MARSHALL UNIVERSITY

JOAN C. EDWARDS SCHOOL OF MEDICINE

PRESENTS

THE 36th ANNUAL MARSHALL UNIVERSITY HEALTH SCIENCES RESEARCH DAY

November 01, 2024

This event is supported annually by educational grants from the following Endowments:

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Disclosure of Conflicts of Interest

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

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.

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Accreditation Statement:

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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.

2024 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.

36th Annual Research Day

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

Disclosure of Conflicts of Interest
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Accreditation Council for Continuing Medical Education

PLANNING COMMITTEE - NO CONFLICTS INDICATED

Uma Sundaram, MD, Conference Chair, Vice-Dean, Research and Graduate Education
Philippe Georgel, PhD, Professor of Biological Sciences, Director, Office of Student Research
Mindy Varney, **PhD** Assistant Professor, School of Pharmacy
Richard Egleton, PhD, Assistant Dean, Biomedical Research Graduate Programs
Usha Murughiyan, MBBS Medical Director for Clinical Trials
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STAFF COORDINATORS – NO CONFLICTS INDICATED

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Marshall University

36th Annual Health Sciences Research Day

Friday, November 01, 2024

Marshall University Medical Center

Schedule of Events

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

7:45 a.m. Welcome & Opening Remarks
Uma Sundaram, MD, Vice Dean & Research Day Chair
President Brad Smith, Marshall University

8:00 a.m. Oral Session 1 Chair Krista Denning, MD

9:15 a.m. Coffee Break

9:30 a.m. Oral Session 2 Chair Jim Denvir, MD

Time	Name	Title	Page
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9:45	Ethan Bowens	The Effects of aging and sex effects on muscle size in male and female rats	19
10:00	Zakaria Alagha	Pulmonary Hypertension Registry for Surveillance and Evaluation at Marshall University (PULSE-M)	20
10:15	Rebecca Hicks	Evaluating the preservation and quantification of three viral RNA pathogens From a Collection and Transport System for Rapid Point-of-Care Diagnostic Tests	21
10:30	Eliane Tsopmegha	Clostridioides difficile toxin A regulates SGLT1 function and expression in intestinal epithelial cells	22

10:45 a.m. Introduction Avi Mukerjee, Provost

11:00 a.m. **Introduction of Keynote Speaker:** Uma Sundaram, MD, Vice Dean & Research Day Chair

11:15 a.m. **Keynote Speaker:** Dr. Gary Desir**,** Chair of the Department of Internal Medicine at the Yale University School of Medicine

Renalase: A Multi-Functional Signaling Molecule with Roles in Gastrointestinal Disease

12:15 p.m. -1:30 p.m. Lunch and Poster Session -1

1:30 p.m. Oral Session 3 – Richard Egleton, PhD

Time	Name	Title	Page
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1:45 p.m.	Chance Anderson	Characteristics of People Who Achieve Acceptable Symptom State after Total Hip Replacement	25
2:00 p.m.	Alex Simpkins	AKT Serine/Threonine Kinase 1 (AKT) phosphorylates N-Myc Downstream Regulated 1 (NDRG1) on Threonine 346 and Serine 330 in clear cell renal cancer carcinoma cells	26

2:15 p.m. – 3:30 p.m. Coffee and Poster Session 2

4:00 p.m. Award Ceremony

Gary V. Desir, M.D.
2024 Research Day Keynote Speaker
11:00 AM- Harless Auditorium

Gary V. Desir, M.D. is currently the Paul B. Beeson Professor of Medicine as well as Chair of the Department of Internal Medicine at the Yale University School of Medicine, the Vice Provost for Faculty Development and Diversity, Professor at the Yale school of Forestry and Environmental Studies, as well as a physician-scientist and co-founder of the Minority Organization for Retention and Expansion group.

Dr. Desir has contributed groundbreaking discoveries in his career through the detection of voltage-gated potassium channels contributing to the regulation of body weight and insulin sensitivity. Dr. Desir also uncovered a new growth factor which he named, “renalase.” It was also discovered that the renalase growth factor can lead to abnormal functions that relate to the possible development of cancers.

The findings of Dr. Desir’s research have led him down the path of drug research and development that can treat those cancers through blocking the action of renalase in the cancer cells.

The research that he has conducted throughout his career has been funded by the National Science Foundation, National Institutes of Health, Department of Veterans Affairs, American Heart Association, and the Robert Wood Johnson Foundation.

