of last BUP-XR dose, quantitative buprenorphine (bup) and nor-buprenorphine (nor-bup) concentrations, and neonatal pharmacologic treatment for NAS. The nor-bup:bup ratio was calculated as a marker of metabolism, with lower values suggesting reduced conversion of bup to its primary metabolite.

Results: Nine mother-infant dyads with prior BUP-XR exposure were identified.

- Persistence: Buprenorphine remained detectable 8-14 months after the last BUP-XR injection in several cases.

- Concentrations: Maternal bup ranged from 12-126 ng/mL, nor-bup from 16-149 ng/mL. Nor-bup:bup ratios varied from 1.2-3.3. Cannabis-exposed mothers showed consistently lower ratios (~1.2-1.3) compared with non-cannabis cases (>3.0).

- Neonatal outcomes: 7 of 9 neonates required pharmacologic treatment, with duration ranging from 1-11 days.

Conclusions: BUP-XR demonstrates unexpectedly prolonged detectability in pregnancy, persisting up to 14 months after the final injection. Although most neonates required treatment for NAS, this small cohort cannot determine whether exposure worsens outcomes. Cannabis use was associated with altered maternal metabolism (lower nor-bup:bup ratios), suggesting a possible interaction that warrants further study.

2264518

Abstract 55

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Rural Pediatric Wellness Initiative: Understanding the Knowledge Gap of Health Literacy

Rural West Virginia faces significant socioeconomic and health challenges, including high rates of obesity and cardiovascular disease. Improving pediatric health literacy is critical for fostering healthier behaviors and reducing these risks. The Rural Pediatric Wellness Initiative delivered nutrition-focused lessons to elementary students in Logan and Lincoln counties (WV) during summer enrichment programs.

This observational cohort study spanned two five-week sessions and assessed children's understanding of healthy habits, including diet, sleep, hygiene, and exercise. Food group recognition was measured by asking participants (n = 26) to list up to two examples from each category. Data analysis used paired t-tests, Chi-square, and Fisher's Exact testing, with significance at $p < 0.05$. IRB approval and informed consent/assent were obtained.

At baseline, correct identification was 65.4% for dairy, 98.1% for fruit, 78.9% for vegetables, 90.4% for protein, and 44.2% for grains. After the intervention, recognition increased to 73.1%, 100%, 88.5%, 96.2%, and 63.4%, respectively. Grain identification improved significantly ($p < 0.001$), while other food groups showed non-significant gains. Pairwise comparisons highlighted persistent disparities: dairy was identified less often than fruit ($p = 0.001$) and protein ($p = 0.02$), while grain recognition lagged behind fruit ($p = 0.002$), vegetables ($p = 0.048$), and protein ($p = 0.005$).

In summary, elementary students in rural Appalachia demonstrated notable nutrition literacy gaps that were partially improved through targeted intervention. While overall recognition increased, dairy and grain remained areas of weakness. Addressing these gaps may support stronger healthy habits and reduce long-term health risks in this vulnerable population.

2199540-5

Abstract 56

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ASA Class Predicts Intraoperative Hypotension Duration in Primary Knee Arthroplasty

Background:

During total knee arthroplasty (TKA) patients can experience a drop in mean arterial pressure (MAP), known as intraoperative hypotension (IOH). When MAP < 65 mmHg, adverse renal and cardiovascular events have been shown to occur, with increased duration also linked to increased risk. We hypothesized that pre-operative demographic characteristics may be a predictor of IOH in TKA.

Methods: A retrospective cohort of 896 primary TKA patients at a single academic institution between 2020 and 2025 were assessed. Multivariable linear regression assessed predictors of increased IOH duration, incorporating sex, age, body mass index (BMI), regional or general anesthesia, hypertension, diabetes, and American Society of Anesthesiologists (ASA) class. A zero inflated negative binomial model was also performed on the cohort, as most patients did not experience any hypotension.

Results: Patients had a mean age of 65.3 years, a mean BMI of 35.0, and the mean time MAP < 65 mmHg was 8.8 minutes. The cohort mainly consisted of patients who were ASA class 3 (79.9%), followed by class 2 (16.9%), class 4 (2.8%), and class 1 (0.4%), with 86.8% of patients undergoing regional anesthesia. There were significant differences in the number of patients experiencing IOH between ASA classes ($p = 0.047$). Linear regression analysis showed ASA class was significantly associated with increased IOH duration ($\beta = +3.60$ minutes per class, SE: 1.51, $P = 0.017$). In the zero inflated negative binomial model, ASA class demonstrated the strongest trend on duration of IOH (IRR= 1.23, 95% CI: .99-1.52, $p = 0.058$).

Conclusion:

In our study, ASA class has been shown to be associated with duration of IOH during TKA. Based on our linear regression, with each elevation in class 3.6 more minutes of hypotension may be observed. These findings may allow surgeons to better mitigate risk of cardiac or renal complications through improved preoperative planning and more robust hemodynamic monitoring while the patient is under anesthesia during TKA.

2313070-2

Abstract 57

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Adjunctive Mirtazapine in Treatment-Resistant Schizoaffective Disorder: A Case Report

Intro: Schizoaffective disorder can present significant treatment challenges, with roughly 20-30% of patients experiencing treatment resistant symptoms. Randomized control trials and systemic reviews have suggested that adjunctive mirtazapine- an alpha 2 adrenergic receptor, 5-HT₂ and 5-HT₃ receptor antagonist- may help improve negative and cognitive symptoms in patients with schizophrenia. This case report details the case of a 37-year-old female with a 10-year history of refractory schizoaffective disorder who experienced significant clinical improvement after adding mirtazapine to her current treatment regimen.

Case Report: A 37-year-old female with schizoaffective disorder was readmitted to an inpatient psychiatric facility following multiple failed treatment attempts and persistent psychiatric symptoms. Since her initial diagnosis, she had experienced over 20 psychiatric hospitalizations and/or involuntary commitments, primarily due to recurrent psychosis and medication non-adherence. Prior treatment trials included clozapine and long-acting injectable (LAI) antipsychotics such as aripiprazole and paliperidone, without meaningful clinical improvement. At the time of this admission, the patient was noncompliant with medications and was restarted on clozapine 100 mg daily and paliperidone LAI 234 mg. However, her psychiatric symptoms remained largely unchanged. Mirtazapine was subsequently introduced and titrated to 30 mg daily over one month. Within one month, the patient demonstrated significant clinical improvement, with her PANSS score decreasing from 89 (moderately ill) to 71 (mildly ill).

Conclusion : This case highlights the potential role of mirtazapine as an adjunctive therapy for patients experiencing treatment resistant symptoms of this disorder. The addition of mirtazapine may contribute to significant symptom improvement and enhance quality of life. Future research may be warranted to further investigate the effectiveness of mirtazapine in the treatment of schizoaffective disorder.

None required

Abstract 58

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Leg-Length Discrepancy, Pelvic Obliquity, and Secondary Scoliosis: A Literature Review of Current Evidence and Knowledge Gaps

Background: Secondary scoliosis may arise from biomechanical imbalances, particularly leg-length discrepancy (LLD) and pelvic obliquity (PO). While congenital and acquired causes of LLD are well described in children, the extent to which LLD and PO contribute to secondary scoliosis in adults remains unclear.

Objective: To evaluate current literature on LLD, PO, and secondary scoliosis across pediatric and adult populations.

Methods: A targeted review of PubMed and Scopus (2005–2025) identified six retrospective studies and two narrative reviews on LLD/PO-related scoliosis. Extracted data included LLD magnitude, Cobb angle, pelvic tilt, vertebral rotation, interventions, and outcomes.

Results: LLD exceeding 5–10 mm was consistently associated with pelvic tilt, vertebral rotation, and compensatory spinal curvature. In pediatric patients, early detection and correction of LLD led to curve regression or stabilization in up to 84% of cases, highlighting the importance of intervention during growth. In adults, PO, rather than LLD alone, was more predictive of coronal malalignment and postoperative complications, suggesting lifelong biomechanical adaptation. Across studies, orthotic and surgical correction improved alignment, though long-term outcomes remain poorly defined.

Conclusion: LLD and PO are significant contributors to secondary scoliosis. Early correction in children prevents progression, whereas adult management should prioritize PO. However, heterogeneity in measurement techniques and limited long-term data underscore the need for standardized protocols, large-scale studies, and outcome tracking beyond five years.

Keywords: Secondary scoliosis, leg-length discrepancy, pelvic obliquity, coronal malalignment.

None required

Abstract 59

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Modeling and identifying binding sites of the olfactory receptors in *Rhagoletis pomonella*

The olfactory system in insects can facilitate many behaviors such as mating and feeding. Through understanding sensory processing mechanisms of pest insects, we can develop effective control strategies and safe repellents. To investigate the docking between odor molecules in the environment and receptors, we modeled certain olfactory receptors (OR) of the fruit fly and major apple pest, *Rhagoletis pomonella* using AlphaFold 3. Ramachandran plots were created for the completed models using SAVES v6.1 to assess the quality of the structure. Afterwards, Autodock vina was used to perform docking studies to predict binding pockets, calculate binding energy, and identify bonds between known the OR and putative ligands. Docking was also performed in iORbase, an online database designed to facilitate sharing of insect OR models as well as investigations of novel insect olfactory receptors. We compared all of our results between Autodock vina and iORbase. *R. pomonella* OR13a was chosen to be modeled due to its high response to 1-octen-3-ol in the homologous receptor in *Drosophila melanogaster*, as well as other flies more closely related to *Rhagoletis* like the mango fly *Bactrocera dorsalis*. Although the docking of other molecules that the OR13A strongly responds to, such as 2-heptanol, matches between *R. pomonella* and other species, 1-octen-3-ol does not share the same binding pocket in the OR13a of *R. pomonella* when modeled with Autodock vina or iORbase. This suggests a specific change in *Rhagoletis pomonella* in this olfactory receptor, and that there is likely another receptor other than OR13a in that responds to 1-octen-3-ol.

None

Abstract 60

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Assessing the long-term effects of prenatal opioid exposure on astrocyte morphological development in mouse prefrontal cortex

Prenatal opioid exposure (POE) has increased markedly in recent years, leading to a corresponding rise in neonatal opioid withdrawal syndrome (NOWS): a constellation of physiological symptoms that present when the newborn is abruptly weaned from the opioids in the maternal blood supply. Although opioid exposure is associated with neurological deficits, its specific impact on the developing brain remains incompletely understood. Synaptogenesis is a critical component of brain development, relying on the coordinated activity of neurons and astrocytes within the tripartite synapse, which consists of the presynaptic neuron, postsynaptic neuron, and peripheral astrocyte process (PAP). While neuronal contributions have been studied extensively, the roles of astrocytes in early brain development have traditionally been less well-defined. Astrocytes are now recognized as complex glial cells that actively regulate synapse formation and maturation, in part through secretion of factors such as thrombospondins (TSPs) and hevin, which promote cortical synaptogenesis. In this study, we investigated how POE alters astrocyte growth, morphology, and physical interactions with excitatory synapses in the developing cortex. Using a mouse model in which pregnant females are exposed to the commonly prescribed opioid buprenorphine, we used viral labeling methods, immunohistochemistry, and confocal microscopy to assess astrocyte structural properties in various frontal cortical subregions, with significant differences emerging in the brains of opioid-exposed adolescent offspring compared to vehicle controls. Ultimately, understanding how opioids disrupt astrocyte function may uncover novel mechanisms underlying neurodevelopmental vulnerability and guide strategies to mitigate cognitive and behavioral deficits in affected children.

IACUC 697

Abstract 61

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Linking Substance Use Identification to Preventive Health Interventions: A Quality Improvement Approach

Background: Hospitalized patients frequently undergo drug screening, but these results rarely trigger follow-up for high-risk infections such as HIV, hepatitis B, hepatitis C, and syphilis. Guidelines recommend screening adults at increased risk, yet many never receive testing in outpatient settings, representing missed opportunities for early diagnosis and treatment. This contributes to preventable morbidity, delayed linkage to care, and increased long-term costs.

Objective: This quality improvement project evaluates follow-up practices for patients with inpatient drug screens and implements a system to ensure high-risk individuals are flagged for infectious disease screening after discharge. The goal is to improve early detection, linkage to care, and disease burden reduction.

Methods: We will conduct a prospective initiative at Marshall Health. First, we will retrospectively review records of patients who underwent inpatient drug screening in the past 12 months, assessing how many subsequently received HIV, hepatitis B, hepatitis C, or syphilis testing. Next, we will design an automated electronic health record (EHR) alert notifying primary care providers when a patient has a positive drug screen but no record of infectious disease testing. The alert will recommend screening at the next encounter, in alignment with CDC and USPSTF guidelines.

Anticipated Outcomes: We expect to identify substantial gaps in post-discharge screening. Implementation of the EHR alert should increase the proportion of at-risk patients who receive recommended testing, improving early diagnosis and care continuity.

Significance: This project embeds a low-burden, scalable intervention into the discharge pathway, maximizing the value of inpatient data and preventing missed opportunities for infection prevention.

No IRB submitted, QI project with goals of turning into possible clinical research. Pilot project.

Abstract 62

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The effect of two-week adolescent social isolation on the medial prefrontal cortex and nucleus accumbens function: a pilot study

There is an interdependent relationship between mood disorder symptoms and nicotine use especially amongst adolescents. This could be in part due to the delayed development of the prefrontal cortex (PFC), yet to establish regulatory control over limbic areas like the nucleus accumbens (NAc). Preclinical studies are currently limited in how chronic stress during adolescence impacts concurrent nicotine use. Social isolation (SI) stress is an easy, efficient and clinically translatable model of chronic stress. In this study, we investigated the impact of a two-week isolation period starting at post-natal day (PND) 21 in male and female C57BL/6J mice. After the isolation period they were sacrificed, and brains were extracted. The medial PFC and NAc were isolated for electrophysiology and fast scan cyclic voltammetry (FSCV), respectively. We measured activity of layer 5 pyramidal cells in the prelimbic prefrontal cortex and found in males an increase in excitability and in females a decrease in excitability. FSCV measurements in the NAc revealed that both tonic and phasic release of dopamine was increased in both sexes. These preliminary findings highlight the importance of exploring sex-dependent responses to stress during adolescence and elucidates a potential pathway involved in the behavioral differences in nicotine intake.

Abstract 63

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Is Written Communication from Pharmacy Benefit Managers to Primary Care Physicians Helpful? A Review of Seven Physicians' Practices

Pharmacy benefit managers (PBMs) manage formulary prescriptions, utilization reviews, and medication therapy management. When PBMs identify issues, they send communications to primary care providers, generating excessive paperwork and contributing to burnout. This study investigated the frequency of PBM communications and interventions made by seven physicians. We hypothesized that the number of helpful communications would be small. We collected six months of mailed communications from PBMs to seven internal medicine physicians. We analyzed the communications and sorted them by the number of communications sent to each physician, specific PBM, communication category, if an intervention was made, and repeated communications. We received a total of 389 communications, with 32 (8%) resulting in interventions. Physicians received between 4% and 21% of their total patient panel in communications. Out of physicians that made interventions, the lowest number of interventions was 2% (1/58) and the highest number of interventions was 74% (17/23) ($p < 0.001$). Two physicians did not make interventions. Medication recall resulted in the highest percentage of interventions (5/6, 84%) but there was no significant difference compared to other types of communications ($P = 0.26$). Fifty-seven (15%) communications were repeated. Communication and intervention frequency varied widely among physicians with one-third of physicians either seeing all communications as not helpful or ignoring the communications completely. Communication category did not impact the likelihood of a physician making an intervention. In summary, different communications from PBMs are helpful to different physicians, but overall, communications were not seen as helpful to the physicians.

2211699

Abstract 64

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Mechanical Thrombectomy for Pulmonary Embolism: A Single-Center Retrospective Analysis

Background: Pulmonary embolism (PE) carries high morbidity and mortality. Systemic thrombolysis is limited by bleeding risk. Percutaneous mechanical thrombectomy (PMT) offers rapid clot removal without thrombolytic exposure, particularly in intermediate- and high-risk PE patients ineligible for systemic therapy.

Methods: We retrospectively analyzed patients undergoing PMT for acute PE between January–December 2024. The primary outcome was 30-day all-cause mortality; secondary outcomes included major bleeding, vascular injury, and pulmonary artery pressure (PAP) changes. Technical success, hemodynamics, and oxygen requirements were also assessed.

Results: A total of 24 patients underwent PMT. The cohort was predominantly male (70.8%) with a mean age of 61 ± 14 years and a mean BMI of 36.4 ± 11.6 kg/m². Concurrent deep vein thrombosis was identified in 62.5% of patients. The mean procedural time was 85.9 ± 30 minutes. Two patients received adjunctive thrombolytic therapy. Technical success was achieved in 23 patients (95.8%). PE-related mortality occurred in one patient (4.2%). The need for supplemental oxygen decreased from 62.5% pre-procedure to 45.8% post-procedure. Significant reductions were observed in pulmonary artery pressures post-thrombectomy: systolic PAP decreased by 12.5 ± 7.6 mmHg ($P \leq 0.001$), diastolic PAP by 5.9 ± 5.5 mmHg ($P \leq 0.001$), and mean PAP by 10.3 ± 13.4 mmHg ($P = 0.001$).

Conclusion: In this single-center cohort, PMT achieved high technical success, reduced pulmonary pressures, and decreased oxygen requirements, with low complication rates. These results support PMT as a safe and effective alternative to systemic thrombolysis in selected patients with acute PE.

None required

Abstract 65

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Zero-nicotine vanilla-flavored vape products alter dopamine neurons in the ventral tegmental area

Electronic nicotine delivery systems (ENDSs) are unique from combustible cigarettes due to the availability of flavor options, which make these devices more attractive. Prior preclinical investigations have determined that menthol and green apple flavorants can enhance nicotine reward and reinforcement by altering dopamine transmission via nicotinic acetylcholine receptor (nAChR) modulation in reward-mediating brain areas. In this study, we investigated how exposure to vanilla flavor altered dopamine neurons of the ventral tegmental area (VTA). Male and female, adolescent $\alpha 4$ -mCherry $\alpha 6$ -GFP mice were exposed to an e-Vape self-administration assay and assigned to zero-nicotine, vanilla-flavored e-liquids (mixture of vanillin and ethyl vanillin). Following self-administration, brains were extracted and sliced to prepare sections that contain the VTA. To determine changes in nicotinic receptor density in the VTA, a confocal microscope was used to analyze the fluorescent density of $\alpha 4$ -mCherry and $\alpha 6$ -GFP nAChRs. We observed that mice exposed to vanilla flavor exhibited a decrease of $\alpha 6$ -GFP nAChRs. This suggests that nAChR assembly is shifted toward an $\alpha 4$ (non- $\alpha 6$) $\beta 2$ nAChR population that is easily desensitized in a manner that promotes dopamine release. These data provide valuable insight into why zero-nicotine, flavored vape products may promote addiction-related behaviors.

N/A

Abstract 66

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

Access to gender-affirming surgical care is vital for the well-being of transgender and gender-diverse individuals. In West Virginia, a predominantly rural area, such specialized services are scarce or unavailable. This study aims to evaluate the need and desire for gender-affirming urological procedures among the LGBTQ+ population in our community. By assessing interest in both top surgeries (e.g., chest masculinization or breast augmentation) and bottom surgeries (e.g., phalloplasty, metoidioplasty, vaginoplasty), along with gathering demographic information and identifying barriers to care, we sought to illustrate the potential demand for services not currently offered locally. The findings provided valuable insights that could inform the development of accessible, patient-centered care for this underserved population. Using the Qualtrics platform, an anonymous survey was constructed to assess interest in gender-affirming surgeries, demographic information, and barriers to accessing care. Surveys were distributed throughout the Huntington, WV community via flyers containing QR codes. Preliminary results indicate a need for gender-affirming care within the LGBTQ+ population. Detailed analysis of demographics, barriers to care, preferred surgery types, and additional factors will be discussed. Overall, these findings highlight gaps in healthcare access for the LGBTQ+ population and emphasize the urgent need to educate providers and support the development of gender-affirming urologic services in the Huntington area.

2268229-2

Abstract 67

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The Utility of CT Perfusion to Diagnose Hyperglycemia-Induced Hemichorea: A Case Report

Hyperglycemia can lead to many neurologic disorders, such as encephalopathy and hemichorea, and may be challenging to diagnose due to an overlapping presentation with ischemic stroke. Imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) are essential in differentiating these conditions. This case report details an 85-year-old female with neurologic deficits initially attributed to ischemic stroke. The use of CT perfusion studies and MRI revealed increased blood flow and volume in the left basal ganglia, as well as hypointensities on T2-weighted MRI. The imaging supported that the clinical presentation was most likely metabolic rather than infarction. After partial correction of hyperglycemia, the patient developed right-sided hemichorea. Our case highlights the use of imaging modalities to distinguish metabolic pathologies from stroke. On literature review, the use of CT perfusion imaging to support the findings of hyperglycemia-induced hemichorea has been rarely documented, showing a novel use to discern hyperglycemia-induced etiologies and stroke.

none

Abstract 68

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GLP-1 Agonists and Cholelithiasis: A Retrospective Cohort Study of Patients Undergoing Cholecystectomy in Huntington, West Virginia

Background: GLP-1 receptor agonists have become widely used for managing obesity and type 2 diabetes, yet studies have noted an association between these agents and an increased risk of gallstone formation. In Appalachia—where GLP-1 prescriptions are rising and metabolic comorbidities are highly prevalent—this relationship remains underexplored in surgical populations.

Objective: To evaluate the incidence of gallstones among patients undergoing cholecystectomy who were prescribed GLP-1 agonists, and to compare gallbladder pathology and clinical characteristics with those not on GLP-1 therapy.

Methods: This retrospective cohort study will analyze adult patients who underwent cholecystectomy at two hospitals in Huntington, West Virginia from January 2019 to December 2024. Patients will be categorized into two groups:

GLP-1 group – patients with documented use of GLP-1 receptor agonists (e.g., semaglutide, liraglutide) within 12 months prior to surgery

Control group – matched patients not on GLP-1 therapy

Clinical data will include demographic variables, BMI, diabetes status, weight change, imaging findings, intraoperative findings (presence of gallstones, inflammation), and pathology reports.

Expected Outcomes: We hypothesize that GLP-1 users will have a higher incidence of gallstones compared to matched controls, with more rapid onset of biliary symptoms following medication initiation. Findings could help identify patients at higher risk for GLP-1-associated gallstone disease and inform peri-prescription monitoring strategies.

Conclusion: This study will offer real-world data on the relationship between GLP-1 agonist use and gallstone formation in a high-risk Appalachian surgical population. Results may enhance awareness of this medication side effect and support more individualized risk assessment when initiating GLP-1 therapy.

2327506-1

Abstract 69

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A Cerebellar Catastrophe: Fulminant Cerebellar Edema following Accidental Poly-substance Drug Ingestion in a Toddler

Introduction: Pediatric opioid and stimulant ingestions are an emerging cause of severe neurologic injury. Rare syndromes such as POUNCE (Pediatric Opioid Use–Associated Neurotoxicity with Cerebellar Edema) highlight posterior fossa involvement beyond classical hypoxic injury. We report a 14-month-old female with polysubstance ingestion who developed cerebellar edema, tonsillar herniation, and obstructive hydrocephalus requiring neurosurgical intervention.

Case Presentation: A 14-month-old female was found unresponsive at her babysitter's home. She presented to the emergency department (ER) with altered mental status, pinpoint pupils, and a urine drug screen positive for fentanyl, methamphetamines, and cocaine. On arrival to the ER, she was intubated for airway protection. Toxicology confirmed markedly elevated fentanyl (>100 ng/mL), norfentanyl (>400 ng/mL), methamphetamine (1165.5 ng/mL), and benzoylecgonine (278.3). Within 12 hours, she developed bradycardia and hypertension. Neuroimaging revealed isolated malignant cerebellar edema with tonsillar herniation and obstructive hydrocephalus, while the other brain structures were preserved. Her urine toxicology screen remained positive for 36 days, despite her not receiving any opioids during her hospitalization. She had an unexpected neurologic recovery with return of brainstem reflexes, improved motor function, and progression to oral nutrition. She was transferred to the pediatric ward for neurorehabilitation.

Conclusion: This case illustrates catastrophic posterior fossa involvement following opioid ingestion in a toddler. It underscores the need for early neuroimaging, multidisciplinary management, careful sedation strategies, and awareness of prolonged fentanyl persistence. These findings broaden recognition of cerebellar injury in pediatric opioid toxicity and highlight the need for research into opioid–stimulant interactions.

Its a case report not requiring IRB or IACUC approval from our institution.

Abstract 70

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Early Walking, Lasting Benefits: Postoperative Day 1 Ambulation Distance Predicts One-Year Functional Outcomes After Total Hip Arthroplasty

Background: Total hip arthroplasty (THA) is a highly successful procedure indicated for the treatment of end-stage hip osteoarthritis. Early postoperative ambulation plays a crucial role in reducing the risk of short-term complications. However, despite its potential benefits, the impact of early ambulation on long-term functional outcomes, such as the Hip Disability and Osteoarthritis Outcome Score, Joint Replacement (HOOS-JR), has not been thoroughly investigated.

Methods: We retrospectively reviewed 322 primary THA patients at our institution from 2018 to 2024. Multivariable linear regression was conducted to evaluate the associations between post-operative day 1 (POD1) ambulation distance and one-year HOOS-JR, adjusting for preoperative HOOS-JR, age, sex, BMI, and ASA class.

Results: The mean distance ambulated on POD1 was 104.7 meters. The average preoperative HOOS JR score was 45.74 which improved to 85.09 at one year postoperatively. In a multivariable linear regression model of postoperative HOOS-JR scores, preoperative HOOS-JR scores were a significant positive predictor ($\beta = 0.33$, SE = 0.09, $t = 3.75$, $p = 0.001$), while POD1 ambulation distance was also a significant positive predictor ($\beta = 0.10$, SE = 0.04, $t = 2.67$, $p = 0.008$).

Conclusion: Surgeons and physical therapists can utilize POD1 ambulation distance as an early prognostic measure to identify patients at risk of not meeting short-term post-operative functional thresholds. Further prospective studies are warranted to confirm these findings in larger patient populations.

2327976-1

Abstract 71

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Inferior Prosthetic Hip Dislocation Requiring Revision: A Case Report

Introduction: Total hip arthroplasty (THA) is a highly successful orthopedic procedure performed for various indications. While rare, complications such as dislocation do occur. We present the case of a 59-year-old female who had a late inferior hip dislocation after a traumatic fall.

Presentation of Case: The patient who had a recent THA for femoral neck fracture experienced an incarcerated inferior prosthetic dislocation following mechanical fall. Revision surgical intervention yielded satisfactory stability, but patient noncompliance led to a subsequent dislocation, requiring another revision surgery. Despite failed attempts at closed reduction, a constrained acetabular liner was successfully implemented, resulting in a stable THA.

Discussion: This case underscores the complexities of managing inferior hip dislocations, particularly the importance of patient adherence to post-operative care and the need for tailored surgical approaches.

Conclusion: Further investigation into long-term outcomes associated with constrained liners in revision THA is warranted, as well as strategies to enhance patient compliance to mitigate complications.

None required. Approval was acquired from the patient

Abstract 72

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“Understanding the role of sex- and estrogen-dependent synaptic pruning by microglia in cortical development”

Glial cells have emerged as strong regulators of synaptic development in the central nervous system (CNS). Astrocytes influence synaptogenesis and maturation, primarily via secreted proteins such as thrombospondin (TSP), while microglia remodel existing synapses by way of phagocytosis (“synaptic pruning”). Previous rodent studies from our lab revealed that astrocytic TSP/neuronal $\alpha 2\delta$ -1 signaling, which plays a critical role in the development of VGluT1-positive intracortical synapses, is significantly sex-biased with a strong effect in males but a considerably weaker impact in females. Furthermore, manipulation of estrogen signaling revealed a strong interaction between estrogen and TSP/ $\alpha 2\delta$ -1 in regulating synaptic connectivity. However, these studies did not distinguish between differences in synapse formation and synapse elimination. Interestingly, the phagocytic capacity of microglia is known to vary significantly between males and females, leading us to hypothesize that the differences in synaptic density that we previously observed may be, at least in part, due to differences in microglia-mediated pruning. Wild-type (WT) and forebrain-specific $\alpha 2\delta$ -1 knockout (KO) male and female mice were injected with either estradiol (E2), letrozole (aromatase inhibitor), or saline from postnatal day 7 (P7) to P40 $\pm$ 2 (accounting for the 4-day mouse estrous cycle). Cryosections containing primary visual cortex were immunohistochemically stained for microglial marker Iba1, lysosomal marker CD68, and presynaptic protein VGluT1, then z-stacks of microglia were captured via confocal microscopy. Imaris software was used to create three-dimensional renderings of microglia, lysosomes, and presynaptic puncta. Analysis is currently ongoing but is expected to provide novel insight into sex and sex hormone-mediated effects on synaptic development.

IACUC 697

Abstract 73

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Attitudes and Beliefs of College Students towards Pain Management Modalities: Theory of Planned Behavior Approach.

Chronic pain exhibits a burdening onset and duration in young adults. It's critical to understand appropriate pain management decision-making.

Objective:

To investigate the associations of attitudes and beliefs of college students with their intention and behavior toward pain management modalities using the Theory of Planned Behavior (TPB).

Methods:

In this cross-sectional online survey study, we recruited college students (age ≥ 18 years) at West Virginia University, Morgantown, West Virginia, United States. We examined four pain management modalities: Over-the-Counter (OTC) pain medications, prescription pain medications (RX), mindfulness therapy, and yoga/exercise. Likert scales were used to assess TPB constructs (attitude, Subjective Norm [SN], Perceived Behavior Control [PBC], intention, and behavior). We analyzed the associations of the TPB constructs with both intention and behavior toward pain management modalities using multiple linear regression.

Results:

Of the 364 returned surveys, 227 were completed and analyzed. Attitude was found to be significantly associated with the intention to use all pain management modalities, while PBC was significantly associated with the intentions to use RX, mindfulness, and yoga/exercise (RX: $\beta = 0.38$; 95%CI= 0.28, 0.84; $p < 0.001$, mindfulness: $\beta = 0.27$; 95%CI=0.07, 0.76; $p = 0.019$, and Yoga/exercise: $\beta = 0.35$; 95%CI=0.25, 0.85; $p < 0.001$). Furthermore, the intention to use pain management modalities consistently predicted all behaviors (OTC: $\beta = 0.49$; 95%CI=0.32, 0.76; $p < 0.001$, RX: $\beta = 0.47$; 95%CI=0.17, 0.58; $p < 0.001$, Mindfulness: $\beta = 0.62$; 95%CI=0.40, 0.72; $p < 0.001$, Yoga/Exercise: $\beta = 0.59$; 95%CI=0.42, 0.84; $p < 0.001$).

Conclusion:

College students' attitude and PBC were top predictors of intention to choose pain management modalities, and intention predicted behavior. Research with robust study design is needed to confirm study findings.

#1902448962

Abstract 74

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Caught Between Infection and Autoimmunity: A Child with Linear IgA Dermatitis

Case Presentation: A 2-year-old boy was admitted with high fever and a rapidly spreading bullous rash involving the arms, legs, lower abdomen, perioral region, and genitalia (Figure 1). Laboratory evaluation revealed leukocytosis with neutrophilic predominance and mildly elevated inflammatory markers. Empiric broad-spectrum antibiotics were initiated. Skin biopsy confirmed the diagnosis of linear IgA bullous dermatosis (LABD) with secondary bacterial infection, as cultures from skin lesions grew both MRSA and Group A Streptococcus. After confirming normal G6PD activity, dapsone therapy was started; however, as new lesions continued to appear without clinical improvement, corticosteroids were added. This resulted in resolution of existing lesions and prevention of further lesion development.

Discussion: Linear IgA bullous dermatosis (LABD) is a rare blistering disease in children, characterized by linear IgA deposition along the basement membrane. Clinically, it can mimic staphylococcal scalded skin syndrome, toxic epidermal necrolysis, or Stevens–Johnson syndrome, making skin biopsy essential for accurate diagnosis. This case was unusual due to the patient’s young age and the presence of concurrent bacterial co-infection, necessitating careful balancing of immunosuppressive therapy with infection control.

Conclusion: Biopsy confirmed linear IgA bullous dermatosis with superimposed bacterial infection. The dual pathology made management difficult and required careful balance between antibiotics and immune suppression. Early skin biopsy and close teamwork were critical in achieving a good outcome.

Informed Consent obtained from Parents

Abstract 75

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HHV-6 Encephalitis in an Immunocompetent Child: A Steroid-Responsive Case Complicated by Cerebral Venous Sinus Thrombosis

Case Presentation: An 11-year-old male presented with bifrontal headaches, initially brief and infrequent but progressing to 12 episodes daily. Headaches were associated with photophobia, left eye twitching, and redness of both eyes. Initially suspected as cluster headaches, he was started on supportive therapy. Workup showed leukocytosis with a normal CT. His condition worsened from frequent headaches to refractory seizures. MRI revealed increased signal in the left medial temporal lobe, and EEG showed left-hemisphere spikes consistent with focal epilepsy without impaired awareness. He was transferred to the PICU for status epilepticus. CSF and serum PCR were positive for HHV-6. Despite antiepileptics and IVIG, his mental status declined. Repeat MRI revealed cerebral venous sinus thrombosis. Extensive autoimmune and infectious testing was negative. Marked improvement occurred only after corticosteroids.

Discussion: HHV-6 is usually associated with roseola, but here caused severe neurologic disease: encephalitis, seizures, and CVST. The key question was viral versus post-viral autoimmune encephalitis. Lack of response to IVIG and steroid responsiveness supported the latter. Hippocampal signal changes suggested mesial temporal sclerosis unmasked by inflammation. Infection-induced hypercoagulability is known in HSV and VZV, but HHV-6 is rarely implicated; the timing here supports a thrombotic trigger.

Conclusion: This case illustrates HHV-6 encephalitis in an immunocompetent child complicated by CVST and seizures. While antivirals are used in adults, pediatric evidence is limited. Absence of clear guidelines makes management difficult, and this case highlights the potential role of immunomodulation with corticosteroids.

Informed Consent obtained from Parents

Abstract 76

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Optimization of Peripheral Blood Smear Review Criteria to Reduce Unnecessary Reviews and Improve Clinically Relevant Findings

Peripheral blood smear (PBS) review is an essential diagnostic tool of hematopathology, but its overuse can strain limited laboratory resources without benefit to clinical outcomes. At Cabell Huntington Hospital, loosely defined criteria for manual differentials and pathologist review led to a high volume of PBS evaluations with relatively low diagnostic yield. To address this issue, stricter review criteria were implemented along with a requirement for clinicians to document the intended purpose of the ordered PBS review (e.g. suspicion for lymphoma). This quality improvement project aims to evaluate whether these changes have reduced unnecessary reviews while preserving detection of clinically significant findings. Two six-month periods, representing before and after implementation, will be analyzed. Primary data to be collected will include whether the review resulted in a clinically relevant morphologic finding and if so, what finding was identified. We anticipate a reduction in unnecessary reviews and an increase in the proportion of significant findings, indicating more efficient usage of laboratory resources without compromising diagnostic value. Results will guide future refinements in ordering practices and pathologist review criteria.

This is an internal quality improvement project intended for in-house presentation and does not constitute human subjects research; therefore, IRB or IACUC approval is not required.

Abstract 77

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Umbilical Cord Allografts for Complex Wound Treatment in a Community Hospital Setting

Background: Complex wounds are a significant cost burden to the healthcare system. This study evaluates the outcomes of umbilical cord allografts in facilitating wound healing in complex wounds.

Methods: We retrospectively reviewed patients who were treated with umbilical cord allografts for complex wounds at a community hospital. Wound types studied included traumatic wounds, surgical wounds, and wounds after therapy for necrotizing soft tissue infections. Data was collected on wound size at the start of treatment and time to healing. Other patient characteristics such as body mass index, smoking status, diabetes, venous disease, congestive heart failure, arterial disease, chronic obstructive pulmonary disease, and end-stage renal disease were considered as factors that could impede healing time. The percentage of patients requiring additional therapies was also recorded.

Results: A total of 23 patients were included in the initial analysis. Five were excluded; two who moved away and had no local follow up and three who died of unrelated causes. The mean wound size was 148.5 square cm, ranging from 4.0-384.0 square cm. The mean healing time was 18.2 weeks, ranging from 5-60 weeks. Larger size wounds correlated with longer healing durations. Additional allograft treatments were done in 8 out of the 19 included cases.

Conclusion: Umbilical cord allografts represent a promising therapeutic option for treating complex wounds in a community hospital setting.

20250702

Abstract 78

~Cavendish, J¹, Garan, R¹, Gibbs, M¹, Harris, E¹.

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Severe Dysgeusia and Weight Loss Associated with Terbinafine Use: A Case Report

Terbinafine is an allylamine antifungal frequently prescribed for dermatophyte infections such as onychomycosis and tinea rubrum. Its mechanism of action involves inhibition of squalene epoxidase, disrupting ergosterol synthesis and fungal cell membrane integrity. While generally well tolerated, terbinafine has been linked to uncommon adverse effects, including dysgeusia, a disturbance in taste perception. Reported incidence ranges from 0.6% to 2.8%, though it may be underrecognized in clinical practice. Risk factors include advanced age and low body mass index, both of which may contribute to heightened susceptibility. Symptoms typically emerge within weeks of therapy initiation and may persist for months after discontinuation.

We describe a 72-year-old female with tinea unguium who developed severe dysgeusia one week after starting terbinafine 250 mg daily. She experienced a persistent metallic taste, aversion to sweet foods, and reduced oral intake leading to a 35-pound weight loss over three months. Laboratory testing revealed hypokalemia and hypomagnesemia requiring emergency replacement. Despite an extensive workup, including gastrointestinal endoscopy, cross-sectional imaging, and otolaryngologic evaluation, no alternative etiology was identified. Terbinafine was discontinued after 33 days, resulting in gradual but incomplete recovery of taste and partial weight gain.

This case underscores terbinafine-induced dysgeusia as a rare but clinically significant adverse drug reaction. The profound nutritional consequences observed highlight the need for early recognition and discontinuation of the offending agent. Clinicians should maintain vigilance for new onset dysgeusia in patients receiving terbinafine, particularly older adults or those with low BMI. Multidisciplinary management and close nutritional monitoring are critical to mitigate complications and support recovery.

None required. Case report research with patient written consent.

Abstract 79

~Modi, K¹, Torres, G², Reyes, R², Miles, S³, Dasgupta, P³.

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Effect of Nicotine on the Growth of Human Ovarian Clear Cell Carcinoma

Human ovarian clear cell carcinoma (OCCC) is an uncommon yet aggressive form of epithelial ovarian cancer that frequently presents at advanced stages, where it demonstrates strong resistance to standard chemotherapy and is linked to poor outcomes. Interestingly, epidemiological studies have indicated that smoking may lower the risk of developing OCCC. Nicotine, the addictive compound in cigarette smoke, has been shown in published research to regulate tumor growth through nicotinic acetylcholine receptors (nAChRs) expressed on target cells. The central hypothesis of our study is that nicotine suppresses the growth and progression of human OCCC.

In our initial set of experiments, we evaluated the effect of nicotine on the viability of human OCCC cell lines (TOV21G and SKOV3) using the MTT assay. We found that nicotine reduced the viability of both TOV21G and SKOV3 cells in a concentration-dependent manner over 24 hours. The concentration of nicotine in the blood of moderate smokers typically ranges from ~100 nM to 10 μ M. Within this physiological range, MTT assays revealed that nicotine markedly decreased the viability of TOV21G and SKOV3 cells.

Future work will focus on identifying the signaling pathways that mediate this growth-inhibitory effect of nicotine in human OCCC cells. Such studies may help uncover novel molecular targets with potential therapeutic relevance for the treatment and management of OCCC.

No approval number

Abstract 80

Thorp, A¹, *~Siler, A², Wurst, B², Noble, J².

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Effect of Nicotine on the Growth of Human Ovarian Clear Cell Carcinoma

Background: Food insecurity is a major social determinant of health that is linked to worse psychiatric outcomes but is not routinely assessed in inpatient psychiatry. Identifying food insecurity at discharge can help connect patients with community resources.

Objective: This quality improvement project will implement a discharge questionnaire to assess food insecurity in inpatient psychiatric patients and explore its relationship with psychiatric symptoms such as depression and anxiety.

Methods: We will implement a quality improvement project to add a brief, verbally administered food insecurity questionnaire at psychiatric discharge. We chose this timing to ensure screening happens after patient-provider trust is established and to account for literacy barriers. Patients who screen positive will be connected with food banks, churches and other local resources through social work and discharge planners. Measures include food insecurity prevalence, correlation with psychiatric symptom burden, patient acceptability of screening, and number of referrals.

Results (Expected): We expect a higher than expected percentage of psychiatric inpatients to screen positive for food insecurity and that unmet food needs will be correlated with greater psychiatric symptom burden. We expect a structured questionnaire to improve identification of at-risk patients and linkage to food resources.

Significance: Food insecurity screening at discharge is feasible and patient centered. This project addresses a critical social determinant of health and can be a model for other psychiatric settings to improve psychosocial outcomes.

This is a QI project

Abstract 81

*~Tyler, K¹, *~Shrinivas, K¹, Franks, A².

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Tobacco Screening Rates in Marshall University Department of Family Medicine - A Quality Improvement Project

Tobacco use is a critical health metric in primary care, as tobacco-related illnesses remain a leading cause of preventable morbidity and mortality in the United States. At our institution, screening rates for tobacco use were lower than expected due to multiple contributing factors. We aimed to increase and maintain screening rates of > 90% for the patients in the Family Medicine Department through December 31, 2025 to support healthier outcomes through early intervention.

Quality Improvement methodology was utilized in the PDSA model to address barriers impacting Tobacco Screening. Cycle 1 identified an issue with provider understanding of the importance of the measure, which was addressed with education. Cycle 2 reshaped the nursing protocol used to accurately chart and retain screening data. Cycle 3 rectified discrepancies in patient-provider attributions within the EMR. Cycle 4 is ongoing and involves the development of a prioritization metric to determine which patients should be contacted first for screening by completion of a thorough chart review.

As a result of these interventions, the tobacco screening metric exceeded our screening rate goal of greater than 90%, with an increase from 82.1% to 94.5% from June 2024 to September 2025. Insights gained from this project will inform broader implementation strategies across similar underserved communities, contributing to a scalable model for preventive care improvement in primary care settings. The principles and strategies discovered through this Quality Improvement Project should also impact other quality measures with relevance to primary care.

Quality Improvement projects such as this do not require an IRB.

Abstract 82

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Leveraging early life neurotoxic insult to elucidate tripartite synaptic development and maturation in the prefrontal cortex

Astrocytes, the primary glial cell type in the central nervous system (CNS), play a central role in promoting synaptic development and regulating brain homeostasis. Astrocyte dysfunction at the "tripartite synapse" is thought to contribute to pathology in psychiatric and neurological disease, but long-term consequences of disruptions in tripartite synaptic development during early life are still largely unknown. Here, we used prenatal opioid exposure (POE) as a model of early life neurotoxic insult to study tripartite synaptic development in the prefrontal cortex. Pregnant C57Bl/6J mouse dams were orally dosed with sweetened condensed milk either by itself or containing the opioid buprenorphine (5 mg/kg) daily from gestational day 7 until postnatal day 11 (P11). On PO-2, pups received retroorbital injections of systemic PHP.eB adeno-associated viruses (AAVs) carrying cell type-specific reporters for either neurons (i.e. CaMKII-mCherry) or astrocytes (GFAP-IckGFP, GFAP-mKate2.5, or GFAP-smV5). Following animal sacrifice between days P30-P35 (equivalent to mouse adolescence), brains were fixed-frozen with 4% paraformaldehyde followed by changes in 30% sucrose and tissue freezing medium. 10 micron thick sections containing PFC were then processed for either spatial transcriptomics (Visium HD, 10x Genomics) or fluorescence immunohistochemistry; the latter of which was followed by imaging via either standard confocal or super-resolution stimulated emission depletion (STED) microscopy. Following acquisition of optical z-stacks, images were processed with Autoquant X3 deconvolution software and then modeled into surface and filament reconstructions using the Imaris software suite. This combination of confocal/STED microscopy and spatial transcriptomics allows for novel insights into long-term tripartite synaptic dysfunction after POE.