While Dr. Desir holds many positions and titles, his passion has also contributed to one more title, inventor. Dr. Desir holds patents due to his discovery of renalase and the uses of said discovery. The therapies created with renalse led to the founding of two bio-technology companies in which development of renalase-based therapies is there focus.

Dr. Desir continues his research and passion for inclusivity throughout Yale University.

Oral Session 1 8:00 AM – 9:15 AM

***Adeshina D[1], *Hammers G[1], *Hill SP[1], Tetteh-Quarshie S[2], Olszewski NA[2], Sword KM[2], Grooms M[2], Stracula H[2], and Henderson BJ[2].**

[1]Medical Student, Joan C. Edwards School of Medicine; [2]Biomedical Sciences Department, Joan C. Edwards School of Medicine

Impact of chemical flavorants on nicotine reinforcement-related behavior in an adolescent mouse model of vaping self-administration.

Electronic nicotine delivery systems (ENDS) are unique from combustible cigarettes due to the availability of flavor options which make these devices popular among adolescents. Prior preclinical investigations have determined that menthol and green apple flavors can enhance nicotine reward and reinforcement by directly modulating dopamine neurons in reward-mediating brain areas. In this study, we investigated the impact of vanilla (vanillin and ethyl vanillin) and cherry (ethyl vanillin, vanillin, ethyl acetate, ethyl maltol, and maltol) flavors on reinforcement-related behavior with and without nicotine. Male and female adolescent C57BL/6J mice were used in an e-Vape® self-administration (EVSA) assay. We observed that zero-nicotine vanilla-flavored ENDS produced reinforcement-related behavior in adolescent male and female mice. We observed that vanilla plus nicotine did not produce an enhancement in nicotine reinforcement-related behaviors. Additionally, we observed that nicotine decreased the reinforcement-related behavior of vanilla-flavored e-liquids. We also observed that zero-nicotine cherry-flavored ENDS did not produce robust reinforcement-related behavior when compared to control vapor. When cherry flavor was combined with nicotine, mice were observed to have a decrease in reinforcement-related behavior when compared to cherry alone. These data provide additional evidence that some chemical flavors promote vaping-related behaviors without the inclusion of nicotine.

MU IACUC # 664

Funding: R01 DA050717 (to BJH)

*Equal First Authors

Olszewski NA, and Henderson BJ.

Biomedical Sciences Department, Joan C. Edwards School of Medicine

Interpeduncular Nucleus Excitability and the Contributions of Sex and Nicotine Dosage

Significance: The interpeduncular nucleus (IPN) is a brain region heavily involved in nicotine use and dependence. Specifically, the IPN is associated with the aversive circuit of nicotine dependence and is largely associated with nicotine withdrawal-related symptoms. However, how excitability in the IPN is altered as a result of nicotine self-administration is understudied. Further, documentation of sex-specific differences in excitability of the IPN have not been studied. Methods: Here, we utilize a combination of E-Vape® self-administration (EVSA) and patch-clamp electrophysiology to address these gaps in knowledge. Air control adult male and female C57BL/6 mice were first probed for differences in inherent excitability between sexes in the IPN using whole-cell patch clamp electrophysiology. Then mice were trained to self-administer vaporized nicotine at differing dosages. Next, we performed patch-clamp electrophysiology on the IPN of mice that completed EVSA and correlated metrics of excitability to their self-administration behavior. Results: We observed robust differences in inherent excitability of the IPN in which males demonstrate an increased excitability. We additionally found that females tend to self-administer more nicotine than their male counterparts. Further, our results show that the resting membrane potential of the IPN is increased as self-administration behavior increases in both males and females. Finally, we show a sex-specific alteration in excitability of the IPN dependent on nicotine dosage. Conclusions: These results point to a distinct sex difference in activity of the IPN in which males demonstrate an increased excitability. This, in turn, could help explain clinical observations of sex differences in nicotine use.

MU IACUC# 664

Funding: NIH grant R01 DA05071

Crow W[1], Shih K[2], Haney M[2], O'Connell L[2], Petrany SM[2], and Franks AM[2].