IACUC 697

Abstract 83

Saunders, E¹, ~Adubofour, G¹, *Depew, I², Dudich, M².

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Severe Guillain-Barré Syndrome Secondary to West Nile Virus Infection: A Case of diagnostic delay and severe neurologic decline in a non-endemic area

Introduction: Guillain-Barré Syndrome (GBS) is an acute immune-mediated polyneuropathy characterized by ascending weakness, sensory disturbances, and areflexia. It is frequently associated with preceding infections such as Cytomegalovirus, Campylobacter jejuni and Epstein-Barr virus. While West Nile Virus (WNV) is endemic in the United States, its association with GBS is mostly underrecognized, posing unique diagnostic challenges particularly in patients who present with overlapping neurological manifestations, including encephalitis and meningitis. Early recognition and treatment are critical to preventing severe complications and improving outcomes.

Case Presentation: A 55-year-old male with no prior neurological history presented with progressive weakness and respiratory decline after a febrile illness. GBS was not initially considered, leading to delayed diagnosis and treatment. On hospital day 5, lumbar puncture results confirmed GBS and IVIG was initiated. Despite treatment, he required escalation to ICU care for mechanical ventilation. Viral PCR testing eventually confirmed WNV. His course was complicated by pneumonia and Ogilvie syndrome. The patient exhibited toe movement and intact sensation by day 32 and was stable for discharge to rehabilitation.

Discussion: GBS itself is uncommon, with WNV-associated GBS representing an even smaller subset of cases. Most WNV infections are largely asymptomatic, complicating clinical detection. This case was further complicated by WNV being non-endemic in West Virginia.

Conclusion: This case highlights the critical importance of early recognition and intervention in GBS particularly in the setting of post-viral illness and a high index of suspicion for WNV-associated GBS, even in non-endemic areas to decrease morbidity and improve outcomes.

None

Abstract 84

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Complete Heart Block Following a Left Carotid Endarterectomy

Background: Bradyarrhythmias are common after carotid surgery, generally transient and are thought to be related to carotid sinus and baroreceptor manipulation. In contrast, complete heart block is rare following carotid endarterectomy (CEA).

Case: A 70-year-old man with a history of hypertension and symptomatic severe left carotid artery stenosis presented for an elective left CEA. Following completion of the procedure, he developed sudden bradycardia while in the recovery area prompting a cardiovascular consultation. Examination of the surgical site did not show evidence of a cervical hematoma. EKG demonstrated complete heart block (CHB) with a ventricular escape rhythm of 38 beats per minute. Review of preoperative EKG 5 days earlier identified first-degree atrioventricular block, RBBB and LAFB consistent with a trifascicular block. On further history, he reported a gradual decline in activity tolerance in the prior months. Given preoperative EKG findings and progression to CHB, decision was made to insert a temporary transvenous pacemaker followed by a permanent pacemaker implantation the next day. The patient's postoperative course was unremarkable.

Decision-Making: Physicians are frequently consulted for presurgical cardiac risk assessment which typically includes a review of the patient's symptoms, EKG and other ancillary testing. Bradyarrhythmias are common after CEA. They are usually transient and most often attributed to carotid sinus and baroreceptor manipulation resulting in an exaggerated vagal reflex. However, CHB is very rare following CEA. In our patient, there was no evidence of a neck hematoma on physical examination, and evaluation for possible reversible causes was unrevealing. Our patient's progression to CHB was most likely unmasked by carotid endarterectomy. Given the patient's symptoms, trifascicular block on baseline EKG and high risk of future CHB recurrence, permanent pacemaker implantation was considered appropriate.

Conclusion: The presence trifascicular block on preoperative EKG may be a risk factor for progression to CHB after CEA and this finding should be taken into consideration during preoperative cardiac risk evaluation.

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Poster Session 2

Abstract 85

~Eastman, J¹, Finch, P², Preston, D³, Andrew, B¹, Krutzler-Berry, D⁴, Hess, J².

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Introducing envmed: Software for Identifying Disease Clusters in Complex Environments through Hydrologic Modeling

Problem: Classic epidemiologic surveillance of geographic disease clusters assumes flat land and uniform distribution of exposure to sources per radial distance from source – i.e., draw circles on a map and count cases and population within those circles. However, this approach fails to account for true physical flow of environmental fluids, where landscape features such as mountains and valleys dictate the directions of flow and generate terrain-specific networks between homes. Without accounting for topography in a mountainous landscape, classic circles-on-a-map clustering analysis will fail to identify true environmental exposure relationships.

Our Solution: We have developed envmed: a complete, bespoke, and general computational pipeline for the identification of disease clusters according to hydrologic (as the water flows) relationships. With only geographic locations of cases (addresses at time of diagnosis), a boundary of analysis, and local and national case rates as inputs, envmed (1) automatically integrates publicly available digital elevation, population (census), and nighttime lights data, (2) computes streamlines, watersheds, and hydrologic case networks, (3) computes case rates for each hydrologically defined area and (4) compares these to local and national averages to identify “clusters” according to the most recent CDC definitions.

Demonstration: We have successfully identified pediatric and breast cancer clusters using envmed for the local Marshall Health patient population. These results are presented separately.

Impact: envmed is generalizable in space, time, and disease and can rapidly scale the identification of disease clusters in all terrains, improving surveillance and prevention of all disease processes.

2136738-1 (pediatrics study, Hess as PI), 2287729-1 (breast study, Krutzler-Berry as PI)

Abstract 86

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Total Knee Arthroplasty Post Operative Day 1 Ambulation Distance and Association with Long Term Functional Outcomes

Introduction: Early mobilization after total knee arthroplasty (TKA) improves outcomes and reduces complications, but postoperative day 1 (POD1) ambulation distance varies. This study evaluated the association between POD1 ambulation distance and 1-year functional outcomes.

Methods: We retrospectively reviewed 667 patients undergoing primary TKA from June 2018 to July 2024. Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOSJR) was collected preoperatively and at 1 year. POD1 ambulation distance was measured in meters and stratified into <50 or ≥50. A KOOSJR ≥71 at 1 year defined Patient Acceptable Symptom State (PASS). Demographics and ASA classification were recorded. Bivariate analysis and logistic regression identified predictors of PASS.

Results: Mean age was 68.7 years, BMI 33.7, with 68.2% females. Mean preoperative KOOSJR was 48.6 (SD 11.1) and postoperative 79.5 (SD 14.3), an average increase of 30.9 (SD 16.7). Mean POD1 ambulation was 42.3m (SD 19.2). PASS was achieved in 66.7% of patients ambulating <50m (n=474) and 71% of those ambulating ≥50m (n=193), with no significant difference (chi-square p=0.321, Fisher's exact p=0.314). Logistic regression showed POD1 ambulation ≥50m was not significantly associated with PASS. Age, sex, BMI, and ASA class were also not significant predictors.

Conclusion: In our study, greater POD1 ambulation distance was not associated with improved functional outcomes at 1 year after TKA. Demographic and perioperative factors likewise did not predict achieving PASS. Larger studies using continuous measures of POD1 ambulation are needed to clarify its relationship with long-term functional outcomes.

Abstract 87

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Fungating mass of the glans penis: a case report and discussion on Penile Squamous Cell Carcinoma

Penile squamous cell carcinoma is a rare presentation in the United States and Europe, accounting for only 1% of male malignancies. Most commonly due to Human Papilloma Virus, PSCC has an insidious onset that is often ignored by patients until functional impairments are present. This report outlines an interesting presentation of penile squamous cell carcinoma while focusing on current developments in the prognosis and treatment of PSCC. We present the case of a 68-year-old male who presented with a 5cm fungating mass of the glans penis after emergent care following an MCA stroke. Visual inspection revealed a large mass of the glans penis which had completely obliterated the urethral meatus. A partial penectomy and urethrostomy were performed. Surgical excision revealed a unifocal moderately differentiated (G2) squamous cell carcinoma, with immunohistochemical staining demonstrating p16 positivity, consistent with human papillomavirus (HPV)-associated etiology. This case highlights the importance of individualized treatment regimens and prognostic determination for optimal patient outcomes.

Our institution does not require ethical approval for reporting individual cases or case series.

Abstract 88

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~indicates presenting author(s)

Right Test, Right Time: Improving Echocardiography Ordering Practices

This study aims to assess current echocardiography ordering practices in an acute care hospital setting and identify patterns of inappropriate or delayed use. This information could help to provide education, clinical decision support tools, and feedback mechanisms. The primary goal is to improve adherence to evidence-based guidelines, reduce unnecessary testing, and promote timely use of echocardiography where clinically indicated. Improving test stewardship aligns with broader institutional and national priorities to enhance patient safety, optimize resource utilization, and deliver high-value care. This study presents minimal risk to patients, as it involves retrospective and prospective analysis of standard clinical data.

2326803-1

Abstract 89

~Kingson, I¹.

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The Protective Role of Faith in Rural Muslim Medical Student Wellness

Background: Medical students experience high levels of stress and burnout, and these challenges may be intensified in rural settings where diversity is limited and institutional support for minority religious practices may be less developed. For Muslim medical students, Islamic faith practices such as prayer, fasting, Qur'an recitation, and community engagement may serve as important protective factors that support resilience and well-being. To date, little research has examined the role of faith in the wellness of Muslim medical students, particularly in rural environments.

Objective: This study aims to evaluate the perceived protective role of Islamic faith on stress and burnout among Muslim medical students in a rural medical school setting.

Methods: We will conduct a cross-sectional, anonymous online survey of Muslim medical students enrolled at Marshall University Joan C. Edwards School of Medicine. The survey will include demographics, frequency of religious practices (prayer, fasting, Qur'an recitation, and community involvement), Likert-scale items assessing the protective role of faith, and the WHO-5 Well-Being Index. Quantitative analysis will include descriptive statistics, correlations, and regression models to examine associations between religious practice and well-being. Qualitative free-text responses will be thematically analyzed to capture lived experiences.

Expected Significance: This study will provide novel insights into how Islamic faith functions as a coping mechanism for Muslim medical students in a rural training environment. Findings may inform faith-sensitive wellness initiatives, highlight the need for institutional accommodations, and contribute to a more inclusive approach to medical student well-being.

N/A

Abstract 90

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NR3C1 Epigenetic Analysis Between Mother-Neonate Dyads in a Medication-Assisted Treatment Program for Substance Use Disorder

Stress is a powerful force which shapes addiction recovery. Its biological imprint is hypothesized to have a profound affect on relapse and resilience. We examined methylation patterns of stress-associated genes in salivary samples with recovery outcomes in adults enrolled in a recovery program for substance use disorder (SUD). Nuclear Receptor Subfamily 3 Group C Member 1 (NR3C1), which codes for the neurospecific glucocorticoid receptor, is a critical regulator of the hypothalamic-pituitary-adrenal axis and other genes associated with HPA axis activity was tested for epigenetic modification through methylation. Biological sex-specific patterns of CpG site-specific methylation of these stress-related relapse genes were identified, suggesting that NR3C1 and stress gene methylation patterns may serve as a biomarker for recovery outcomes.

We are extending this work by exploring whether NR3C1 methylation changes are heritable. We are collecting saliva samples from 44 mother-infant dyads, including mothers with prior SUD and non-SUD controls, recruited from the Mother-Baby Unit and Neonatal Transitional Unit at Cabell Huntington Hospital immediately after delivery. Mothers completed surveys on environmental stressors and stress management, including the Pediatric Adverse Childhood Experiences and Related Life Events questionnaire, Civilian PTSD Scale, and a Patient Health Questionnaire-Somatic, Anxiety, and Depressive Symptoms at the first visit. At one month postpartum, mothers complete the Parenting Stress Index. Saliva samples will be analyzed for similar methylation patterns to determine heritability. Analysis is ongoing on this second phase, this project aims to provide insight into the inheritance of stress-related epigenetic changes and their impact on early-life vulnerability.

2110791

Abstract 91

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Correlation Between Perinatal Omega-3 Nutrition and Prevention of Postpartum Depression in Disadvantaged Populations

Postpartum depression, defined as a severe mood disorder within the first year following pregnancy, disproportionately affects individuals in underserved communities. This association is influenced by limited access to healthcare and food, as well as financial barriers. Nutritional interventions, such as supplementation with omega-3 fatty acids during pregnancy, have only more recently entered the discussion as a potential preventative intervention for postpartum depression. This paper investigates the role of the gut microbiome in relation to mental health, the benefits of omega-3 as a nutrient and supplement, and further seeks to identify the correlation between omega-3 supplementation and postpartum depression focusing on marginalized communities. The research suggests that there is a correlation between decreased depression symptoms and omega-3 supplementation; however, there have not been any trials to determine if this is a causal relationship using community-based trials. Similar studies and findings have been reported for dietary patterns and modifications that seek to naturally increase omega-3 uptake, such as the Mediterranean diet, and the role they play in promoting mental health. While there are mixed results through various sources regarding omega-3's role in rates of depression, this is a topic that needs further examination. We believe this research is a major step towards finding more accessible and cost-effective ways to promote early intervention and prevent postpartum depression, especially within marginalized communities.

Given this was a literature review, IRB approval was not required.

Abstract 92

~Adeshina, B¹, Jowan AN¹, Diks, J².

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The Irony of Iron: A Case Series on Atypical Pill-Induced Gastritis

Background: Iron deficiency anemia is often treated with oral ferrous sulfate. While mild gastrointestinal (GI) side effects are common, a more severe but underrecognized complication is iron pill-induced gastritis, caused by direct corrosive injury to the mucosa. It can mimic other GI disorders, as illustrated by the following two distinct cases.

Case Presentations: Case 1: A 56-year-old woman with chronic NSAID use presented with a two-year history of post-prandial abdominal pain and vomiting. Endoscopy with biopsy revealed mucosal erosions and crystalline iron deposits, confirming iron pill gastritis. This case illustrates a chronic, dyspeptic presentation easily confused with other gastropathies.

Case 2: A 69-year-old man with advanced bladder cancer developed a severe postoperative upper GI bleed requiring transfusions. After an initial inconclusive endoscopy, repeat biopsy identified iron pill gastritis. Oral ferrous sulfate was discontinued, with plans for intravenous iron supplementation.

Discussion: Iron pill gastritis may present as chronic, nonspecific dyspepsia or acute, life-threatening bleeding. A high index of suspicion is warranted in patients on oral iron with persistent GI symptoms or worsening anemia. Histopathologic confirmation is diagnostic and guides cessation of the offending agent.

Conclusion: Although uncommon, iron pill-induced gastritis carries significant morbidity if unrecognized. Clinicians should include it in the differential for dyspepsia or GI bleeding in iron-treated patients. Broader awareness, combined with further study of incidence, risk factors, and prevention, may reduce delays in diagnosis and support safer iron replacement strategies.

None

Abstract 93

~Farrell, C¹, Liang, N¹, Stuart, B¹, Cook, S².

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Treatment Challenges in Pediatric Warts: Recurrence After Cantharidin Application

Cutaneous warts are among the most common pediatric skin conditions, and while many resolve spontaneously, some require treatment due to pain, persistence, or recurrence. Cantharidin is a popular choice in pediatrics because it is painless on application and initially effective, but recurrence after treatment remains a challenge.

We present the case of an 8-year-old boy with a recurrent periungual wart on the right ring finger following cantharidin monotherapy. The lesion enlarged after treatment, forming a ring-shaped recurrence. On examination, a verrucous papule was noted on the digit along with multiple untreated molluscum lesions in the left axilla. Given parental concern and prior treatment failure, the wart was managed with a compounded topical therapy containing 5-fluorouracil and salicylic acid.

Cantharidin alone achieves clearance rates above 80 percent but is associated with recurrence in up to half of patients within a year. Combination therapies such as CPS (cantharidin, podophyllin, salicylic acid) lower recurrence rates but often increase pain and adverse effects. Other modalities, including cryotherapy, salicylic acid, immunotherapy, and topical 5-fluorouracil, carry their own advantages and drawbacks.

This case highlights the limitations of cantharidin monotherapy and emphasizes the importance of individualized treatment in pediatric patients. A review of current therapies demonstrates that no single option is universally effective, and management requires balancing clearance, recurrence risk, and tolerability.

No IRB or IACUC was required

Abstract 94

~Phipps, M¹, Elkins, E¹, Sharareh, N², Tang, S³, Hernandez, I³, Sheppard, J⁴, Carico, R⁴.

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The Commute to Care: How Pharmacy Access Impacts Hypertension

Purpose: This study was performed to evaluate potential health disparities amongst the population in West Virginia based on pharmacy access. Researchers analyzed the correlation between travel time to a pharmacy and the rate of self-reported hypertension medication non-adherence.

Methods: This cross-sectional study used data collected by researchers for a previous study (J Am Pharm Assoc (2003). 2024;64(2):476-482. doi:10.1016/j.japh.2024.01.004). Data were obtained from the 2015 National Council for Prescription Drug Programs and 2020 Decennial Census, and analyzed with ArcGIS StreetMap Premium. These data were combined with average self-reported rates of hypertension medication adherence rates at the census tract level from the CDC PLACES database. Simple regressions assessed the relationship between pharmacy access and medication adherence.

Results: A total of 546 census tracts in West Virginia were analyzed. For every additional pharmacy per 10,000 people within a 20-minute drive, there is a 0.263 percentage point increase in patients with self-reported hypertension who were taking antihypertensive medications (95% CI: 0.061–0.468).

Conclusion: This study showed an increase in patients treated for hypertension when the patients lived within 20 minutes of a pharmacy: approximately 4 additional pharmacies per 10,000 people might be associated with a 1% increase in rates of medication adherence for hypertension. Our findings prompt exploration into the extent to which limited access to medical care in West Virginia contributes to undiagnosed conditions. These findings are limited by unobserved potential confounders.

This study was declared to be not human subjects research and thus not subject to IRB review by the Marshall University Office of Research Integrity

Abstract 95

~Copley, JP¹, Perelman, S¹, Sword, MK¹, Shergill, M¹, and Henderson, BJ¹

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"The Role of Vanilla Flavoring in Driving Addiction-Like Responses to Zero-Nicotine Vaping Products"

ENDS products differ from cigarettes by offering appealing flavors, which may contribute to their widespread use. Previous work shows flavors like menthol and green apple enhance nicotine reward through dopamine signaling changes. We tested whether vanilla flavorants (vanillin and ethyl vanillin) affect reinforcement in adolescent C57BL/6J mice. Using an e-vape self-administration model, we found that zero-nicotine vanilla-flavored ENDS products promoted reinforcement-related behaviors in both males and females. Nicotine did not significantly increase active responses or deliveries but did shift the active-to-inactive ratio. Strikingly, vanilla flavorants alone potentially modulated dopamine release in the nucleus accumbens core. These results suggest that some flavors can drive addiction-related behaviors without nicotine, raising important questions about how flavor chemicals themselves influence abuse liability.

Abstract 96

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² Marshall University OB/GYN

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Delayed Interval Delivery after Previa Rupture of Membranes

In twin pregnancies, previa rupture of membranes is often complicated by spontaneous preterm delivery, significantly increasing the risks of morbidity and mortality to both fetuses. Delayed-interval delivery, while not a standard approach, is a unique management strategy that can allow the remaining fetus to reach viability in-utero and subsequently increase the risk for neonatal survival. We report a case of delayed-interval delivery in a dichorionic diamniotic twin pregnancy following previa rupture of membranes of twin A at 18 weeks and 5 days (18W5D) gestation with subsequent vaginal delivery. Pregnancy was successfully prolonged for 33 days before rupture of membranes of twin B with suspected chorioamnionitis at 23W3D gestation. This case highlights the potential of delayed-interval delivery to prolong gestation and improve neonatal outcomes, although thorough patient counseling, individualized management, and careful monitoring for detection of maternal and fetal complications are crucial for its success.

This case report did not require IRB approval as it does not meet the definition of human subjects research. Written informed consent was obtained from the patient.

Abstract 97

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Pharmacy Accessibility and Health Outcomes: Evaluating Drive-Time to Pharmacies as a Predictor of Diagnosis of Hypertension, Diabetes, and Arthritis Among Adults in West Virginia

Purpose: The emergence of pharmacy deserts in recent years raises concerns that areas with limited pharmacy access also experience limited access to non-pharmacy healthcare services. This study was conducted to analyze the association between pharmacy access in West Virginia and rates of diagnosis for various conditions as assessed by Center for Disease Control (CDC) Program to Local Area and Community Health Extrapolation (PLACES) Health Outcomes.

Methods: This cross-sectional study used an analysis of pharmacy access across the United States, as determined at the census tract level using the 2-step floating catchment area (2SFCA) method. Average rates of diagnosis for three health conditions—hypertension, diabetes, and arthritis—were extracted from CDC PLACES data at the census tract level. A linear regression analysis was conducted to model the relationship between pharmacy access and the rates of diagnosis for these conditions.

Results: We found significant relationships between pharmacy access and rates of diagnosis for hypertension, diabetes, and arthritis ($p < 0.05$ for each). Specifically, we found a 0.265% (± 0.104), 0.157% (± 0.060), and 0.276% (± 0.113) increase in the rate of hypertension, diabetes, and arthritis diagnoses, respectively, for every additional pharmacy per 10,000 people within a 20-minute drive.

Discussion: Our analyses demonstrated a significant association between pharmacy access and rate of diagnosis. Despite statistically significant predictors, the measured R² for each analysis was 0.01 suggesting that pharmacy access may only explain a small portion of the variation in the rate of diagnosis due to potential confounding.

No IRB approval required as this is not human subjects research.