[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Family and Community Health; Division of Addiction Sciences, Joan C. Edwards School of Medicine

Does Medication Assisted Treatment for Substance Use Disorder Decrease Emergency Department Utilization? The PROACT Model

Introduction: PROACT is a medication-assisted treatment (MAT) facility for substance use disorders that uniquely addresses patient social determinants of health (SDoH) with wraparound services. Substance use disorders can lead to more frequent emergency department (ED) utilization, costing the healthcare system and overextending ED staff capacity. This study aims to determine if being in the MAT treatment program, PROACT, decreases ED visits.
Methods: A retrospective chart review was conducted of 190 patients from PROACT. Collected information included demographic and treatment information (gender, age, marital status, race, county of residence, type of referral to PROACT, substance used, and treatment modality), the number of ED visits per month one year prior to treatment intake and during treatment.
Results: Of the studied patients (n=190), there was a 27.40% reduction in monthly ED visits during treatment from the prior year (0.1095 vs. 0.0795; p=0.002). This was seen for both participants who were female and male (p=0.02 and 0.04), married and unmarried (p=0.007 and 0.04), white (p=0.01), Cabell County residents (p=0.003), 40-49 years old (p=0.02), self- or family-referred (both p=0.02), utilized heroin or methamphetamine (p=0.01 and 0.008), and treated with suboxone (p=0.03).
Conclusion: Properly managing patients with SUD in a MAT treatment program that addresses SDoH does significantly decrease ED utilization. This has the potential to alleviate the stress burden on local EDs but also can potentially result in massive healthcare dollar savings, which strengthens the need for expansion of the PROACT model.

IRB# 2064041-2

Torrens J[1], Lingo SF[2], and Evanson NK[2].

[1]Medical Student, Joan C. Edwards School of Medicine; [2]Pediatric Medicine and Rehabilitation, Cincinnati Children's Hospital Medical Center, University of Cincinnati

Blocking peripheral inflammatory cytokines prevents retinal cell loss and degeneration after optic nerve injury.

2.5 million people sustain a traumatic brain injury (TBI) annually in the United States. In addition to other deficits, TBIs can lead to vision impairment via eye, nerve, or brain injury. When injury affects the optic nerve, it is termed Traumatic Optic Neuropathy (TON). Studies show that TON triggers inflammation at the injury site, causing secondary damage to the optic nerve, leading to degeneration and death of nerve cells in the eye and optic nerve. Head trauma also leads to systemic (i.e. the whole body) inflammation. However, it is unknown whether injured tissue in the central nervous system (CNS) would be affected by targeting peripheral immune responses. Thus, we hypothesized that blocking peripheral cytokine signaling would improve outcomes in the optic nerve (I.e., CNS). Using a closed-head, weight-drop model, adult C57BL/6J mice received a TBI and tail blood was collected at six hours post-TBI to assess inflammatory cytokine levels via ELISA. 24 hours post-TBI, mice were injected intraperitoneally (IP) with an antibody to neutralize either IL-1β, Il-6, or TNFα. Tissue was collected seven days post injury to identify degenerating axons and retinal ganglion cell loss. Before neutralization of antibodies, IL-1β and IL-6 were significantly increased in mice given a TBI, while TNFα was significantly decreased. After monoclonal antibody injections, only injured anti-IL6 mice showed less degeneration compared to control mice. Most interestingly, blocking any of these inflammatory cytokines prevented retinal cell loss in injured mice compared to controls. These results suggest that blocking peripheral inflammatory cytokines may provide beneficial effects.

IACUC# 2022-0034

Funding: Department of Defense, W81XWH-21-1-0907

Sherif J[1], Anestis DK[2], Rose S[2], Jarrell M3, Marcum T[2], Harmon N[2], and Rankin GO[2].

[1]Pharmceutical Sciences, School of Pharmacy Marshall University; [2]Biomedical Sciences Department, Joan C. Edwards School of Medicine; [3]Chemistry Department, College of Science, Marshall University

Nephrotoxicity Potential of 2,5-Dibromophenol in Isolated Kidney Cells from Fischer 344 Rats