Abstract 98

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Synthetic Coolants WS-3 and WS-23 Enhance Nicotine Reinforcement-related Behavior and Nucleus Accumbens Core Dopamine Release in a Mouse Model of Vapor Self-administration.

Flavor additives in electronic delivery systems (ENDS) have been shown to enhance nicotine reinforcement. Some states and cities have pursued implementation of menthol bans and one industry response has been the replacement of menthol with synthetic coolants such as WS-3 and WS-23. 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 the mice that were 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 DA 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, the enhancement by synthetic coolants was similar to menthol-induced enhancements. The combination of these findings suggest that synthetic coolants enhance nicotine reinforcement, potentially by mechanisms identical to menthol.

Abstract 99

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Provider Variability of pain management of distal radial fractures in the Appalachian population

Distal radial fractures are among the most common orthopaedic injuries, often associated with significant pain and discomfort. However, optimal pain management strategies for these fractures, particularly within underserved populations such as the Appalachian region, remain poorly understood. Variability in pain management practices among healthcare providers may contribute to differences in patient outcomes and experiences. The aim of this research is to analyze provider variability pertaining to the pharmacological pain management of distal radial fractures in adults. Each provider utilizes specific modalities of pain management based on their: surgical approach, complexity of the fracture, patient's past medical history, pain tolerance, prior recreational drug usage, bone fragility, etc. This study will focus on the unique Appalachian demographic characteristics such as, high prevalence of opioid usage, varying availability to resources, high prevalence of obesity, and predominantly Caucasian population. Through the means of extensive chart reviewing, this project will provide a better understanding of the patient-specific variables potentiating increased opioid therapy. (Ex. Patient demographics/fracture features/Immediate/management/Time to reduction/Conservative vs. ORIF approach/ past medical history/Social History).

2206309-2

Abstract 100

Burbelo, A¹, ~Cobbs, J¹, Huffman, B¹, Kanaan, A¹, Khan M¹, Cleary, L¹, Singla, A¹, Bullock, M¹

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Smoking History and General Anesthesia Are Associated with Increased 90-Day Readmission Following Total Knee Arthroplasty: A Retrospective Cohort Study

Introduction: Total knee arthroplasty (TKA) ranks among the most frequently performed surgeries in the United States, with procedure volume projected to grow by approximately 85%, reaching an estimated 1.26 million annual cases by 2030 [1]. Although TKA is typically performed safely as a same-day or short-stay outpatient surgery, its most frequent complications- periprosthetic joint infection and venous thromboembolism-continue to drive early postoperative morbidity and readmissions [2-4]. Since unplanned readmission poses significant clinical risk, it is necessary to identify modifiable perioperative factors that contribute to readmissions. Cigarette smoking remains a well-established predictor of poor arthroplasty outcomes among patient-related risk factors, with cohort and meta-analytic studies associating postoperative smoking with higher rates of lower respiratory infections, greater analgesic requirements and increased 30-day readmission rates [5,6]. Despite this, the combined impact of smoking history and anesthesia type on readmission risk remains largely unexplored in TKA populations.

Methods: We retrospectively reviewed 742 adults who underwent primary TKA performed by four fellowship-trained arthroplasty surgeons at a single academic institution between September 2020 and April 2025 (IRB-approved). Patients were stratified by smoking status (nonsmoker vs. smoker [former or current]) and anesthesia type (regional vs. general) into four groups: nonsmoker + regional (NR), smoker + regional (SR), nonsmoker + general (NG), and smoker + general (SG). Demographic data (age, sex, BMI, ASA score), perioperative variables including intraoperative mean arterial pressure (MAP), and postoperative outcomes were obtained from the electronic medical record. The primary outcome was 90-day all-cause readmission; the secondary outcome was 90-day periprosthetic joint infection (PJI) confirmed by ICD-10 codes and adjudicated using the 2018 Musculoskeletal Infection Society (MSIS) criteria. Group comparisons were performed using ANOVA for continuous variables and Fisher's exact test for categorical variables. Multivariable logistic regression was used to identify independent predictors of 90-day readmission and PJI, adjusting for age, sex, BMI, and ASA score. All analyses were conducted using R version 4.4.3, with significance set at $p < 0.05$.

Results: All four groups experienced a decrease in intraoperative MAP from baseline. The nonsmoker + regional (NR) group ($n = 461$) had the largest average drop (37.2 ± 14.0 mmHg) and served as the reference. Mean MAP drops were lower in the smoker + regional (SR) group ($n = 212$) (33.9 ± 13.1 mmHg, $p < 0.05$), nonsmoker + general (NG) group ($n = 43$) (28.3 ± 12.3 mmHg, $p < 0.001$), and smoker + general (SG) group ($n = 26$) (28.2 ± 15.5 mmHg, $p < 0.05$). Ninety-day all-cause readmission rates differed significantly between groups (unadjusted $p = 0.0011$). The SG group had the highest readmission rate (11.5%), followed by SR (4.2%), NG (2.3%), and NR (0.9%). Adjusted pairwise comparisons showed significantly higher readmission rates in SR (Holm-adjusted $p = 0.027$) and SG ($p = 0.025$) compared with NR, with no other significant differences. PJI incidence did not significantly differ between groups ($p = 0.090$).

Conclusion: Smoking history—regardless of anesthesia type—was associated with significantly higher odds of 90-day readmission following primary TKA, and patients in the smoker + general (SG) group had the highest risk. Both smoker + regional (SR) and smoker + general (SG) groups demonstrated higher readmission rates compared with nonsmoker + regional (NR), suggesting that smoking remains a dominant modifiable patient-level risk factor, and the use of general anesthesia may heighten this risk.

Abstract 101

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Follicular Lymphoma and Breast Lymphomas: Current Review of Clinical Features, Pathology, and Therapeutic Approaches

Primary Lymphoma of the Breast (PBL) is a rare type of non-Hodgkin's lymphoma, consisting of various subtypes including Diffuse Large B-Cell Lymphoma (DLBCL), Follicular Lymphoma, MALT lymphoma, Burkitt Lymphoma and Primary T-Cell Lymphoma. In contrast, Secondary Breast Lymphoma (SBL) is defined as having a current or previous diagnosis of systemic Lymphoma with subsequent breast involvement. Follicular Lymphoma is characterized by the involvement of follicular B-cells and displays a distinct partial follicular pattern on histology, typically following an indolent course within the lymph nodes, with slow metastasis to distal sites. Diagnosis relies on a multifactorial approach incorporating imaging, core needle or excisional biopsy and immunohistochemical staining. Current treatment options for PBL vary by tumor type and stage, however there are no clear guidelines. Management may consist of a combination of chemotherapy, immunotherapy, radiation, and/or surgery. For indolent tumors, observation may be appropriate, while lower-grade tumors are often managed with localized therapy consisting of surgery and/or radiation. DLBCL is the most common subtype and is the most aggressive form, requiring aggressive treatment with chemotherapy followed by immunotherapy. Follicular Lymphoma is the least common subtype of PBL and given its more indolent course, observation may be appropriate in comparison to systemic therapy. We present a case of Stage III Follicular Lymphoma with secondary breast involvement, along with a review of current literature on treatment guidelines for varying subtypes of Primary Breast Lymphomas. This case emphasizes the importance of individualized treatment strategies and the potential role of a watch-and-wait approach for more indolent tumors.

None Required

Abstract 102

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Identifying Local Breast Cancer Clusters with Novel Hydrologic Modeling Method

Background: Cancer emerges from the complex interplay of a person's genetics and environmental exposures. Environmental drivers of breast cancer in young women (ages 20-49) are particularly unexplored. In Appalachia, the relationships between extraction and chemical industries to environmental carcinogens and subsequent disease processes are understudied in part due to the complexity and scale of analysis.

Methods: We utilized a cluster-identification software tool (envmed) to extract spatial and temporal relationships between disease cases with respect to hydrologic networks. The tool was applied to geocoded breast cancer data from patients ages 20-49 diagnosed at Edwards Cancer Institute (ECI). The patients needed to be located within a 60-minute driving window of ECI

Results: Of 406 young women diagnosed with a breast cancer, 298 were found to have an address within a 60-minute drive of ECI. Using our envmed tool, we identified 23 total breast cancer hydrologic clusters. (rate > national or local average and N > 3 cases) along with the most likely location for water sampling within each cluster to identify a shared exposure.

Future directions: Utilizing this information developed, we will be able to check water samples from these clusters and compare to tissue samples collected during their surgical treatment to determine correlations between environmental toxins and possible breast cancer development.

2287729-1

Abstract 103

~Jones, M¹, Walls, A¹, Kumar, N¹, Muck, T¹, Malone, F¹, Coulter, O¹, Sexton, H^{1,2}, Akter, S¹, Denning, K³, Risher, ML^{1,2}.

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Characterizing Temporal Changes in Excitatory and Inhibitory Synaptic Proximity Across Development in the Ventral Orbitofrontal Cortex

The orbitofrontal cortex (OFC) is a key hub for higher-order cognition. Within the OFC, the ventral subregion (v-OFC) supports task analysis and value assessment. Delayed neuronal maturation in these areas is thought to underlie their vulnerability to alcohol and drug exposure during adolescence. Yet the role of astrocytes, whose peripheral astrocytic processes (PAPs) ensheath synapses and provide critical support during development, remains poorly understood. Our previous work showed that adolescent binge ethanol exposure alters PAP-synaptic coupling and synaptic maturation in OFC subregions of male rats. We hypothesize that the maturation state of the tripartite synapse, and the type of synapse supported by PAPs, predicts vulnerability to alcohol-induced disruption.

To begin addressing this hypothesis, we characterized tripartite synapse maturation in the v-OFC. Male and female C57BL/6 mice were examined at postnatal day (PND) 31 (early adolescence), PND 46 (late adolescence), and PND 72 (young adulthood). Brains were formalin-fixed, paraffin-embedded, sectioned at 5 µm, and processed for immunohistochemistry (IHC). Sections were stained for excitatory and inhibitory synapses and PAPs and imaged using Stimulated Emission Depletion (STED) super-resolution microscopy. Distances between pre-, post-synaptic, and PAP puncta were quantified. IHC data will be presented. Future studies will pair these data with gene expression analyses to define the developmental changes in PAP-synaptic proximity within the v-OFC. This study provides foundational insight into tripartite synapse maturation during adolescence and establishes a framework for understanding why the developing brain is especially vulnerable to alcohol- and drug-induced neurotoxicity.

Abstract 104

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A Peer-to-Peer Support Program for Residents: Addressing Emotional Distress in Graduate Medical Education

Emotional distress is a well-documented challenge within graduate medical education (GME), yet many institutions do not offer structured programs that prepare residents and fellows to effectively support their peers. At the University of Cincinnati, a peer support ambassador program is being developed to address this gap by equipping residents with skills to recognize and respond to distress among colleagues. The program aims to include training in core peer support principles, exercises simulating common interpersonal scenarios, proactive community-building strategies, and guided opportunities for reflection. By cultivating these skills and perspectives, the initiative seeks to promote psychological safety, empathy, and resilience within residency programs. The project is ongoing, with funding and implementation still under development. The long-term objective is to establish an overarching, sustainable peer-to-peer program that enhances resident well-being.

None required

Abstract 105

~Blackburn, N¹, Pallavi F¹, Rupp D¹, Franks A¹, Stickler K¹.

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Every Ankle Pain Is Not an Ankle Sprain: A Case of Missed Talar Neck Fracture.

Talar neck fractures are rare, but they can be debilitating injuries if they are not properly managed. Missing a diagnosis of a talar neck fracture can lead to long term complications such as: avascular necrosis, arthritis, and chronic pain. The risk of sustaining one of these fractures increases with high-energy trauma, hence it's moniker the snowboarder's fracture.

A 24-year-old male sustained a high-impact motorcross accident and was initially misdiagnosed with a lateral ankle sprain. Upon the pain persisting and experiencing a restricted range of motion the patient received further evaluation. Physical exam revealed tenderness over the talar dome. CT imaging confirmed a nondisplaced Hawkins type I talar neck fracture. The patient was directed towards conservative management with non-weight-bearing status for two months. He achieved full resolution of pain and normal ankle mobility.

This case showcases the not only the diagnostic challenge of identifying nondisplaced talar neck fractures, but also the importance of properly diagnosing and treating them. Clinical tools such as the Ottawa ankle rules can help in imaging decisions; however, high-energy trauma and persisting symptoms should point towards additional imaging. Additionally, two classification systems, Hawkins and Malvern, can be utilized to provide guidance for prognosis and treatment.

A high index of suspicion should be maintained in cases of persistent pain following a high-energy ankle trauma. It is essential to obtain timely imaging, proper diagnosis, and proper management to avoid long-term complications.

None required.

Abstract 106

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Longitudinal Analysis of Children Prenatally Exposed to Neuroactive Substances

NAS (Neonatal Abstinence Syndrome) is a common outcome for infant populations affected by the ongoing opioid epidemic following exposure to opioids in utero. Appalachia, specifically West Virginia and other rural Appalachian regions, are shown to be disproportionately affected. The effect the opioid epidemic has had on the Appalachian region led to the expansion of MOUD (medication for opioid use disorder) in the region. Between 2014 and 2016 West Virginia saw a stark increase in the utilization of MOUD, especially Buprenorphine. Thus, we sought to investigate NAS trends in the southern Appalachian region post-expansion of MOUD therapy.

This retrospective study of NAS data from Cabell Huntington Hospital (CHH), a tertiary perinatal center associated with Marshall university serving the tristate area, was derived from the comprehensive data set of all mother-baby dyads that have been admitted to CHH NTU. This data includes the maternal and infant toxicology screening, NAS diagnoses, and demographic characteristics from 2015-2024. The primary outcome measure was the overall incidence/proportion of NAS diagnoses. Secondary outcome measures included stratifying infants with NAS by exposure to prescribed MOUD or illicit Poly-Opioid exposure. The data indicated across this 9-year span a 52.5% reduction in the proportion of NAS cases. The success of MOUD therapy in this population may be depicted through the secondary outcome measure. For example, the data indicates a reduction in the proportion of infants exposed to prescribed MOUD indicating program success in regards to family planning. On the other hand the data showed an increase in the proportion of Poly-Opioid exposed infants as new illicit substances have entered the tri state area

IRB: 1398420-1 IRB1 #00002205 IRB2 #00003206

Abstract 107

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Metabolic Profiling of Orbital Adipose Tissue in TED and the Response to Teprotumumab

Introduction: Thyroid eye disease (TED) involves expansion of orbital fat, leading to proptosis, inflammation, and possible vision loss. Treatment with the insulin-like growth factor 1 receptor (IGF1-R) antibody teprotumumab can be effective in selected patients. However, there are no reliable diagnostic or treatment monitoring biomarkers. In this study we sought to characterize metabolic changes in orbital adipose tissue from TED patients, including those previously treated with teprotumumab.

Methods: Orbital fat specimens will be snap-frozen in liquid nitrogen and stored at –80°C before being profiled by targeted metabolomic LC-MS/MS analysis. Statistical analysis will be performed using partial least squares discriminant analysis (PLS-DA) as well as heat maps, volcano plots, receiver operating characteristic (ROC) curves, and pathway enrichment using MetaboAnalyst6.0.

Results: Orbital adipose tissue samples were obtained from 11 TED patients without prior teprotumumab treatment (TED-NT), 16 TED patients who had prior teprotumumab treatment (TED-T), and 23 controls. 135 metabolites in major metabolic pathways from glycolysis, the citric acid cycle, amino acids, nucleotides, lipids and vitamins were analyzed. PLSDA analysis showed that 37 metabolites significantly changed in TED-NT compared to controls, and 27 were significantly changed in TED-T compared to TED-NT. Pathway enrichment showed TED-NT substantial changed pathways in the Warburg effect, fatty acids, citric acid cycle and amino acids. ROC curve analysis showed carnitine, acylcarnitine and GABA had the highest scores as biomarkers for TED. Importantly, TED-T restores many of the changes particularly in GABA, lysine and nucleotide metabolism.

Conclusion: TED is associated with unique metabolic reprogramming in orbital fat. Teprotumumab treatment partially reverses these metabolic changes. Candidate metabolites may serve as biomarkers to characterize the disease or monitor treatment response.

The study was approved by the Institutional Review Board of West Virginia University and in accordance with the Helsinki Declaration. (Currently waiting for the exact IRB number from WVU Ophthalmology).

Abstract 108

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Optimization of (Dithioperoxo)thiolate-Based Antifungal Agents for Triazole-Resistant *Aspergillus Fumigatus*

The emergence of triazole-resistant *Aspergillus fumigatus* represents a major clinical challenge, underscoring the need for new antifungal strategies. Disulfiram and related analogs have previously shown antimicrobial activity against fungal pathogens, including *Candida albicans*. In this study, we evaluated synthetic antifungal agents derived from a (dithioperoxo)thiolate core. Their efficacy was tested against voriconazole-resistant *A. fumigatus* isolates. Among the compounds examined, thiomethyl-substituted analogs demonstrated the most consistent activity, with MIC values of 1–2 µg/mL across all resistant strains. Time–growth studies further revealed that these agents effectively inhibited spore germination and suppressed early hyphal development in the triazole-resistant strain AR-1295, outperforming voriconazole. Mechanistic studies indicated that interactions with glutathione and copper attenuated activity, consistent with a thiol-reactive, redox-disruptive mode of action. These collective findings revealed (dithioperoxo)thiolates as promising antifungal candidates and highlight their potential as therapeutic leads for drug-resistant aspergillosis.

MU IACUC (protocol #855)

Abstract 109

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Analyzing the Association of Perceived Needs in Expanded School Based Mental Health and County Demographics in West Virginia

Introduction: Expanded school mental health (ESMH) services are implemented in West Virginia (WV) to improve student access to mental health support. Previous research across 20 WV counties found that limited Tier 2 and Tier 3 resources were moderately correlated with higher rates of child poverty. Additionally, low Tier 3 resources were moderately associated with higher teen pregnancy rates. However, how schools prioritize ESMH needs remains unclear.

Methods: ESMH program needs were collected from 55 schools across 20 WV counties through standardized interviews with school officials. Needs were categorized into school designation (elementary, middle, and high schools) and ESMH Tier: Tier 1 (prevention), Tier 2 (early intervention), and Tier 3 (treatment). School officials plotted identified needs on an impact-effort matrix chart using a scale of 1-5, and the differences in the impact and effort of perceived needs by Tiers and school types were assessed using Kruskal-Wallis test and Fisher's exact test. The needs will be analyzed against publicly available demographic data.

Results: The number of perceived Tier 3 needs was observed to be significantly lower than those of Tier 1 and Tier 2 needs ($p < 0.0001$). The average impact of perceived Tier 3 needs was observed to be significantly higher than those of Tier 1 and Tier 2 needs ($p = 0.002$).

Conclusions: While schools identified less Tier 3 needs than Tier 1 and Tier 2 needs, they have a significantly greater impact. Findings can help increase understanding of current ESMH needs across WV schools and improve the assessment process on these services.

2239287-1

Abstract 110

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Nutrition Assessment of Substance Use Population Compared to Control Population

This study aims to evaluate and compare the nutritional status of individuals undergoing treatment for substance use disorder (SUD) with a matched control population. Poor nutrition, micronutrient deficiencies and malabsorption are common in individuals with SUD, potentially affecting recovery outcomes. This study involves collection of biometric data, demographic information, conducting a structured nutrition survey, and performing a one-time blood draw of 35ml to assess key nutritional markers such as lipid panel, folic acid, Vitamin B12, Vitamin D, Thyroid Stimulating Hormone (TSH), Vitamin K, Magnesium, Selenium, Chromium, Zinc, Copper, and Lithium.

While the original protocol was designed to recruit approximately 110 participants across rural and urban populations, for the purpose of my thesis dissertation, data will be analyzed from a subset of 50 participants- comparing 25 individuals with a history of substance use and 25 control participants without substance use history. The rural versus urban comparison will not be included in this thesis-specific analysis. The current submission reflects the continuation of this approved protocol under the thesis dissertation process.

The goal of this thesis project is to identify nutritional disparities between SUD and Control groups, which may provide insights into targeted nutritional interventions that can support overall treatment outcomes for the individuals with substance use disorders.

1975490

Abstract 111

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Posterior Sternoclavicular Dislocation: Rare but Life Threatening

Posterior sternoclavicular dislocations are rare injuries that can potentially lead to life threatening emergencies. This injury typically arises from a high-intensity direct hit to the joint and can result in tracheal, esophageal, and neurovascular injuries.

A 24-year-old male college football player presented with left shoulder pain and reduced range of motion five days after landing on the shoulder during practice. Tenderness to palpation of the Acromioclavicular and Sternoclavicular joints, and a slight SCJ depression was noted. X-rays showed no acute fracture, but the medial end of the left clavicle appeared slightly inferior leading to a computed topography scan (CT), which displayed a left medial clavicular head was posteriorly dislocated by 1.8 cm. A closed reduction was attempted but resulted in an open reduction and repair of anterior supraclavicular ligaments. The patient was discharged after 48 hours and instructed to wear a shoulder sling, perform pendulum/range of motion exercises, and to not perform any cross body/weight bearing activities for 4 to 6 weeks.

While this injury is rare, it is crucial to quickly diagnose to prevent serious complications. An x-ray in a serendipity view can be used for screening, but a CT scan is necessary for confirmation. If diagnosis occurs before 48 hours, a closed reduction should be attempted first. If longer than 48 hours, or injury involves other complications, an open reduction with internal fixation is necessary. As there is no consensus regarding surgical method, or a return to play protocol, advise athletes on their recovery is difficult

N/A

Abstract 112

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Impact of Obesity on Treatment Compliance and Outcomes in Women with Breast Cancer: A Retrospective Study

OBJECTIVE: Obesity (BMI ≥ 30 kg/m²) is a well-established, modifiable risk factor for breast cancer development and progression. However, the specific impact of obesity on treatment outcomes, including compliance with endocrine therapy and recurrence rates in HR+ breast cancer, remains insufficiently studied. This review aims to investigate this relationship, focusing on correlations with treatment compliance, hormone receptor status, comorbidities, tumor characteristics, and recurrence rates.