Bromobenzenes are important chemical intermediates for many agricultural and industrial products. Human exposure to a bromobenzene can cause toxicity in several organs, including the liver, kidney, and lung. There is a lack of information regarding the toxic effects of dibromobenzenes or their metabolites on the kidney. Studies in Dr. Rankin's laboratory were conducted to explore these gaps in knowledge. This investigation was conducted using kidney cells isolated from male Fischer 344 rats, which were treated with 2,5-dibromophenol, in order to determine its toxicity. Toxicity is measured through determining the amount of lactate dehydrogenase, LDH, released into media or through the use of the trypan blue exclusion technique. The compound 2,5-dibromophenol, a metabolite of 1,4-bromobenzene, was tested for nephrotoxicity at the concentrations of 0.25mM, 0.5mM, and 1.0mM as well as in the presence of the antioxidants, glutathione (GSH) and ascorbate (ASC) as pretreatments with the factor of time, 30 minutes versus 60 as a variable. The concentration and time of exposure influences the nephrotoxicity of the compound, the higher the concentration of 2,5-DBP, and the longer the samples were treated and oxygenated, the more likely the result is toxic. The antioxidants, GSH and ASC, each provided practically equal protection on the effects of 2,5-DBP toxicity. The antioxidants capability of decreasing the toxicity of 2,5-DBP reinforces the idea of free radicals contributing to the nephrotoxicity. GSH blocks alkylation in addition to scavenging free radicals, which suggests alkylation is not the main mechanism causing toxicity. ASC provided protection indicating that free radicals, in some form, contribute to 2,5-DBP toxicity.

MU IACUC # 531

Funded in part by NIH Grant P20GM103434

Oral Session 2 9:30 AM – 10:45 AM

Al-Akbar U, Umer AM, Rizwan U, and Cheshire M.

Camden Clark Medical Center, West Virginia University School of Medicine, Parkersburg, WV

Impact of Pre-eclampsia on Long-term Cardiovascular Risk: Findings from a Retrospective Study

Background
Pre-eclampsia (PE), affecting approximately 4 million women annually, is diagnosed by sudden-onset hypertension (>20 weeks gestation) and complications like proteinuria. Our study examines the long-term risk of arrhythmias in women with PE to enhance understanding and prevention of future cardiovascular issues.
Methods
This observational cohort study used the US Collaborative Network to analyze electronic medical records from 64 US healthcare organizations. We identified 7,463 women with PE and 7,463 matched women without PE, following them from their first pregnancy to the incidence of arrhythmia, death, or end of study. The primary outcomes were heart failure, cardiac arrhythmias, atrial fibrillation/flutter, supraventricular tachycardia, and ventricular fibrillation. Incidence rates and adjusted hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated using Cox proportional hazards models over a median follow-up of 1 year.
Results
Women with PE had significantly higher risks of heart failure (HR 6.39, 95% CI: 3.48–11.74, $p = 0.007$), cardiac arrhythmias (HR 1.70, 95% CI: 1.35–2.13, $p < 0.001$), and atrial fibrillation/flutter (HR 2.73, 95% CI: 1.22–6.13, $p = 0.011$). No significant difference was observed for supraventricular tachycardia (HR 0.93, 95% CI: 0.44–1.98, $p = 0.116$), while ventricular fibrillation risk was 49% higher in the PE cohort (HR 1.49, 95% CI: 1.01–2.19, $p = 0.044$).
Conclusion
Women with pre-eclampsia have significantly higher risks of developing heart failure, cardiac arrhythmias, and atrial fibrillation/flutter compared to those without PE. Our findings highlight the need for targeted cardiovascular monitoring in women with a history of PE.

IRB approval was not required as the study utilized de-identified data.

Bowens E and Kumika T

Health Sciences, College of Health Professions, Marshall University

The Effects of aging and sex effects on muscle size in male and female rats

Skeletal muscle properties change due to internal (aging, sex) and external conditions (physical activity). Inactiveness due to micro-gravity is known to induce significant skeletal muscle atrophy accompanied by muscle weakness. A countermeasure that can ameliorate microgravity-induced atrophy is muscular contraction during spaceflight. Flight missions require wide ranges of expertise with the crew typically consisting of diverse ages and sex. However, the aging and sex effects on such changes during spaceflight are unknown. Using hind limb suspension (HLS, a microgravity-simulation), the aging and sex effects on skeletal muscle responses to exercise were analyzed. We hypothesized skeletal muscle fiber diameter is affected by exercise and influenced by sex difference.

Fifty-six rats were divided into two groups (HLS, HLS + Stretch). All rats underwent 14 days of HLS. The hindlimbs were suspended by a modified hindlimb suspension method with one limb kept in maximal dorsiflexion to induce passive stretch (HLS+ stretch) while the opposite was free from restraint (HLS). Since micro-gravitational effects are more significant in type I skeletal muscle fibers, the soleus muscle, was analyzed in this study. Each muscle was divided cross-sectionally, stained, and digitally photographed allowing diameter measurements to be made with ImageJ software. Preliminary results show that exercise induced significant soleus muscle diameter hypertrophy among all groups ($p<0.001$) and that male soleus muscles were significantly larger than female soleus muscles ($p<0.003$). Trend of size differences in aging and sex were also observed. Further studies with larger sample sizes are recommended to identify the interaction of aging and sex effects.