METHODS: This retrospective study evaluated 420 women (ages 18–80) with breast cancer treated at Cabell Huntington Hospital, Huntington, WV. Data collected included demographics (age, BMI, race, ethnicity, comorbidities), tumor characteristics (stage, receptor status, subtype), treatments, surgery, compliance, and recurrence. Patients lost to follow-up were excluded from recurrence analyses. Statistical comparisons will examine associations between obesity, receptor status, comorbidities, compliance, subtype, staging, and recurrence.

RESULTS: Preliminary data shows a mean BMI of 30.6 (range 22.2–42.7), a mean age of 68 years, and a predominantly White cohort (98%). Nearly all patients had ER+ disease (99.8%), with most presenting at early clinical (76.3% stage I/II) and pathological stages (77.2% stage I/II). Comorbidities were common (70.3%), most frequently hypertension (57.8%), diabetes (19.7%), COPD/asthma (14.9%), and prior malignancy (14.9%). Treatment compliance was 84%, with endocrine therapy accounting for 61% of noncompliance cases. Ongoing analyses will compare obese and non-obese cohorts by tumor features, compliance, and recurrence.

CONCLUSION: Preliminary findings highlight the high prevalence of ER+ tumors and significant noncompliance with endocrine therapy. Further results are expected to clarify obesity-related differences in treatment response and recurrence risk.

Abstract 113

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Evaluation of Tripartite Synapse Maturation using Spatial Transcriptomics

Proper synaptic maturation is vital for optimal cognitive function and brain activity. Many of these synapses are ensheathed by a peripheral astrocyte process (PAP) to form the tripartite synapse. Synaptic transmission is regulated through PAP-synaptic crosstalk involving contact-mediated and secreted factors. However, details regarding the development of these tripartite synapses remain understudied. Our previous studies have demonstrated that the proximity of PAPs and synapses increases across development, and that this maturation process follows a unique developmental timeframe depending on the subregion of the brain. Moreover, alcohol exposure during development (Adolescent Intermittent Ethanol Exposure (AIE)) induces a subregion-dependent loss of PAP-synaptic proximity that persists into adulthood. We hypothesize that the varying subregion-specific maturation states of the tripartite synapse predict vulnerability to AIE-induced loss of PAP-synaptic proximity. Our study focuses on assessing changes in mRNA expression of bridging proteins critical to tripartite synapse stabilization. We used formalin-fixed paraffin embedded brain tissue collected from C57BL/6 mice euthanized at three developmental stages: postnatal day (PND) 31 (early adolescence), PND 46 (late adolescence), and PND 72 (adulthood). One 5 µm section was used for spatial transcriptomics (ST), prepared using Visium HD (10x Genomics). SpaceRanger was used to align the samples to the reference genome and for image processing. We used the R package Seurat for downstream data analysis. The ongoing data analysis will characterize the PAP-synaptic transcriptomic changes during these timepoints to provide context to future studies on the relationship between AIE induced loss of PAP synaptic proximity and the loss of synapse stabilizing proteins.

MU IACUC 843

Abstract 114

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Diagnosis of Late-Onset Pompe Disease in an Adolescent with Severe Scoliosis

Background: Pompe disease (glycogen storage disease type II, GSD-II) is a rare autosomal recessive disorder caused by deficiency of acid α -glucosidase, leading to lysosomal glycogen accumulation. Late-onset Pompe disease (LOPD) typically presents in adolescence or adulthood with progressive limb-girdle and respiratory weakness. Diagnosis is often delayed due to nonspecific symptoms and overlap with more common neuromuscular conditions.

Case Presentation: A 15-year-old female with anxiety/depression and severe scoliosis (59° lumbar curve with rapid progression) was noted to have persistently elevated AST/ALT during preoperative evaluation for spinal fusion. Gastroenterology workup showed normal bilirubin and albumin, but creatine kinase (CK) was markedly elevated. She was referred to pediatric neurology, where genetic testing revealed compound heterozygous pathogenic variants in GAA (c.-32-13T>G and c.2560C>T, p.Arg854*), confirming late-onset Pompe disease.

She was otherwise asymptomatic, denying exertional intolerance, weakness, or cardiopulmonary complaints. Cardiology evaluation demonstrated normal structure and function without evidence of cardiomyopathy. She is scheduled to begin enzyme replacement therapy and continues to follow with a multidisciplinary team.

Discussion: This case highlights an atypical diagnostic pathway for LOPD, identified incidentally through abnormal liver enzymes during surgical clearance. While her severe scoliosis may reflect underlying paraspinal muscle weakness, elevated transaminases were the first clue. These can represent muscle disease rather than hepatic pathology. Recognition of this relationship prompted CK testing and expedited genetic confirmation. Early identification is essential, as initiation of enzyme replacement therapy can slow progression and improve outcomes.

Conclusion: LOPD may present with subtle or incidental findings. In adolescents with unexplained elevated transaminases, clinicians should consider neuromuscular etiologies to enable timely diagnosis and treatment.

None required

Abstract 115

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Investigating the effects of adolescent binge drinking on astrocyte-synaptic structural interactions in the female rat amygdala

Adolescent binge drinking continues to be problematic for public health. Binge drinking during this developmental period increases the likelihood of developing an alcohol use disorder later in life and is associated with the development of mental health disorders that include anxiety and depression. Animal models of binge drinking, adolescent intermittent ethanol (AIE) exposure, demonstrate long-term disruption of neuronal structure and function within the brain. However, the impact of AIE on non-neuronal cells that support synaptic function remains understudied. Peripheral astrocytic processes (PAPs), ensheath synapses, and are essential for maintaining synaptic health. Our previous data shows that AIE drives a loss of PAP-synaptic proximity in a subregion-dependent manner, however the underlying mechanisms remain unknown.

Here we begin to investigate how AIE induces a loss of PAP-synaptic proximity within the amygdala of female rats; a brain region critical for regulating anxiety-like responses. Using a combination of viral techniques, immunohistochemistry, confocal microscopy, and IMARIS analysis, we examine: 1) changes in astrocyte branch characteristics, and 2) determine if changes in astrocyte branching is a consequence of microglial phagocytosis of PAPs.

Using sophisticated 3-D rendering of astrocytes and microglia, this project will begin to unravel the cellular events that contribute to the loss of PAP-synaptic coupling following AIE. Understanding these processes will provide a better mechanistic understanding of how adolescent binge drinking disrupts PAP-synaptic structural and functional interactions that persist into adulthood. These findings will move the field closer to uncovering new therapeutic targets for mitigating the long-term cognitive deficits associated with early-onset alcohol misuse.

VA IACUC R003

Abstract 116

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Structure-Activity Relationship (SAR) Studies identify Region B capsaicin analogs with growth-inhibitory activity in Human Small Cell lung Carcinoma

Purpose of the Study: The long-term research objective of our laboratory is to identify natural phytochemicals that could have potential applications for the treatment of human small-cell lung cancers (SCLC). Specifically, published data from our laboratory shows that capsaicin (the hot and spicy component of chili peppers) potently abrogates the growth and progression of human SCLC in vitro and in vivo. Conventionally, capsaicin is recognized as a powerful pain-relieving agent which is present in many over-the-counter creams and lotions. However, the clinical applications of capsaicin as a viable pain-relieving agent (and an anti-cancer drug) are hindered by its adverse side effects, such as gastric irritation, stomach cramps, and burning sensation. Such drawbacks of capsaicin may be circumvented by the rational design of non-pungent capsaicin analogs with comparable/greater bioactivity than capsaicin. The structure of capsaicin may be divided into three regions: Region A (the aromatic ring), Region B (the amide group), and Region C (the hydrophobic side chain). As a first step, we synthesized a panel of compounds with variations in Region C of capsaicin.

Experimental Procedures: The growth-suppressive activity of these Region C capsaicin analogs was evaluated using an MTT-based screening assay. The results of the MTT assay were confirmed by measuring the pro-apoptotic activity of these compounds. Based on our findings, our hit compounds were “ARVANIL” and “DOHEVANIL”. Using these two compounds as the template, we then sought to design analogs that would have different chemical groups in Region B of the molecule. The growth-suppressive activity of these Region B analogs was measured using an MTT-based screening assay in human SCLC cells. The results obtained from the MTT experiments were verified by soft agar assays and experiments in patient-derived organoids.

Results: SAR studies led to the identification of a panel of synthetic Region B capsaicin analogs with varying growth-inhibitory activity in human SCLC cells. The pro-apoptotic activity of these compounds correlates well with their ability to inhibit the viability of human SCLCs.

Conclusions: The Region B capsaicin analogs may have applications in the therapy of human SCLC. Our future studies will examine the anti-cancer activity of selected Region B capsaicin analogs in vivo.

N/A

Abstract 117

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Retrospective outcome after metacarpophalangeal joint and proximal phalangeal joint semi constrained arthroplasty

Purpose: Treatment options for metacarpophalangeal (MCP) and proximal phalangeal (PIP) joints degenerative changes secondary to osteoarthritis (OA), rheumatoid arthritis (RA) or post-traumatic arthritis remain limited with less than satisfying results. Semi-constrained surface replacement (SR) arthroplasty is useful when other measures have failed despite high complication rates. Outcomes of semi-constrained implants in low socioeconomic populations with limited resources are not well described. This study aimed to evaluate patient reported outcomes, complications and implant survival,

Methods: We performed a retrospective review of electronic medical records of 26 patients who underwent SR MCP and/or PIP replacement between 2016-2025. Patient demographics, post-operative complications and patient satisfaction were reported.

Results:

A total of 25 patients underwent 30 SR MCP and/or PIP arthroplasties. Two patients were lost to follow-up, leaving 28 surgical outcomes available for analysis. Mean pain scores improved significantly from preoperative (mean = 8.09) to postoperative (mean = 2.27, $p < .0002$).

Complications occurred in 14 cases, with stiffness requiring revision being the most common ($n=7$). Out of 55 total implants, 6 were removed.

Conclusions:

Semi-constrained SR arthroplasty of the MCP and PIP joints provided significant pain relief and satisfactory implant survival in this cohort. However, stiffness remains common after finger arthroplasty, emphasizing that it primarily relieves pain rather than improves range of motion, and patients should be counseled accordingly. A larger study is needed to better define complication rates and improve long-term functional outcomes. Understanding these patterns and outcomes are crucial for patient counseling and setting post-operative goals for hand function.

499630-17 and 463451-17

Abstract 118

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Characterizing Astrocyte Morphometric Changes that Occur in Female Rats Using a Model of Adolescent Binge Drinking

Binge drinking in adolescence is a growing health concern that can have long-term consequences on neuronal and cognitive function. A key structure that is affected by adolescent intermittent ethanol (AIE) exposure is the tri-partite synapse. This structure is comprised of a pre- and post- terminal that are ensheathed by peripheral astrocyte processes (PAPs). This ensheathment is critical for the regulation of synaptic activity and neuronal health. Our previous work shows that AIE exposure disrupts proximity of these PAPs to the tri-partite synapse within the male hippocampus; an area of the brain critical for learning and memory processes. However, it is currently unknown how and why PAPs lose proximity to synapses.

In this study, following AIE and a 26-day abstinence period, we used adeno-associated viruses (AAV), immunohistochemistry (IHC), and confocal microscopy to quantify PAP-synaptic coupling and morphometric analysis of astrocytes in the dorsal hippocampus of female rats. Astrocytes underwent 3D reconstruction to assess changes in PAP coupling to synapses and astrocyte branch complexity.

Preliminary findings reveal a significant reduction in PAP-synaptic proximity following AIE that is not driven by a loss of synapses. Branch complexity data will also be presented. We predict that peripheral branch length will be shortened following AIE and this may be occurring due to microglia-mediated engulfment of astrocytic PAPs. Understanding the mechanisms underlying astrocyte branching deficits and tripartite synapse decoupling may provide insights into why AIE results in long-term cognitive dysfunction.

VA IACUC R003

Abstract 119

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Adolescent Ethanol Exposure Alters Astrocyte-Mediated Regulation of Fear Circuits in Female Rats

Adolescent binge drinking is associated with long-term disruption of neuronal and cognitive function. The contribution of non-neuronal cells to these deficits remains understudied, despite increasing evidence that astrocytes critically regulate neuronal and behavioral function. By ensheathing synapses, astrocytes modulate synaptic and circuit activity across the fear circuit. Inhibitory control within this circuit is essential for regulating fear responses and facilitating fear extinction. Prior work demonstrated that adolescent intermittent ethanol (AIE) exposure disrupts peripheral astrocytic process (PAP)–synaptic proximity and impairs fear extinction in female rats, with both effects persisting into adulthood.

In the present study, we examine how AIE alters astrocyte function throughout the dorsal hippocampus (dHipp)–prefrontal cortex–amygdala fear circuit and how these changes contribute to deficits in contextual fear extinction. Female Sprague-Dawley rats were subjected to AIE and received intracranial delivery of hM3Dq(Gq) DREADDs targeted to dHipp astrocytes. In adulthood, animals underwent either contextual fear conditioning or were euthanized for immunohistochemistry (IHC) and confocal imaging. IHC was used to determine how AIE impacts dHipp astrocyte activation and downstream neuronal activity across the fear circuit. Behavioral assays assessed whether restoration of astrocytic Ca²⁺ signaling is sufficient to rescue AIE-induced deficits in fear extinction.

We found that basolateral amygdala astrocytes show reduced responsivity to dHipp astrocyte activation when compared to controls and that astrocyte BLA activation could increase freezing behavior in the CFC. In conclusion, these data demonstrate that activation of astrocytes can modulate the entire mPFC-Hipp-AMG fear network and that their influence is more far-reaching than previously reported.

MU IACUC 843

Abstract 120

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Primary Pulmonary Synovial Sarcoma in an Elderly Cancer Survivor: An Incidental Finding on Routine Surveillance

Background: Primary pulmonary synovial sarcoma (PPSS) is a rare malignant neoplasm, accounting for less than 0.5% of primary lung tumors. It typically presents in young to middle-aged adults with non-specific symptoms and may be radiographically indistinguishable from other intrathoracic malignancies. Diagnosis requires exclusion of metastasis and confirmation by histopathology, immunohistochemistry, and molecular testing.

Case Presentation: An 85-year-old male with muscle-invasive urothelial carcinoma underwent routine surveillance post-chemotherapy and cystectomy seven years prior. Chest CT imaging revealed a 4×4 mm right middle lobe nodule, believed to be incidental. Repeat CT imaging two years later showed enlargement to 7×7 mm. Needle biopsy demonstrated a spindle cell neoplasm with monotonous ovoid to spindle nuclei intermixed with epithelial tumor cells. Immunostaining was unevenly positive for CD99 and diffusely positive for SSX C term. Comprehensive review concluded the neoplasm was most suggestive of synovial sarcoma.

Non-operative treatment was preferred by the patient, who underwent five rounds of stereotactic body radiation therapy with CyberKnife instead of surgery. He is now awaiting surveillance PET scans.

Conclusion: PPSS is a rare, diagnostically challenging tumor requiring high suspicion and integration of clinical, radiologic, histopathologic, and molecular findings. Complete surgical excision remains the mainstay of treatment, with neoadjuvant or adjuvant chemotherapy considered in high-risk cases. Radiotherapy is an effective option for local control in patients who are not surgical candidates or prefer nonoperative management, especially for small nodules. Early recognition and multidisciplinary management are essential to optimize outcomes.

None

Abstract 121

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Diagnostic Utility of AFIRMA Molecular Testing in Thyroid Nodule Assessment in the Context of GLP-1/GIP Receptor Agonist Use: A Case Report

Background:

Indeterminate thyroid nodules present a diagnostic challenge, particularly in patients receiving glucagon-like peptide-1 receptor agonists (GLP-1RAs) such as Tirzepatide (Mounjaro), which carries a boxed warning for medullary thyroid tumors based on rodent studies. The Afirma Genomic Sequencing Classifier (GSC) and Xpression Atlas (XA) are validated molecular tests for risk stratification, reducing unnecessary surgery and guiding management.

Case Presentation:

A 78-year-old female with type 2 diabetes mellitus and obesity presented with thyrotoxicosis symptoms such as heat intolerance, hair loss, and diaphoresis. Thyroid ultrasound revealed a 2.6 cm left thyroid nodule, while uptake scan showed increased focal uptake in the left lobe. Methimazole treatment was initiated, with Tirzepatide started soon after for glucose control and weight loss. The patient had no personal or family history of medullary thyroid carcinoma or MEN2, consistent with FDA contraindications for Tirzepatide. After methimazole treatment, the nodule persisted on repeat ultrasound. Fine needle aspiration biopsy yielded a Bethesda III/indeterminate cytology classification. Afirma GSC molecular testing classified the nodule as benign with a 4% malignancy risk, with XA testing not being done for benign nodules.

The patient achieved remission of diabetes and obesity with continued Tirzepatide usage, and annual ultrasound surveillance was planned.

Conclusion:

This case highlights the utility of Afirma testing in managing indeterminate thyroid nodules, especially in patients with additional risk factors such as Tirzepatide use. Molecular testing enables avoidance of unnecessary surgery and supports active surveillance for benign nodules. Vigilance and close supervision remain essential in patients with thyroid nodules receiving GLP-1RAs.

None

Abstract 122

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Optimizing Triage and Consultation Protocols for Dog Bite Injuries in the Emergency Department

Background: Dog bites may present to the emergency department (ED) as acute medical emergencies and can lead to a wide range of complications including deep tissue injury, infection, and functional impairment caused by nerve damage. Management practices vary significantly including differences in triage, specialty consultation, imaging, wound care, and antibiotic use. This variability may lead to inconsistent care and delays in treatment.

Objective: To comprehensively evaluate current ED management patterns for dog bite injuries. This includes consultation timing, antibiotic use, imaging, wound management, and short-term outcomes with the goal of identifying gaps in care to guide the development of standardized protocols.

Methods: A retrospective chart review is being conducted on patients presenting to the Cabell Huntington Hospital ED from 2019-2024 with dog bite injuries. Data collected includes patient demographics, relevant risk factors, dog breed (if known), inciting incident, wound characteristics, presence of bony injury, imaging, and radiology findings. The time from triage to initiation of specialty consultations (Orthopedics, Surgery, and Pediatrics) is being recorded. Data also includes whether wounds were irrigated and/or closed in the ED or in the operating room (OR), as well as any additional surgical interventions needed. Additionally, antibiotic administration across care settings (ED, inpatient, outpatient), arranged follow-ups, and ED return visits within 7 and 30 days are being tracked including the reasons for the return and any associated complications.

Results: Data analysis is ongoing. Findings will be used to guide protocol development aimed at improving triage efficiency and patient outcomes.

Conclusion: This project aims to reduce variability in the ED management of dog bites by implementing evidence-based triage and consultation pathways that support timely, standardized, and effective care.

None required, QI project

Abstract 123

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Machine Learning-Driven Transcriptomics Analysis for Asthma Mechanism in Latino American Pediatric Cohorts

Background: Asthma is a chronic inflammatory airway disease with a significant health burden in the United States. In 2022, asthma affected 26.8 million people (8.7%) U.S. individuals, with 6.2-8.9% prevalence in children and higher rates in Latino and African American populations according to CDC. Despite advances in genomics, significant gaps remain in understanding the genetic and environmental contributors to asthma pathogenesis. This study uses artificial intelligence (AI) to build prediction models and identify novel asthma biomarkers in Latino American pediatric cohort.

Methods: We preprocessed transcriptomic data from Genes-environments and Admixture in Latino Americans (GALA II) cohort (n=695), constructing gene expression matrices with quality control, filtering and normalization. Differential and pathway analysis were carried out to compare asthmatic patients and healthy controls. Machine learning models such as LightGBM and XGBoost were developed for classification to capture complex, non-linear biological patterns. Feature selection and model evaluation identified candidate biomarkers.

Results: Our analysis revealed 3,904 significant differentially expressed genes (DEGs) between asthmatic and healthy pediatric cohorts, with dysregulations in IL-10, IFN- γ , IL-4 and IL-13 pathways in asthmatic patients. These findings point to mechanisms of airway inflammation, mucus secretion, and impaired viral clearance. In predictive modeling, we used all genes, and DEGs only separately. XGBoost outperformed LightGBM in predictive modeling showing promise for asthma biomarker discovery.

Conclusions: AI-driven multi-omics analysis enhances understanding of asthma's complex biology using population-specific datasets. This research framework demonstrates how combining large-scale omics data with AI methods can enhance our understanding of complex diseases such as asthma.

NA

Abstract 124

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Role of Regulator of G Protein Signaling (RGS6) in Addiction and Pain

Stimulant use disorder (SUD), including methamphetamine addiction, poses a major public health concern, and no FDA-approved pharmacotherapies are currently available. Existing treatments—primarily psychosocial interventions and off-label medications such as selective serotonin reuptake inhibitors, modafinil, and long-acting amphetamines—yield limited efficacy and high relapse rates. This underscores the urgent need to identify novel molecular targets for intervention. One promising candidate is Regulator of G protein signaling 6 (RGS6), which has been implicated in circuits controlling reward, anxiety, and addiction vulnerability.

To investigate its role, we compared RGS6 knockout (KO) and wild-type (WT) mice across several behavioral assays. Reward-related consumption was assessed using two-bottle choice (2BC) paradigms for ethanol, methamphetamine, and sucrose. Operant sensation seeking (OSS) was used to measure motivation for non-drug sensory reinforcement, and cocaine reward was evaluated through conditioned place preference (CPP) in a parallel study.

RGS6 KO mice showed significantly reduced ethanol preference in the 2BC assay relative to WT controls, while methamphetamine and sucrose intake did not differ by genotype. In the OSS task, KO mice exhibited decreased responding for sensory reinforcement, indicating lower overall reward-seeking motivation. Preliminary CPP data further suggest attenuated cocaine preference in KO mice.

To extend these findings, we will perform sign-tracking and goal-tracking assays to determine whether RGS6 deletion alters attribution of incentive salience to reward-predictive cues. Collectively, these results indicate that RGS6 influences both drug- and non-drug reward sensitivity, with selective effects on ethanol consumption and broader reductions in reward-seeking behaviour.

Abstract 125

~Walls, A¹, Jones, M¹, Kumar, N¹, Muck, T¹, Malone, F¹, Coulter, O¹, Sexton, H^{1,2}, Akter, S¹, Denning, K³, Risher, ML^{1,2}

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Tripartite Synapse Maturation across Adolescent Mouse Development within the Lateral Orbitofrontal Cortex

Adolescent development is a critical period of synaptic maturation, necessary for appropriate cognitive development and increased neural efficiency. These synapses, formed by pre- and post-synaptic terminals, will often be ensheathed by a peripheral astrocyte process (PAP), known as the tripartite synapse. Our laboratory has previously demonstrated that adolescent intermittent ethanol exposure (AIE) disrupts the proximity of PAPs and synapses in a subregion dependent manner within the orbitofrontal cortex (OFC), an area of the brain important for higher order cognitive function. This study investigates how temporal maturation of the tripartite synapse within the lateral (lOFC) and ventral (vOFC) subregions of the OFC influences PAP-synaptic proximity changes across adolescence. Mice were sacrificed at three developmental stages: postnatal day (PND) 31, 46, and 72. Brains were collected, fixed, and sectioned for immunohistochemistry (IHC), then imaged via stimulated emission depletion (STED) microscopy to assess PAP-synaptic proximity changes across development. An adjacent section was prepared for spatial transcriptomics (ST) using Visium HD (10x Genomics), allowing overlay of the imaged tripartite synapse and changes in gene expression. The lOFC and vOFC function interdependently but have distinct roles: the lOFC mediates decision making and negative outcome processing, while the vOFC moderates reward processing and sensory information integration. Data pertaining specifically to the lOFC will be presented. Understanding how tripartite synapse maturation develops within this region may reveal why the adolescent brain is particularly vulnerable to alcohol exposure and impairs cognitive processing and decision making later in life.

MU IACUC 843

Abstract 126

*~Hicks, R¹, *Coffman, K¹, *Ross, M¹, Cook, S².

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Distinguishing Eczema from Mycosis Fungoides: A Diagnostic Challenge in Chronic Dermatitis

A 40-year-old male presented with a chronic, pruritic rash involving the trunk and extremities. Skin biopsy and histopathological examination revealed features consistent with eczema, including spongiosis, epidermal hyperplasia, and a perivascular lymphocytic infiltrate. While eczema is a common inflammatory skin condition, its clinical and histopathologic overlap with cutaneous T-cell lymphoma – particularly mycosis fungoides (MF) – necessitates careful diagnostic evaluation. Differentiating eczema from MF is critical, as MF, the most common form of primary cutaneous T-cell lymphoma, may initially mimic benign dermatoses.

Key distinguishing features include the chronicity and progression of lesions, their resistance to conventional eczema therapies, and histopathological findings such as epidermotropism of atypical lymphocytes, Pautrier microabscesses, and monoclonal T-cell receptor gene rearrangements. Accurate distinction between eczema and MF is essential for guiding treatment and prognosis. Eczema typically responds to topical corticosteroids, emollients, and treatment of underlying triggers or secondary infections, whereas MF requires a stage-specific oncologic approach, including phototherapy, topical chemotherapeutics, or systemic agents.

Misdiagnosis may result in delayed initiation of cancer-directed therapy or the inappropriate use of immunosuppression in non-malignant disease. Thus, dermatologists and pathologists must maintain a high index of suspicion and employ a multimodal diagnostic strategy, particularly when evaluating chronic, treatment-refractory, or clinically atypical eruptions.

N/A

Abstract 127

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Sextuple Nuchal Cord Entanglement: A Very Rare Case and Review of Literature

Nuchal cord, defined as the wrapping of the umbilical cord around the fetal neck, is a common obstetric finding typically occurring in 20–30% of deliveries. However, multiple loops of nuchal cord are uncommon, and entanglement exceeding three to four loops is rare. We present a case of a 42-year-old gravida 6, para 3124, whose pregnancy was complicated by six nuchal cord loops, antenatally diagnosed and confirmed intraoperatively, leading to non-reassuring fetal heart tracings (NRFHT) and emergent preterm cesarean delivery at 27.6 weeks. This case highlights the potential hemodynamic impact of extreme nuchal cord entanglement and underscores the importance of heightened fetal surveillance in pregnancies with multiple risk factors.

N/A

Abstract 128

~Burbelo, A¹, Lash, J¹, Murphy, A¹, Voigt, M¹, Bullock, M¹.

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Rheumatoid Arthritis Flare Presenting as PJI with Synovial Next Generation Sequencing Guiding Treatment: A Case Report

A patient with rheumatoid arthritis (RA) experienced a flare that mimicked a prosthetic joint infection several years after undergoing Total Knee Arthroplasty (TKA). She presented with gradual worsening knee pain following discontinuation of her RA medication. Elevated inflammatory markers and an increased synovial cell count were noted, but synovial fluid polymerase chain reaction testing was negative. A nonoperative treatment approach was chosen, and she resumed her RA medication which led to symptom resolution. Next-generation sequencing (NGS) played a pivotal role in ruling out infection and identifying the rheumatic cause of the knee pain, thereby avoiding unnecessary revision surgery. NGS may be a valuable diagnostic tool in clinically ambiguous cases.

IRB approval was not required for this case report.

Abstract 129

~Sherif, JA¹, Sherif, JA², Jarrell, M², Cole, C², Anestis, DK², Rankin, GO².

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In Vitro Dihalobenzene Nephrotoxicity in Isolated Kidney Cells

Bromobenzene and chlorobenzene are widely used industrial intermediates known to cause organ toxicity, including nephrotoxicity. However, limited data exists on how polyhalogenation (substitution with more than one of the same halogen) or mixed-halogen substitution alters their toxicological profiles, particularly in the kidney. This study evaluated the nephrotoxicity of mono-, di-, and mixed-halogenated benzenes using isolated kidney cells (IKCs) from male Fischer 344 rats as the in vitro model. Compounds tested were bromobenzene, 1-bromo-4-fluorobenzene, 1-bromo-4-chlorobenzene, 1-bromo-4-iodobenzene, chlorobenzene, 1-chloro-4-fluorobenzene, and 1-chloro-4-iodobenzene. IKC (~4 million/ml; 3 ml) were treated with DMSO or 0.25, 0.5, and 1.0 mM of a halogenated benzene for 30 or 60 minutes under oxygenated conditions. Cytotoxicity was measured via lactate dehydrogenase (LDH) release and trypan blue exclusion assays. Nephrotoxicity was both concentration- and time-dependent, with higher toxicity observed at increased concentrations and longer exposures. Among the brominated compounds, 1-bromo-4-chlorobenzene was the most nephrotoxic, followed by 1-bromo-4-fluorobenzene, bromobenzene, 1,4-dibromobenzene, and 1-bromo-4-iodobenzene. Within the chlorobenzene group, 1,4-dichlorobenzene showed the highest toxicity, followed by 1-bromo-4-chlorobenzene, 1-chloro-4-fluorobenzene, chlorobenzene, and 1-chloro-4-iodobenzene. These results suggest that the halogen substitution pattern is a critical determinant of nephrotoxic potential in vitro, with specific halogen types significantly influencing renal toxicity. Mixed-halogenated compounds can be as, or more, toxic than their mono- or dihalogenated counterparts, suggesting possible additive or synergistic halogen effects.

Abstract 130

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A Case of Newly Diagnosed Hypertrophic Cardiomyopathy in a 55-year-old man presenting with palpitations

Hypertrophic Cardiomyopathy (HCM) is a genetic myocardial disease often diagnosed between the second and third decades of life. Although, recent data highlights and increasing prevalence among those in their fifth and sixth decades. Here, we present a case of a 55-year-old male who presented to his primary care provider with palpitations and a systolic ejection murmur that was heard on physical examination. Initial Holter monitoring evaluation revealed occasional supraventricular tachycardia. A cardiologist referral was made and at his initial appointment he was started on metoprolol for management of the SVTs.

Echocardiography demonstrated proximal septal hypertrophy with left atrial enlargement, but no significant left ventricular outflow tract obstruction at rest. A subsequent Cardiac MRI confirmed severe asymmetric hypertrophy, chordal systolic anterior motion, and dynamic LVOT turbulence, with preserved systolic function. CT angiography corroborated myocardial hypertrophy and left atrial enlargement. The patient reported no family history of sudden cardiac death or cardiomyopathy, and a 16-panel HCM genetic test was negative. He was diagnosed with functionally NYHA Class I HCM and managed with beta-blocker therapy, statin, aspirin, and an SGLT2 inhibitor. This case highlights the importance of a multimodal evaluation in adults with subtle cardiac symptoms, illustrating that HCM may present later in life even in the absence of a positive genetic test, underscoring the need for careful imaging and arrhythmia monitoring.

case study- none required

Abstract 131

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Idiopathic Eosinophilic Cholecystitis in the Setting of Cholelithiasis: A Case Report and Brief Literature Review

Eosinophilic cholecystitis (EC) is a rare inflammatory disorder defined by >90% eosinophilic infiltration of the gallbladder wall. Clinically, it is often indistinguishable from other forms of acute cholecystitis and is therefore typically diagnosed only after histopathological evaluation. We present the case of a 69-year-old woman who demonstrated symptoms consistent with acute cholecystitis and was subsequently found to have EC. The etiology was considered idiopathic, as she exhibited no peripheral eosinophilia and had no history of parasitic infection or drug exposure. The case highlights the clinical presentation, diagnosis, treatment, and relevant literature regarding the uncommon condition.

No IRB/IACUC approval required.

Abstract 132

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Cervical Paratracheal Bronchogenic Cyst Mimicking Nodal Metastatic Disease in a Colorectal Cancer Patient: Diagnostic Utility of Ultrasound-Guided Fine Needle Aspiration

Bronchogenic cysts are rare congenital lesions, typically identified in childhood but occasionally found in adults as incidental findings on imaging. In oncology patients, these lesions can present a diagnostic challenge due to their potential to mimic metastatic disease. We report a case of a 78-year-old woman undergoing routine surveillance for Stage II colorectal cancer who was found to have a paratracheal cystic lesion suspicious for malignancy. Ultrasound guided fine needle aspiration (US-FNA) targeted posterior to the carotid artery aspirated necrotic material yielding pathognomonic ciliated epithelium without malignancy. Coupled with absent FDG avidity on PET and negative cultures, cytology confirmed a benign bronchogenic cyst, excluding metastasis and preventing unnecessary treatment. This case underscores that cervical bronchogenic cysts are critical malignancy mimics in oncology patients and demonstrates US-FNA's unique utility in obtaining contamination-free diagnostic samples, overcoming limitations of other approaches, to avert intervention risks during cancer surveillance.

N/A

Abstract 133

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Squamous Papilloma of the Esophagus in a Patient With Refractory Gastroesophageal Reflux Disease

We report a case of a 35-year-old woman with persistent gastroesophageal reflux disease (GERD) despite lifestyle modification and medical therapy. Endoscopy revealed a squamous papilloma in the distal esophagus, a rare benign lesion linked to chronic mucosal irritation. The lesion was excised, and histopathology confirmed squamous papilloma without dysplasia. This case underscores the importance of endoscopic evaluation in patients with uncontrolled reflux and highlights the potential link between GERD and benign esophageal neoplasms.

No IRB or IACUC Approval Number

Abstract 134

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Appendiceal Diverticulitis Masquerading as Perforated Acute Appendicitis: Diagnostic Pitfalls With a Potential Computed Tomography Radiologic Clue

We report the case of a 50-year-old man presenting with acute right lower quadrant pain and leukocytosis. Computed tomography suggested acute appendicitis with possible microperforation. Laparoscopic appendectomy revealed diverticulum-like outpouchings, and histopathology confirmed acute appendiceal diverticulitis with periappendicitis.

Appendiceal diverticulitis is an uncommon but clinically significant entity due to its increased risk of perforation and possible association with neoplasia. The clinical and radiologic findings often mimic acute appendicitis, leading to under-recognition without careful review. In our case, a small gas locule seen on CT, initially interpreted as a microperforation, was retrospectively identified as a diverticulum. This finding highlights the potential diagnostic value of intramural gas micro-loculations and a saccular appendiceal contour on CT, particularly when combined with asymmetric periappendiceal fat stranding and wall thickening.

Awareness of these imaging features may aid in distinguishing appendiceal diverticulitis from routine appendicitis, prompting appropriate surgical management and histopathologic assessment. Recognition of this condition is important for timely treatment and for guiding follow-up, given the associated risks.

n/a

Abstract 135

~McCormick, M¹, Ross, M¹, Cole, C¹, Sherif, J¹, Jarrell, M¹, Sherif, J¹, Rose, S¹, Anestis, DK¹, Rankin, GO¹.

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Tribromobenzene Nephrotoxicity in Isolated Kidney Cells from Male Fischer 344 Rats

Previous studies have demonstrated that mono- and dibromobenzenes, used in many commercial products, are toxic to liver and kidney via toxic metabolites. Evidence shows that tribromobenzenes (TBBs) are hepatotoxicants. Little information is known about nephrotoxic potential of TBBs. This study determined the nephrotoxicity of three TBB isomers and explored bioactivity and free radical participation in TBB nephrotoxicity in vitro. Isolated kidney cells (IKC) (~4 million cells/ml; 3ml) from male Fischer 344 rats were incubated with shaking at 37°C under a 95% oxygen/5% carbon dioxide atmosphere with a TBB isomer (0.25, 0.50 or 1.0mM) or vehicle (dimethyl sulfoxide) for 30 or 60 min. Cytotoxicity was measured by trypan blue exclusion and changes in lactate dehydrogenase (LDH) release. In some experiments, IKC were pretreated with antioxidants (glutathione, 1.0mM, 30min; N-acetyl-L-cysteine 2.0mM, 30min, ascorbate, 2.0mM, 5min; or α -tocopherol, 2.0mM, 5min) or a cytochrome P450 (CYP) inhibitor (piperonyl butoxide, 0.1 mM, 15 min) before 1,3,5-TBB (1.0 mM; 60min). Among the TBBs, 1,2,4-TBB induced cytotoxicity at 0.5 mM or greater at 30 min and 0.25 mM or greater at 60 min. 1,3,5-TBB induced cytotoxicity at 0.5 mM or greater at 30/60 min and 1,2,3-TBB induced cytotoxicity at 1.0 mM at 30/60 min. Cytotoxicity induced by 1,2,3- and 1,3,5-TBB (1.0mM, 60min) was attenuated by all antioxidants and the CYP inhibitor. Results indicated that the order of decreasing nephrotoxic potential was 1,2,4- > 1,3,5- > 1,2,3-TBB, and that free radicals affect the nephrotoxic mechanism induced by 1,2,3- and 1,3,5-TBB metabolites.

None Required

Abstract 136

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Understanding and Supporting Food Box Utilization and Nutrition of Huntington Residents Experiencing Housing Insecurity

This research aims to improve the nutrition and overall health of residents at Vanity Fair, a housing community in Huntington, West Virginia, by empowering them through dietary education and increased utilization of food boxes provided by the Facing Hunger Food Bank. Many residents receive food boxes but may not fully use the contents due to barriers such as lack of knowledge on how to prepare certain foods, limited cooking utensils or appliances, or personal preferences. By identifying these barriers and providing tailored educational resources—including a community recipe book featuring recipes that utilize food box items—we hope to enhance the residents' confidence and ability to prepare nutritious meals. This, in turn, may improve their dietary habits, health outcomes, and quality of life. Empowering residents with knowledge and resources can lead to better management of health conditions, increased confidence in cooking, and a stronger sense of community.

Study IRB # 2260029, approved 3/6/2025, unsure where to find approval number

Abstract 137

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Neurocognitive Decline With Ventriculomegaly: Differentiating Normal Pressure Hydrocephalus From HSV-1 Encephalitis

Herpes Simplex Virus type 1 (HSV-1) encephalitis in elderly patients may present with cognitive and behavioral changes rather than classic febrile or focal neurological symptoms, leading to misdiagnosis. We report a 73-year-old female with progressive gait instability, urinary incontinence, and cognitive decline, initially attributed to normal pressure hydrocephalus (NPH) after outpatient imaging showed ventriculomegaly and mild cortical atrophy. Two lumbar punctures produced transient symptom improvement, reinforcing the NPH diagnosis. During hospitalization for presumed shunt placement, the patient developed escalating agitation, paranoia, hallucinations, and disorganized thought processes. Psychiatric consultation identified inconsistencies with NPH, noting the atypical persistence of delirium and poor response to cerebrospinal fluid drainage. Infectious workup revealed cerebrospinal fluid positive for HSV-1 by PCR. Intravenous acyclovir was initiated, resulting in marked cognitive and behavioral improvement.

This case underscores the diagnostic complexity of HSV-1 encephalitis in older adults, particularly when neuroimaging is non-definitive and psychiatric symptoms dominate. Delayed recognition risks significant morbidity and mortality, while timely antiviral therapy can yield substantial recovery. Psychiatric involvement was critical in broadening the differential diagnosis, advocating for targeted infectious testing, and facilitating early treatment. Clinicians should maintain a high index of suspicion for infectious etiologies in elderly patients with atypical neuropsychiatric presentations, even when structural pathology such as NPH appears plausible.

N/A

Abstract 138

*Alzubi, AS, *Abdelaziz, AM, Nounou, MV, Abdelwahed, AF, Perelman, SV, ~Issa, JG; Kassis, A, Elhadi, M, Roy, SA; Carlos Rueda, C; Thompson, EA¹

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Sex Disparities in Mortality and Clinical Characteristics in Patients with Infective Endocarditis: A Meta-Analysis of Reconstructed Time-to-Event Data

Background: Sex disparities in the clinical presentation, management, and outcomes of infective endocarditis (IE) remain inconsistent throughout the literature.

Objectives: We aimed to investigate the prognostic impact of sex-associated disparities in all-cause mortality and baseline clinical characteristics among patients with IE.

Methods: We comprehensively searched PubMed, Scopus, Embase and Web of Science till July 2025 for studies reporting sex-specific data on clinical presentation, mortality and management patterns in IE. We reconstructed individual patient data (IPD) from published Kaplan-Meier (KM) plots for all-cause mortality and estimated HR with 95% CI using Cox regression model. Data regarding clinical presentation, microbiological profile and management were pooled using random-effects meta-analysis.

Results: Eighteen studies comprising 12,594 female and 24,365 male patients were included. Female sex was associated with higher risk of mortality (HR: 1.338, 95% CI: 1.272 to 1.407, $p < 0.001$). Women more often had mitral valve endocarditis and valve vegetations, but less frequently aortic valve endocarditis and intracardiac abscesses. Rates of surgical indication were similar between sexes, yet women underwent surgery less often, coinciding with higher baseline EuroScore II. Enterococcal infections were less common in women, with no significant sex differences for other microbiological etiologies.

Conclusion: Women with IE experience higher mortality than men despite similar surgical indications, alongside distinctive valve involvement patterns, higher baseline surgical risk, and lower surgical intervention rates. Earlier recognition, timely intervention, and optimized surgical decision-making in women may help reduce this disparity.

N/A

Abstract 139

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Ewing's Sarcoma: A Retrospective Pediatric Case Study

Introduction: Ewing's Sarcoma (ES) is a rare cancer that occurs primarily in adolescents, with a peak incidence between 10 and 20 years of age. ES is an aggressive cancer that affects the long bones of the legs and flat bones of the pelvis and chest wall. The purpose of this case study is to highlight a rare cancer that occurs in the pediatric population and detail the patient's unique treatment challenges, along with emphasizing the importance of early recognition.

Case Description: This case involves an 11-year-old male who was diagnosed with ES at 7-years-old when an epidural mass was found compressing the spine. Treatment was conducted both at the Edwards Comprehensive Cancer Center (ECCC) and Nationwide Children's Hospital (NCH), with surgery primarily at NCH. The patient experienced 24 months without disease progression but currently has recurrence of disease. During treatment, the patient has experienced several barriers to obtaining medication that could better treat his disease, which has dictated the course of therapy. In accordance with the guidelines, the patient has been treated with Irinotecan/Cyclophosphamide/Topotecan and Vincristine/Irinotecan.

Discussion: Despite treatment with guideline-approved therapy, the patient has recurrent disease and had surgery with positive margins. In accordance with published studies, the treating physician prescribed palbociclib for the patient in addition to temozolomide, vincristine, and irinotecan. Insurance boundaries have prevented the patient from receiving the addition of palbociclib in a timely manner, ultimately delaying care. This case study offers a unique perspective on a rare cancer type and the respective course of treatment.

No IRB approval was required for this case study.

Abstract 140

*~Fabela, R¹, *Damron, L¹, Werthammer, J¹, Preston, D¹, Ratcliffe, J¹, Butler, K¹, Mudassir, K¹, *Grandinetti, J², *Keaton, A², *Sitler, E².

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Maternal THC use trends in the face of increasing recreational legalization

Marijuana use has increased across many demographics as legalization has spread nationwide. Currently, 45 states have legalized marijuana for medical use, 25 of which have legalized cannabis for both medical and recreational use. One demographic that has seen an increase in THC use is pregnant women.

Research has shown potentially deleterious effects on offspring exposed to THC in utero, including increases in preterm birth, low birth weight, and alterations in the fetal epigenome. Risks extending to childhood include increased rates of ADHD, autism spectrum disorder, behavior/memory dysfunction, and delayed development.

With legalization and use in the pregnant population increasing, this is an important area of research as the full effect of maternal THC use on neonatal health remains unknown and could lead to increasing demand for neonatal care.

The primary objective of this report is to investigate the trend of cannabis use during pregnancy in a region where it has not been legalized. The secondary goal is to examine the prenatal use of other illicit drugs during the same study period.

This is a retrospective chart review of all women at a regional university perinatal center in Huntington, WV, located at the junction of West Virginia, Kentucky, and Ohio where recreational cannabis sales remained illegal during the study period from January 1, 2020, and March 31, 2024. Charts are reviewed for maternal demographics, UDS results at delivery, length of stay, gestational age at birth, birth weight, birth length, BMI, umbilical cord or meconium toxicology, NAS treatment, and length of stay.