MU IACUC # 910385

Funding: NASA West Virginia Space Grant Consortium

Alagha Z[1], Wiese J[1], Abdeen AMZ[1], Smith M[1], Khanna S[2], and Al-Astal A[3].

[1]Internal Medicine, Joan C. Edwards School of Medicine; [2]Medical Student, Joan C. Edwards School of Medicine; [3]Pulmonary and Critical Care Medicine, **Joan C. Edwards School of Medicine**

Pulmonary Hypertension Registry for Surveillance and Evaluation at Marshall University (PULSE-M)

Background: Pulmonary hypertension (PH) affects up to 1% of the population, with many patients experiencing significant delays in diagnosis, especially in rural areas like West Virginia. Thus, we established a PH registry for precapillary PH (Pre-PH) patients, capturing clinical and hemodynamic data to improve outcomes in this underserved region.
Method: We analyzed data from patients with Pre-PH enrolled consecutively in our PH registry between July 2021 and June 2023. The workup included echocardiography, blood tests, pulmonary function tests, CT, RHC, WHO functional classification, and a six-minute walk test. Patients with intermediate-to-high echocardiographic probability, low DLCO, or suspicious CT findings were referred for RHC. Pre-PH was defined as mean pulmonary arterial pressure ≥20 mmHg, PVR >2 Woods units, and PAWP ≤15 mmHg.
Results: Baseline data from 87 patients diagnosed with PH revealed that 57 (65.5%) had Pre-PH. The average age was 69.8 ± 12.3 years, with 75% females. Right ventricular systolic pressure (RVSP) averaged 60.4 ± 23.7 mmHg. RVSP was unmeasurable in 24.6% due to the absence of a tricuspid velocity signal and was below 40 mmHg in 19.7%. For PFTs, 50% had FVC%/DLCO% above 1.3. Hemodynamically, 6.7%-14.4% were classified as high risk, with a 3-year mortality rate of 14.3%.
Conclusion:
There is a high prevalence of pre-PH in our region, with many patients referred at advanced stages. Echocardiography alone often misses cases, making FEV%/DLCO% and CT findings crucial for identifying at-risk individuals. We emphasize the need for early referral and plan to implement a targeted referral system for suspected Pre-PH.

IRB# 2082591-5

Hicks R[1], Casto M[2], and Brazeau [D3].

[1]Medical Student, Joan C. Edwards School of Medicine; [2]School of Pharmacy, Marshall University; [3]Biomedical Sciences, Joan C. Edwards School of Medicine.

Evaluating the preservation and quantification of three viral RNA pathogens From a Collection and Transport System for Rapid Point-of-Care Diagnostic Tests

Recent advances in genomic technologies enable precise and rapid pathogen detection, with Point-of-Care (POC) systems offering ease of use for non-specialist personnel. A key aspect of POC testing is the compatibility of sample storage and transport media. This study evaluates the effectiveness of MK Buffered solution in preserving the detectability and quantification of three RNA viruses—SARS-CoV-2, Influenza A, and RSV-A—after storage at up to 30°C using the Cepheid GeneXpert IV PCR system.

We prepared serial dilutions of heat-inactivated SARS-CoV-2 (NR-52286), Influenza A (ATCC VR-1469), and RSV-A (ATCC strain VR-26), adding them to a clinically negative nasal matrix (Lee Biosolutions). Each sample was mixed with 1 mL of MK buffered solution to achieve a final concentration of 15 genomes/µL. Samples were stored at 4°C and 30°C for 0, 1, 7, and 28 days. Detection was performed using the Cepheid GeneXpert IV system with TAQMan® probes.

Results showed that MK buffered solution supported accurate detection and quantification of all three viruses. At 4°C, there were no significant changes in Ct values over 28 days (SARS-CoV-2: $F=2.42$, $P=0.12$; Influenza A: $F=0.18$, $P=0.90$; RSV-A: $F=3.24$, $P=0.06$). However, at 30°C, degradation was observed in samples stored for 28 days (SARS-CoV-2: $F=16.3$, $P=0.0002$; Influenza A: $F=14.4$, $P=0.0002$; RSV-A: $F=8.27$, $P=0.004$), with significant differences noted in the 28-day samples.

In conclusion, MK buffered solution is effective for the preservation of RNA viruses, enabling reliable detection and quantification after prolonged storage at elevated temperatures.