Our hypothesis is recreational marijuana use during pregnancy has increased with increasing legalization. We also hypothesize use of other illicit drugs during pregnancy decreased as marijuana use has become more prevalent.

*Data is collected and is in preliminary analysis now.

2133836

Abstract 141

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Pembrolizumab-Induced Colitis with Concurrent Capecitabine in Triple Negative Breast Carcinoma: A Case Report Emphasizing the Importance of Early Colonoscopy and Histopathological Identification and Differentiation

Immune checkpoint inhibitors (ICIs) have revolutionized cancer treatment, but their use is associated with immune-related adverse events (irAEs). Colitis is a significant irAE, particularly with programmed cell death protein 1 (PD-1) inhibitors like pembrolizumab. This case report details a 48-year-old female with triple-negative breast cancer (TNBC) who developed colitis while on pembrolizumab and capecitabine. The patient presented with symptoms including diarrhea and stomatitis, which were initially managed with supportive care. Subsequent investigation with colonoscopy was normal appearing, however, biopsy revealed mild focal active colitis microscopically. This case highlights the importance of early recognition and management of pembrolizumab-induced colitis, especially in patients receiving concurrent chemotherapy, and emphasizes the need to differentiate it from other gastrointestinal issues or other drug-induced colitis such as with capecitabine. This case also adds evidence to help guide early histological identification of ICI-induced colitis, and a comprehensive literature review on pembrolizumab-induced colitis is presented, discussing its incidence, clinical presentation, diagnosis, and management strategies.

No IRB or IACUC due to this being a case study

Abstract 142

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Racial Disparities in Hospitalization Outcomes among Patients with Acute Coronary Syndrome and Acquired Thrombophilia

Background: Acquired thrombophilia, like Heparin-induced thrombocytopenia, antiphospholipid syndrome, and Jak 2 mutation impact inpatient outcomes in Acute Coronary Syndrome (ACS). This study examines the impact of racial disparities on in-hospital outcomes in these patients

Methods: Retrospective cohort analyses were conducted using the National Inpatient Sample (NIS) from 2016 to 2020. Multivariable linear and logistic regression analysis was used to examine the association between race/ethnicity and mortality, elective admissions, length of stay, and total hospital charges.

Results: Our analysis revealed that Blacks (AOR: 0.54; 95% CI: 0.23-0.92) and Hispanics (AOR: 1.74; 95% CI: 1.32-2.45) with ACS and acquired thrombophilia had lower and higher odds of mortality, respectively, compared to their White counterparts. Also, Blacks (AOR: 0.34; 95% CI: 0.10-0.78), Hispanics (AOR: 0.75; 95% CI: 0.32-0.97), and other races/ethnicities (AOR: 0.23; 95% CI: 0.01-0.78) had 66%, 25% and 77% lower odds, respectively, of elective admission relative to the Whites. Furthermore, Hispanics (AOR: 1.23; 95% CI: 1.01-1.87) were more likely to have a longer hospital stay compared to the Whites

Conclusion: Black patients with ACS and acquired thrombophilia had lower odds of mortality compared to their white counterparts, while Hispanics had higher odds of mortality as well as longer hospital stay.

Further studies will be needed to investigate predictors of mortality in this patient population.

None required

Abstract 143

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Mechanistic Aspects of 1,4-Dibromobenzene Nephrotoxicity

Bromobenzenes are widely used in the production of many industrial and chemical products. Human exposure to bromobenzenes can lead to harmful effects on the liver and kidneys. 1,4-dibromobenzene (1,4-DBB) is a chemical commonly used to manufacture these commercial products. 1,4-DBB could be due to its potential ability to be metabolized into reactive metabolites. Reactive metabolites are byproducts of biotransformation that can induce oxidative stress or bind to proteins and enzymes, which lead to cell damage. The purpose of this study was to examine the bioactivation pathway of 1,4-DBB as well as examine how different antioxidants and cytochrome P450 (CYP) inhibitors affect this mechanism. This study was carried out by isolating kidney cells (IKC) from male Fischer 344 rats, treating the IKC (~4 million cells/ml; 3 ml) with 1,4-DBB (0.25, 0.5 or 1.0 mM) or vehicle, and measuring the amount of LDH released at 30 and 60 min as a marker of cytotoxicity. We found that 1.0 mM 1,4-DBB at 60 min produced the most significant cytotoxic effects. Pretreatment studies were conducted with an antioxidant (glutathione (GSH, 1.0 mM) or ascorbate (ASC, 1.0 mM)) or a CYP inhibitor (metyrapone (1.0 mM); piperonyl butoxide (PiBx)) before IKC exposure to 1,4-DBB (1.0 mM) and a 60 min exposure. These studies indicated that both antioxidants provided full protection, while metyrapone, but not PiBx, successfully protected the kidney cells. These results indicate that oxidative metabolites of 1,4-DBB and free radicals play a role in 1,4-DBB nephrotoxicity.

None

Abstract 144

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Polymicrobial purulent pericarditis with gastrointestinal flora and fungal co-infection: a rare case of recurrent tamponade requiring multimodal intervention

Background: Purulent pericarditis is an uncommon but life-threatening condition characterized by pus accumulation in the pericardial space. Prompt recognition and intervention are critical to prevent recurrent tamponade and mortality.

Case Presentation: A 73-year-old male with coronary artery disease and prior PCI presented with chest pain and hypotension two weeks after treatment for acute pericarditis. Echocardiography revealed a large effusion with tamponade physiology, prompting emergent pericardiocentesis. His ICU course was complicated by recurrent effusions requiring repeat drainage and a pericardial window. Cultures grew *E. coli*, *Enterococcus faecalis*, *Streptococcus anginosus*, *Prevotella*, and *Candida glabrata*. Given the GI flora, the work-up included EGD, MRCP, and an HIDA scan, which failed to reveal a fistula or GI source. He later developed a loculated pleural effusion requiring chest tube drainage. The patient received prolonged antimicrobial therapy (vancomycin, aztreonam, metronidazole, micafungin). Follow-up imaging confirmed resolution, and an outpatient colonoscopy/ERCP was planned.

Discussion: This case underscores the importance of considering atypical organisms, including polymicrobial and fungal pathogens, in purulent pericarditis. Gastrointestinal translocation and systemic infection should be explored when unusual flora is identified. Management requires multimodal therapy—urgent drainage, broad-spectrum and antifungal coverage, and surgical intervention for recurrence. Mortality remains high without timely recognition.

Conclusion: Polymicrobial purulent pericarditis with fungal co-infection is exceedingly rare and associated with recurrent tamponade. Clinicians should maintain a high index of suspicion for nontraditional pathogens and abdominal sources when evaluating purulent effusions. Early multidisciplinary intervention is essential to optimize outcomes.

None

Abstract 145

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Beyond Cough and Dyspnea: Pulmonary Langerhan's Cell Histiocytosis Presenting with Pleuritic Chest Pain

Background: Pulmonary Langerhans cell histiocytosis (PLCH) is a rare cystic lung disease affecting primarily adult smokers. It results from clonal mutations in the RAS/MAP-Kinase pathway (rat sarcoma/mitogen-activated protein kinase), most often BRAF V600E, and accumulation of CD1a+/CD207+ dendritic cells. PLCH presentations vary widely, and atypical features may complicate recognition.

Case: A 47-year-old woman with type 2 diabetes, hypertension, and history of heroin use presented with sharp, left-sided chest pain for three days, new onset acute leg pain, and exertional dyspnea without cough or hemoptysis. She is an active one-pack-per-day smoker. Chest CT revealed bilateral upper-lobe opacities, diffuse cystic changes with fibrosis, hilar lymphadenopathy (2.2 cm), and a small pneumothorax. Bone scan showed increased uptake in the right fourth rib. Bronchoscopy was unremarkable; bronchoalveolar lavage was negative for infection. Lung biopsy demonstrated histiocytes, hemosiderin-laden macrophages, rare eosinophils, and fibrosis, with immunostaining positive for CD68, S100(nuclear), CD1a, and cyclin D1, confirming PLCH. She was started on a prednisone 40mg taper and Bactrim prophylaxis for pneumocystis jirovecii. Pathology was sent for BRAF V600E mutation testing. Despite continued smoking, she improved clinically but was readmitted three months later with viral pneumonia, from which she recovered.

Discussion: This case is unique for its atypical presentation with pleuritic chest and leg pain, presence of hilar lymphadenopathy, and increased rib uptake on bone scan suggesting multisystem involvement. Such findings are uncommon in isolated PLCH and broaden the differential to include sarcoidosis, lymphoma, or infection. The patient's comorbidities and ongoing smoking increased her risk of complications, particularly during immunosuppressive therapy. Literature review showed that in surgical lung biopsies performed for diffuse lung disease, PLCH is identified in 4–5% of cases. Patients with PLCH are at higher risk for secondary malignancies, particularly lymphoma and other hematologic cancers.

Conclusion: Clinicians should consider PLCH in smokers presenting with unexplained chest pain and interstitial lung disease characterized by cystic and multinodular opacities. This case demonstrates how atypical features, such as lymphadenopathy and skeletal uptake, can mimic other systemic disorders. Recognition is important due to risks of progressive respiratory failure and secondary malignancies. This case underscores the value of comprehensive evaluation and mutation testing in guiding management.

n/a

Abstract 146

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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 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.

N/A

Abstract 147

Kadiyala, V¹, Willis, J¹, Cuaranta, A², Abdelmasseh, M², Finley, R², Payne, B², Thompson, E², Gusack, M², McCarthy, M¹, Casingal, J², Issa, J², ~Sauls, A², Attal, N², Sanabria, J².

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Artificial Intelligence in Health Care Education: Overview and Consensus for Future Directions

Background. Artificial intelligence (AI) is reshaping healthcare by advancing clinical decision-making, research, and medical education. As digital tools become central to medicine, AI offers opportunities to enhance learning, efficiency, and patient care. Its adoption, however, must balance technology with human expertise to ensure ethical, equitable implementation. This review examines the evolution of AI in healthcare, challenges to adoption, and its role in medical education, while proposing a framework for systematic integration across specialties and training levels.

Methods. A PubMed search using “artificial intelligence,” “medicine,” and “healthcare” identified 11,508 citations. After screening, 1,676 full-text articles were reviewed, and 144 focused on AI in clinical medicine were included. A multidisciplinary team including IT professionals, medical students, research fellows, and surgical faculty synthesized findings.

Results. Evidence demonstrates growing integration of AI into medical education, with benefits across learners and educators. For students, AI tools enhance anatomy and physiology instruction and strengthen diagnostic reasoning skills. Residents use AI to refine syndrome recognition, improve differential diagnosis, and develop targeted therapies. Surgical residents benefit from AI-powered simulators that improve technical performance, including eye–hand coordination. For faculty, AI contributes to optimizing clinical outcomes, reducing healthcare costs, enhancing reimbursement processes, and supporting performance evaluation. Drawing from this evidence, the review proposes a structured framework for systematically embedding AI into both education and practice.

Conclusions. Effective AI adoption requires collaboration and ethical oversight. AI can reduce clinician workload, enhance education, support decision-making, and improve patient care. A study further evaluating AI’s impact on medical education is currently underway.

Not applicable. This project is a literature-based systematic review and did not involve human or animal subjects.

Abstract 148

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Pituitary Abscess in a Patient with HIV and Neurosyphilis Leading to Panhypopituitarism and adrenal crisis

Pituitary abscess is a rare but serious cause of hypopituitarism, particularly in immunocompromised individuals. We present the case of a 28-year-old woman with poorly controlled human immunodeficiency virus, hepatitis C, and polysubstance use, who developed a pituitary abscess in the setting of neurosyphilis. She presented with ocular syphilis and was diagnosed with panhypopituitarism. Despite treatment, she left against medical advice and later returned with adrenal crisis and pneumonia. This case highlights the exceptional rarity and clinical complexity of pituitary abscess occurring in the context of neurosyphilis and acquired immunodeficiency syndrome. It exemplifies the diagnostic ambiguity, the need for high clinical suspicion, and the multifaceted management challenges posed by overlapping infectious and endocrine pathologies in immunocompromised individuals.

No IRB Approval required

Abstract 149

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Fumarate Hydratase-Deficient Uterine Leiomyomas in Appalachian Women: A Case Series Highlighting Cancer Disparities in Underserved White Populations

Uterine leiomyomas affect over 70% of women globally. Despite representing just 1.6% of cases, fumarate hydratase (FH)-deficient uterine leiomyomas are significant for their association with hereditary leiomyomatosis and renal cell carcinoma syndrome (HLRCC). Diagnosis of FH-deficiency requires identifying unique histopathological features and immunohistochemical staining for FH and S-(2-succino)-cysteine (2SC).

Appalachia, home to approximately 25 million individuals across 13 states, has a higher incidence and mortality from certain cancers. Broader health inequities, including limited access to specialist care, may contribute to these disparities. For instance, patients with hereditary conditions often face obstacles to receiving genetic services.

We present a case series of three Appalachian women diagnosed with FH-deficient, 2SC-positive uterine leiomyomas. Patient history, initial presentation, histopathology, and follow up were analyzed within the context of comprehensiveness of care.

Histopathological analysis revealed features such as focal nuclear atypia, bizarre nuclei, and staghorn vessels indicative of FH-deficient uterine leiomyoma. Two patients had significant family histories of cancer and risk factors such as tobacco and narcotic use. While all three patients demonstrated findings that should prompt a genetics referral, only one patient was referred for further analysis.

These cases highlight both the diagnostic complexity of FH-deficient leiomyomas and barriers to genetics-based care in Appalachia. Our findings emphasize the need for increased clinical suspicion for atypical leiomyomas, reflex FH/2SC testing, and equitable access to care for Appalachians. Addressing these gaps may result in improved outcomes for an underserved population.

No IRB or IACUC approval required.

Abstract 150

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Observed Hip-Dominant Strategy Post-ACL Injury and Reconstruction: Evidence of Increased Anterior Pelvic Tilt With On-Board IMU-Based Return to Support Biomechanical Analysis

Objectives: Anterior cruciate ligament (ACL) injuries and reconstructions often lead to altered movements, potentially increasing re-injury risk (Paterno et al., 2017). A novel “fertilized ACL” (fACL) technique utilizes an all-soft tissue quadriceps graft with an all-inside technique, an internal brace (IB), demineralized bone matrix (DBM), and bone marrow concentrate (BMAC). This study examined kinematic differences in patients post-fACL and standard ACL reconstruction versus matched controls. This primary hypothesis was that pelvic tilt would differ between reconstructed patients and controls; the secondary hypothesis was that this constitutes a hip-dominant compensatory strategy.

Methods: 1406 subjects were analyzed: 66 fACL patients (32 males, 34 females; mean age 17.2 ± 2.9 years) assessed 6–12 months postoperatively, and 10:1 matched cohorts of standard ACL reconstructions (330 males, 340 females; mean age 17.9 ± 3.5) and controls (mean age 18.1 ± 2.6). Pelvic tilt during single-leg squats and drop-jump landings was measured with inertial measurement unit-based motion capture (DorsaVi, Melbourne AUS). One-way ANOVA with post-hoc comparisons assessed group differences, reported as mean differences with 95% confidence intervals and adjusted p-values.

Results: fACL patients showed greater anterior pelvic tilt ($9\text{--}15^\circ$; $p < 0.01$), increased hip and trunk flexion ($p < 0.05$), and reduced knee flexion ($p < 0.05$), consistent with a hip-dominant unloading strategy.

Conclusions: After ACL reconstruction, patients adopt protective patterns with excessive anterior pelvic tilt and altered biomechanics. Rehabilitation should target these compensations through neuromuscular training. Longitudinal studies are needed to determine effects on re-injury and osteoarthritis risk.

This study was approved by the Marshall University Institutional Review Board (1932409-4).

Abstract 151

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The Effect of Walking on MCL Stiffness

Background: The MCL plays a vital role in the stabilization of the knee joint and is commonly injured. Its main mechanism of injury is acute valgus loading of the knee. The effects of chronic loading on the MCL have not been well studied. The purpose of this investigation is to study the effects of repeated submaximal loading during walking on the stiffness of the MCL.

Methods: This investigation used a repeated measures design. Several B-mode with Elastography images of both knees were captured prior to and after 15-minutes of walking, the MCL is assessed with the ultrasound imaging. The ultrasound elastography images were imported into Image J to assess the ligament's stiffness during the Valgus stress test. The statistical test that was used, PairT test, to test the difference in the strain on the MCL during the Valgus stress test.

Results: Six participants, without history of knee ligamentous injury, have been included in this study. The MCL relative strain during the knee valgus test was unchanged following the walking bout on either the right (mean difference = 0.05 ± 0.21 , $P = 0.570$) or left (mean difference = 0.07 ± 0.34 , $P = 0.783$) sides.

Conclusion: The results of the current study suggest that the MCL strain did not increase during the Valgus stress test following the 15-minute walk. Ongoing work in this lab suggests that the MCL strain increases during the Valgus stress test. More work is needed to determine the effect of repeated submaximal loads on the MCL.

2303060

Abstract 152

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Knee Medial Collateral Ligament Strain and Stiffness

Background: The medial collateral ligament is one of the most common ligamentous injuries of the knee. The assessment of MCL injuries is performed using the valgus stress test. Injury to the MCL can also be diagnosed using B-Mode ultrasound imaging. Ultrasound strain elastography has been used to determine the stiffness of different tissue types. However, the ultrasound strain elastography has not been used to explore the MCL. The purpose of the current study is to explore the utility of US elastography in determine MCL stiffness during the knee valgus stress test.

Methods: The repeated measures design was used in this investigation. The participant had several B-mode with ultrasound images of both knees made with elastography. The ultrasound images were made before and during performance of valgus stress tests that stress the ligament structures of the medial knee. The ultrasound images were imported into image J for spectral analysis.

Results: The width of the medial joint gap increased during the valgus stress test on the right (mean = 2.87 ± 0.92 mm, $P < 0.001$) and left (mean = 2.81 ± 0.98 mm, $P < 0.001$) knee. The relative strain increased during the valgus stress test in the right knee (0.34 ± 0.54 , $P = 0.035$) The increase on the left side did not reach statistical significance (0.21 ± 0.47 , $P = 0.062$).

Conclusion: The analysis of the ultrasound strain elastography showed that we can detect increased strain within the MCL during the valgus stress test. However, further investigation will need to include injured MCL's.

2303060

Abstract 153

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Na/K-ATPase Receptor Function in the Renal Proximal Tubule: A Novel Mechanism in Nephrolithiasis

Nephrolithiasis is increasingly common and results from both genetic and environmental factors. Integrated omics identified ATP1A1 (Na/K-ATPase (NKA) α 1), as a key susceptibility gene in calcium stone formation and experimental calcium oxalate (CaOx) model revealed defective NKA/Src signaling, but the mechanism remains unknown.

The renal proximal tubule (RPT) function modulates urinary citrate, a key inhibitor of crystallization and hypocitraturia is a well-established risk factor for kidney stones. We hypothesized that NKA/Src signaling activation in the RPT induces hypercitraturia and reduces CaOx stone formation by decreasing the apical membrane abundance of citrate transporter, sodium-dependent dicarboxylate transporter-1 (NaDC-1/SLC13A2)

To test this, we used NKA α 1S/S mice genetically engineered to express a mutated NKA with a high affinity for endogenous cardiotonic steroids (eCTS) to stimulate NKA/Src receptor function with naturally resistant age-matched controls (NKA α 1R/R, male 8-10 weeks). Mutation was confirmed by a left-shift of inhibitory dose-response curve to the CTS ouabain, without changes in total renal NKA activity or NKA α 1 or β 1 protein content but revealed increased phosphorylation of NKA α 1 at Y260 in the renal cortex, consistent with an activation of eCTS/NKA α 1/Src signaling. At baseline NKA α 1S/S mice exhibited significantly higher urinary citrate excretion compared to NKA α 1R/R (16.3 $\pm$ 1.9 vs. 8.1 $\pm$ 1.0 nmol/24h; n=7-10, P<0.0007). Following sodium glyoxylate injection to induce CaOx stones, NKA α 1S/S mice displayed a 50% reduction in CaOx crystal deposition. Mechanistically, we examined membrane NaDC-1/SLC13A2 abundance.

These findings demonstrated eCTS/NKA α 1/Src signaling as a physiological regulator of citrate transport in the RPT and suggest that modulation of this pathway could protect against nephrolithiasis.

IACUC 682

Abstract 154

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Effect of Electron-withdrawing Groups on 1,4-Dichlorobenzene Nephrotoxicity In Vitro

In previous studies, 1,4-dichlorobenzene (1,4-DCB) has been identified as the most nephrotoxic dichlorobenzene among the three dichlorobenzene isomers. It is a common chemical widely used in daily life, such as in mothballs, and is a building block for pesticides in agriculture, which can have a direct effect on human health. Additionally, it can have a significant environmental impact. The purpose of this study was to examine the effects of various electron-withdrawing groups added to dichlorobenzene on 1,4-DCB nephrotoxicity. Compounds tested include 1,4-dichloro-2-nitrobenzene, 2,5-dichlorobenzoic acid, and 2,5-dichloro-acetophenone. Isolated kidney cells (IKCs) from male Fischer 344 rats were incubated with these chemicals (0.25-1.0 mM) or dimethyl sulfoxide (DMSO, vehicle) for 30 or 60 minutes at 37 °C in a 95% oxygen/ 5% carbon dioxide atmosphere. The release of lactate dehydrogenase (LDH) was utilized to determine cytotoxicity. The nitro group is the strongest electron-withdrawing group, and the acetyl group is the weakest electron-drawing group. All the examined electron-withdrawing groups reduced the level of 1,4-dichlorobenzene toxicity. 1,4-Dichloro-2-nitrobenzene caused the least damage to isolated kidney cells, while 2,5-dichloroacetophenone induced the highest toxicity of the tested compounds. These results indicated that the stronger the electron- withdrawing group, the greater the reduction in 1,4-dichlorobenzene nephrotoxicity. These results also support previous findings that 1,4-dichlorobenzene must be oxidized to form a toxic metabolite(s), as oxidation rates would be reduced by the addition of an electron-withdrawing group.

N/A

Abstract 155

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N-Myc Downstream Regulated 1 (NDRG1) is a modulator of the DNA Damage Response in Clear Cell Renal Cell Carcinoma

N-Myc Downstream Regulated 1 (NDRG1) is a stress-response protein involved in cell growth, differentiation, and survival. We published that phosphorylated NDRG1 (Thr346) is significantly increased in clear cell renal cell carcinoma (ccRCC) samples relative to pair-matched normal renal tissue. This phosphorylation is mediated by the mechanistic target of rapamycin complex 2 (mTORC2) pathway. Inhibiting mTORC2 reduced phospho-NDRG1 (Thr346) and induced apoptosis in ccRCC cells. Apoptosis is a critical component of the DNA damage response pathway. Given our data showing that the phosphorylation of NDRG1 is associated with cell stress and apoptosis, we hypothesized that NDRG1 promotes renal cancer cell survival under DNA damage stress. Etoposide is a topoisomerase II inhibitor that induces apoptosis by damaging DNA. We sought to reduce NDRG1 expression as a new approach to increase the apoptotic response to Etoposide. The expression of NDRG1 in the renal cancer cell line (786-0) was significantly higher than a normal renal epithelial cell line (HK-2). Short interfering RNA against NDRG1 reduced (by ~50%) NDRG1 protein expression in 786-0 cells. Etoposide treatment resulted in a concentration- and time-dependent decrease in 786-0 renal cancer cell viability, with a maximal reduction of 68% in cell growth. NDRG1 knockdown cells exhibited enhanced sensitivity to Etoposide, showing an 80% decrease in cell growth compared to controls. These findings suggest that NDRG1 may protect cancer cells from chemotherapy-induced DNA damage. We are currently investigating the role of NDRG1 in cell survival pathways in renal cancer cells.

No IRB or IACUC. This is a cell line study. No patient samples.

Abstract 156

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The Assessment of Anterior Cruciate Ligament Stiffness Using Ultrasound Shear Wave Elastography

Context: Anterior cruciate ligament (ACL) injuries are common among athletes. ACL injuries happen because of excessive knee internal rotation and anterior shear; due to increased strain in the ACL. The purpose of this study is to determine if ultrasound elastography can detect increase strain in the ACL during knee internal and external rotation.

Methods: Ultrasound images of the ACL were taken from both the anterior and posterior aspects of the knee. For the anterior aspect, the knee was in 90°flexion, for the posterior view the knee was in 20°flexion. Images were taken with the ACL in a neutral position, internal and external rotation. Images were taken of both knees. The ultrasound shear wave elastography images were imported into Image J to perform the spectral analysis to measure strain within the ACL. ACL relative strain was calculated dividing the strain in the rotated position by the strain in the neutral position.

Results: Relative strain increased with both knee internal (mean = 1.23 ± 0.04) and external (mean = 1.11 ± 0.06) rotation. A greater increase in relative strain was found with knee internal rotation (mean difference = 0.12, $F(9,1) = 5.177$, $P = 0.049$). No statistical difference was found between the anterior and posterior view of the ACL or between the right and left knees.

Conclusion: The results of this study suggest that ultrasound elastography could be used to assess injury to the ACL. Future work will need to include injured knees

2303060

Abstract 157

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Colo-Salpingeal Fistula and Tubo-Ovarian Abscess as Rare Complications of Sigmoid Diverticulitis: A Case Report

This case report describes the presentation and management of a 43-year-old G1P1 female with a chronic tubo-ovarian abscess (TOA) complicated by extensive sigmoid colon involvement. The abscess was refractory to multiple courses of antibiotics and percutaneous drainage attempts. The patient presented with lower abdominal pain, fever, and decreased drain output. Imaging revealed a large left pelvic mass with dense adhesions to the rectosigmoid colon. Surgical management consisted of robotic total laparoscopic hysterectomy, bilateral salpingectomy, left salpingo-oophorectomy, extensive lysis of adhesions, and robotic-assisted sigmoid colon resection with reanastomosis. This case underscores the diagnostic and therapeutic challenges of chronic, complicated TOA with bowel involvement. It further highlights the importance of a multidisciplinary surgical approach when conservative measures fail, with the successful outcome demonstrating the efficacy of comprehensive operative intervention in complex pelvic inflammatory disease.

IRB or IACUC approval was not required for this case report.

Abstract 158

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Effect of Electron-donating Groups on 1,4-Dichlorobenzene Nephrotoxicity in Vitro.

Chlorinated aromatic compounds are common environmental and industrial chemicals with variable nephrotoxic potential influenced by their substituent groups. This study investigated the nephrotoxicity of three chlorinated compounds: 1,2,4-trichlorobenzene (1,2,4-TCB), 2,5-dichlorophenol (2,5-DCP), and 2,5-dichloroanisole (2,5-DCA), focusing on the role of electron-donating substituents on their nephrotoxic potential. Isolated kidney cells (IKCs) (approximately 4 million cells/mL; 3mL) from male Fischer 344 rats were exposed to dimethyl sulfoxide (DMSO) or 0.25, 0.5, or 1.0 mM of each compound, for 30 or 60 minutes at 37 °C with shaking under oxygenated conditions. Cytotoxicity was determined by measuring lactate dehydrogenase (LDH) release. Among the compounds tested, the decreasing order of nephrotoxicity was 2,5-DCP > 1,2,4-TCB > 2,5-DCA. This conclusion was based on the time and concentration cytotoxicity induced by the three compounds. These compounds are all derivatives of 1,4-dichlorobenzene (1,4-DCB), and the hydrogen atom at the 2 -position results in a compound that is more nephrotoxic than the 2,5-DCA, yet less toxic than 2,5-DCP and 1,2,4-TCB. This trend highlights how the type and position of substituent groups can influence cytotoxicity. These findings suggest that, in general, electron-donating groups may enhance nephrotoxicity, possibly by facilitating metabolic activation or formation of reactive intermediates with the exception being the methoxy group, which reduced cytotoxicity.

NIH Grant: P20GM103434

Abstract 159

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Applying STEADI for Safer Aging: Fall Risk Reduction in Appalachian Communities.

Background: Falls are a leading cause of morbidity and mortality among older adults. Appalachian populations face elevated risks due to socioeconomic disadvantage, chronic disease burden, and limited healthcare access. This study examined the effects of a 4-week functional exercise program on fall risk outcomes among community-dwelling Appalachian older adults.

Methods: Twelve adults aged 65 and older were recruited from Cabell County Community Services Organization centers in Huntington, WV. Following Marshall University IRB approval, participants completed a 4-week exercise program (Single Leg Stance, Tandem Walk, Sit-to-Stand, Heel Raises, Side Leg Raises, Step-Ups) three times per week. Pre- and post-intervention outcomes included the 30-Second Chair Stand, BERG Balance Scale, Performance-Oriented Mobility Assessment (POMA), Timed Up and Go (TUG), and gait speed. Paired t-tests assessed significance, and Cohen's d estimated effect sizes.

Results: Significant improvements were observed in balance outcomes. BERG scores increased (Mean difference = +2.91; $t(11) = 4.70$; $p < .001$; $d = 1.36$), and POMA scores improved modestly (Mean difference = +0.66; $t(11) = 2.21$; $p = .049$; $d = 0.65$). Gait speed improved by 0.10 m/s ($d = 0.39$) but was not statistically significant ($p = .21$). No meaningful changes were found for the 30-Second Chair Stand ($p = .86$) or TUG ($p = .65$).

Conclusions: A brief, community-based exercise program enhanced balance in Appalachian older adults, suggesting potential as a scalable strategy to reduce fall.

Clinical Relevance: Integrating low-cost, evidence-based mobility exercises into Appalachian community centers may help clinicians and health providers address fall prevention in underserved populations.

(IRB # 2275556-2)

Abstract 160

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The Relationship Between Pectoralis Minor Stiffness and Glenohumeral External Rotation

Background: External glenohumeral rotation at 90 degrees can sometimes provide pain for certain people, particularly those who utilize overhead motions consistently. This pain can prevent daily activities and possibly require medical diagnosis and treatment. The cause of this shoulder pain is typically linked to reduced glenohumeral external rotation. The purpose behind our current study is to assess the relationship between pectoralis minor stiffness and glenohumeral external rotation.

Methods: This study utilized multiple measurements in assessing participants shoulder mobility as well as scapular mobility. Patients' scapulas were monitored in glenohumeral external rotation using electromagnetic tracking. While attached to these tracking systems, ultrasound elastography images were taken to compare the scapula's movement and the pectoralis minor stiffness at the same time.

Results: Ten participants without a history of shoulder pain participated. The pectoralis minor relative strain increased with shoulder external rotation on the left side (mean difference 24.98 ± 23.83 , $P = 0.009$) but the right side did not reach statistical significance (mean difference 19.83 ± 30.37 , $P = 0.069$). There was a weak negative correlation between glenohumeral external rotation and relative strain ($R = -0.337$, $P = 0.414$)

Conclusion: The current data suggest that participants who have increased stiffness in the pectoralis minor have decreased glenohumeral external rotation. This correlation suggests that pectoralis minor stiffness may be contributing to shoulder pain. The limited sample size of this investigation calls for continued exploration

2306652

Abstract 161

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The Relationship Between Pectoralis Minor Stiffness and Anterior Head and Shoulder Posture

Background: Anterior shoulder pain has been attributed to several muscles in the shoulder and trunk. The purpose of this study is to determine the correlation between anterior shoulder and head posture with shoulder stiffness of the pectoralis minor. By establishing this relationship, medical practitioners can better advise individuals with anterior shoulder and head posture on preventing shoulder pain.

Methods: Subjects underwent multiple measurements and assessments to evaluate posture and pectoralis minor stiffness. A clinical assessment was used to determine head posture. The anterior acromion-to-wall distance was measured with a ruler to assess shoulder posture. To measure the pectoralis minor, a digital caliper was used to determine length, and ultrasound elastography was used to assess stiffness. Muscle stiffness was assessed using ultrasound elastography. A paired t-test was used to test differences in head posture groups for pectoralis minor length and stiffness.

Results: Patients with clinically assessed anterior shoulder posture had greater acromial distance than those with neutral head posture. The pectoralis minor length was shorter in participants with forward shoulder posture; however, these differences did not reach statistical significance on the right (mean difference $8.8 \pm 7.0\text{mm}$, $P = 0.242$) and left (mean difference $9.6 \pm 6.4\text{cm}$, $P = 0.168$) sides. The relative strain in the pectoralis minor was not different between the groups.

Discussion: This data suggests the hypothesis that individuals with anterior shoulder and head posture display shorter pectoralis minor length. Lack of statistical differences due to low sample size.

2306652

Abstract 162

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Effects of Pectoralis Minor Length on Scapular Kinematics

Background: Shoulder pain has been correlated to scapular kinematics, more specifically, reduced scapular motion during elevation has been shown to be related to shoulder pain. Pectoralis minor length has also been associated with anterior shoulder pain. However, the association between pectoralis minor length and scapular kinematics has not been fully explored. This lack of data has prompted this study to explore the effects of pectoralis minor length on scapular kinematics.

Methods: The devices this study used to obtain the required measurements included a digital caliper and an electromagnetic tracking system. The digital caliper was used to measure the subjects' pectoralis minor length, and the electromagnetic tracking system was used to measure the scapular position during arm elevation at 30°, 45°, 60°, and 90°. To analyze the data, a two-way repeated measures ANOVA (group by arm elevation).

Results: Participants experienced a pattern of scapular upward rotation, and posterior tilt during arm elevation scapular external rotation was not changed ($P > 0.05$). There was not a difference between the group with shorter and longer pectoralis minor length and scapular upward rotation ($P > 0.05$). The group with shorter pectoralis minor length had less scapular posterior tilt at the 45° (mean difference = $2.9 \pm 4.6^\circ$, $P = 0.007$) and 90° (mean difference = $3.6 \pm 5.1^\circ$, $P = 0.041$) arm elevation angles.

Discussion: The group with shorter pectoralis minor length had less scapular posterior tilt, that is consistent in patients with anterior shoulder pain. A larger sample size is called for.

2306652

Abstract 163

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AKT Serine/Threonine kinase 1 (AKT1) regulation of N-Myc Downstream Regulated 1 (NDRG1) in clear cell renal cell carcinoma cells.

Clear cell renal cell carcinoma (ccRCC) is the most common and aggressive type of renal cancer. N-Myc Downstream Regulated 1 (NDRG1) is a phospho-protein that we recently published and is overexpressed in clinical ccRCC samples relative to pair-matched normal renal tissue. We also published that mechanistic target of rapamycin complex 2 (mTORC2) signaling mediated 100% of the phosphorylation of NDRG1 on Threonine 346 (Thr346). We hypothesized that mTORC2 indirectly phosphorylates NDRG1 (on Thr346 and Serine 330) by stimulating AKT. Our objective in this study was to show that inhibiting AKT reduced the phosphorylation of NDRG1 and that AKT binds to NDRG1 in ccRCC cancer cells. Our results showed that the AKT inhibitor capivasertib (AZD5363) reduced (by ~ 90%) the phosphorylation of NDRG1 on Thr346 and Ser330. We also demonstrated targeting AKT expression with short interfering RNA significantly reduced NDRG1 phosphorylation at Ser330 (by ~100%) yet had little effect on the phosphorylation of Thr346. Coimmunoprecipitation (Co-IP) experiments suggest that endogenous AKT does not bind directly to NDRG1. Collectively, these data show that AKT is the primary kinase that mediates the phosphorylation of NDRG1 on Ser330 downstream of mTORC2 signaling. The lack of direct binding between AKT and NDRG1 indicates that AKT indirectly promotes the phosphorylation of NDRG1. The AKT inhibitor used in this study is approved for breast cancer. Thus, our finding that capivasertib blocks NDRG1 phosphorylation in renal cancer could foster new therapeutic approaches.

No IRB needed. This was a cell line study. And no clinical samples were used in the study.

Abstract 164

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Catecholaminergic Crisis Following Low-Dose Dexamethasone Suppression Test: A Rare Presentation of Pheochromocytoma

We report the case of a 36-year-old woman with a history of hypertension, episodes of sinus tachycardia and refractory anxiety disorder who presented to the emergency department with acute palpitations, chest discomfort and shortness of breath. After an overnight low-dose (1 mg) dexamethasone suppression test for evaluation of suspected hypercortisolemia or catecholamine excess for her chronic symptoms, the patient developed symptoms on the following morning when she presented for blood collection. In the emergency department, she was found to have markedly elevated blood pressure, mildly elevated troponins, and a left adrenal mass on CT abdomen. Further lab work and imaging confirmed the diagnosis of pheochromocytoma. She was stabilized on alpha-adrenergic blockade and subsequently underwent successful laparoscopic adrenalectomy, with resolution of symptoms and normalization of catecholamine levels. To our knowledge, this is the first reported case of pheochromocytoma crisis triggered by a 1 mg dexamethasone suppression test.

N/A

Abstract 165

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Hypoglycemia Associated with Trimethoprim/ Sulfamethoxazole Therapy - A rare case

Introduction: Trimethoprim-sulfamethoxazole (TMP-SMX) is a commonly prescribed antimicrobial agent and is well tolerated in the majority of the patients, but it is associated with rare yet serious adverse effects. One such effect is hypoglycemia, which occurs due to TMP-SMX's sulfonylurea-like action.

Case Presentation: We present a case of a 49-year-old female with a history of hypertension, migraine, and anxiety/depression who experienced multiple syncopal episodes due to severe hypoglycemia likely induced by TMP-SMX use. She was monitored for 48 hours and hypoglycemia resolved. She was discharged home and advised not to take Trimethoprim-sulfamethoxazole in future.

Clinical course: Patient presented to the emergency department after she fell on the floor, her daughter helped her to stand up, gave her some water. She had a syncopal episode at workplace later and multiple falls over 1 week course and was brought to the hospital. In the emergency room her blood glucose was 34, normal kidney function. Urinalysis was normal. Computed tomography of head revealed no acute intracranial pathology. She was started on TMP-SMX, and she reported was taking till three days prior to the hospital admission. She denied taking insulin or sulfonylureas. Blood glucose was monitored every 2 hours without dietary restrictions. She didn't have any further episodes of hypoglycemia during the next 48 hours. Conclusion: This case underscores the importance of recognizing the rare but significant side effect of hypoglycemia linked to TMP-SMX, particularly in patients with no apparent risk factors. A thorough medical history and careful medication reconciliation are essential for diagnosis and preventing unnecessary investigations.

N/A

Abstract 166

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Trends in Substance Use Among Trauma Patients in Rural West Virginia: A 2023-2025 Cross-Sectional Analysis

Background: Rural West Virginia remains a focal point of the national substance use crisis, with substance-related trauma imposing significant burdens on emergency and inpatient services. This study updates a prior 10-year analysis (2006-2016) by evaluating trends in substance use among trauma patients using the latest data.

Objective: To assess the current prevalence of substance use among trauma cases in a rural West Virginia hospital system.

Methods: A retrospective review was conducted of trauma patients aged ≥ 16 years who presented to St. Mary's Medical Center between January 1, 2023 and December 31, 2024. Data included demographics, trauma type, UDS results, and ethanol levels. Statistical analysis was conducted in Python ($p < 0.05$).

Results: A total of 1,420 of 2,538 trauma patients had a UDS, of which 912 (64.2%) returned at least one positive result. This is indicative of a significant decrease in UDS and ethanol positivity rates over time (68.1% vs 64.2%; $p = 0.0052$), with sustained high rates of overall. Opiates, alcohol, and cannabis remained the most frequently detected substances in tested patients at 29.5%, 19.4%, and 18.9% respectively. Cannabis use increased from 13.9% to 18.9% ($p = 6.0 \times 10^{-10}$), while benzodiazepine use decreased from 24.4% to 8.5% ($p = 3.0 \times 10^{-67}$). Additionally, UDS testing frequency has decreased significantly (55.9% vs 67.6%; $p = 2.1 \times 10^{-29}$).

Conclusion: This analysis demonstrates a modest but significant decline in overall toxicology positivity and testing frequency among trauma patients in rural West Virginia compared to the prior decade. Despite this decline, substance involvement remains highly prevalent, with opiates, alcohol, and cannabis continuing to dominate positive screens. The rise in cannabis positivity alongside the sharp reduction in benzodiazepine detection highlights evolving substance use patterns with important clinical and public health implications.

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Abstract 167

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Seronegative Autoimmune Encephalitis Presenting with Severe Neuropsychiatric Symptoms in an Older Adult: A Case of Diagnostic Complexity

Autoimmune encephalitis (AE) is a potentially reversible cause of neuropsychiatric decline, but diagnosis is difficult when serologic markers are absent. We present a 68-year-old man with no psychiatric history who experienced recurrent episodes of acute cognitive and behavioral changes. During his most recent presentation, symptoms included confusion, disorganized thought, visual hallucinations, orofacial dyskinesia, and expressive/receptive aphasia. Extensive workup—including brain MRI, CSF analysis, and autoimmune panels—was unrevealing. Notably, he had a similar episode 16 months prior that improved with corticosteroids. During this admission, trials of antipsychotics and anxiolytics failed to yield benefit.

Given the abrupt symptom onset, movement abnormalities, poor response to psychotropics, and previous steroid responsiveness, seronegative AE was strongly suspected. Psychiatry recommended transfer for advanced testing and empiric immunotherapy.

This case highlights the diagnostic challenge of seronegative AE, particularly in older adults with new-onset psychiatric symptoms. Despite negative imaging and laboratory results, AE should remain a key consideration when clinical features—such as resistance to standard psychiatric treatments and prior steroid responsiveness—are present. Early involvement of psychiatry was critical in identifying the autoimmune etiology.

According to current criteria, empiric treatment may be appropriate even in the absence of serologic confirmation. Delayed recognition can lead to irreversible neurological damage. This case emphasizes the importance of interdisciplinary collaboration and maintaining clinical suspicion for AE despite inconclusive diagnostic studies.

IRB approval was not required for this single-patient case report, as it does not meet the definition of human subjects research per institutional guidelines.

Abstract 168

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Abdominal Abscess Post-Splenic Embolization in a Patient with Decompensated Cirrhosis

Introduction: Partial splenic embolization (PSE) is a minimally invasive treatment option for cirrhosis-related thrombocytopenia but carries risks such as infarction, abscess, and portal vein thrombosis. We report a rare case of intra-abdominal abscess following PSE in a patient with decompensated cirrhosis.

Case Description: A 44-year-old male with decompensated cirrhosis due to Hepatitis C and IV drug use, complicated by esophageal varices, underwent elective PSE in January and February 2025 for hypersplenism-related pancytopenia.

Weeks later, the patient was readmitted with abdominal pain, distension, and dyspnea. On paracentesis, ascitic fluid was culture negative. Despite broad-spectrum antibiotics (meropenem and vancomycin), neutrophilia and symptoms of spontaneous bacterial peritonitis (SBP) persisted.

Worsening symptoms prompted further workup and CT imaging revealed a large intra-abdominal fluid collection with gas inclusions, thought to have evolved from necrotic splenic tissue from the PSE procedure. Interventional radiology performed percutaneous drainage and infectious disease was consulted for antibiotic regimen adjustment. 16S rRNA PCR testing identified *Robinsonella peoriensis*, a rare anaerobe found in humans. Targeted antibiotic therapy and CT-guided percutaneous drainage yielded significant clinical improvement and the patient was discharged accordingly.

Discussion: Intra-abdominal abscess after PSE is an uncommon but serious complication in cirrhotic patients. Persistent culture-negative neutrophilic ascites should prompt further evaluation. This case highlights the diagnostic value of molecular techniques like 16S rRNA PCR and the importance of timely drainage and antimicrobial therapy in managing post-PSE infections.

IRB approval was not required for this single-patient case report, as it does not meet the definition of human subjects research per institutional guidelines