IRB not required

Funding: Puritan Medical Products, Guilford, ME

Tsopmegha E, Haynes J, Singh S, and Sundaram U.

Department of Clinical and Translational Sciences, Joan C. Edwards School of Medicine.

Clostridioides difficile toxin A regulates SGLT1 function and expression in intestinal epithelial cells

Clostridioides difficile infection (CDI) is the leading cause of antibiotics-associated diarrhea and pseudomembranous colitis. CDI pathophysiology is mediated by two released virulence factors: C. difficile toxin A (TcdA) and C. difficile toxin B (TcdB). CDI can cause inflammation in both the colon (colitis) and the small intestine (enteritis). CDI colitis has been shown to inhibit NaCl absorption. Dietary glucose is primarily absorbed in the small intestine by Na-glucose co-transporter 1 (SGLT1). Our previous data reported SGLT1 inhibition by TcdB in intestinal epithelial cells (IECs). But whether TcdA affects SGLT1 in IECs is unknown. Hypothesis: TcdA regulates SGLT1 in IECs. Aim: Determine the effect of TcdA on SGLT1 in IECs. Methods: The rat small intestinal epithelial cell line IEC-18 was treated with purified TcdA for 24 hours. Cell viability was determined by MTT assay. SGLT1 activity was measured by uptake of the glucose analog 3H-OMG. Na/K-ATPase activity was determined by Pi released. Western blot analysis for SGLT1 was also performed. Results: Treatment with TcdA did not alter cell viability. SGLT1 activity was significantly decreased by TcdA treatment. Na/K-ATPase activity was also decreased by TcdA treatment. Kinetic studies demonstrated that the mechanism of inhibition of SGLT1 by TcdA was secondary to a decrease in Vmax without a change in affinity (1/Km). Western blot analysis showed a significant decrease in SGLT1 protein levels. Conclusions: TcdA inhibits SGLT1 activity and expression in IECs. Consistent with our prior observations for TcdB, TcdA also contributes to the inhibition of intestinal glucose absorption by C. difficile.

No IACUC needed as cell lines used

Funding: Veteran’s Administration Merit Review grant BX003443-01 and National Institutes of Health grants DK-108054, P20GM121299-01A1, and DK-67420

Oral Session 3 1:30 AM – 2:15 AM

Modi K[1], Gadepalli RS[2], Long TE[3], Richbart SD[1], Merritt JV[1], Miles SL[4], Dasgupta P[4].

[1]Medical Student, Joan C. Edwards School of Medicine; [2]School of Pharmacy, University of Mississippi; [3]School of Pharmacy, Marshall University; [4]Biomedical Sciences, Joan C. Edwards School of Medicine.

Non-pungent capsaicin analogs display robust growth-suppressive activity in human ovarian cancer cells

Capsaicin is a heterocyclic vanilloid compound that is the hot and pungent ingredient of chili peppers. Published reports from our laboratory show that capsaicin displays robust anti-cancer activity in human lung cancers in cell culture and mouse models. We observed that capsaicin also induced programmed cell death in human ovarian cancer cells. However, the clinical applications of capsaicin as a viable pain-relieving agent (and a feasible anti-cancer drug) are hindered by its adverse side effects. Additionally, the anti-cancer activity of these compounds has not been studied in detail.
We synthesized a panel of Region C analogs of capsaicin by adding unsaturated fatty acyl chains (with 0-6 double bonds) to the Region C of capsaicin. The growth-inhibitory activity of these Region C capsaicin analogs was evaluated using an MTT-based screening assay in OVCAR-3 human ovarian carcinoma cells. Based on the screening assay results, we selected ARVANIL and DOHEVANIL as our “hit compounds”. The growth-suppressive activity of ARVANIL and DOHEVANIL was confirmed in a second ovarian cancer cell line A2780. Based on the data obtained from the two cell lines, selected “DOHEVANIL” for our follow-up studies. We measured the pro-apoptotic activity of DOHEVANIL in a panel of human ovarian cancer cells.
The non-pungent Region C capsaicin analog Dohevanil displayed greater pro-apoptotic activity than capsaicin in human ovarian carcinoma cells. Most interestingly, Dohevanil did not impact the growth of normal human epithelial cells and may be a promising agent for the treatment of human ovarian cancer.

IRB / IACUC: Non-needed as study was in cell lines

Funding: WV-INBRE 3P20GM103434-23W1, R15 Grants 1R15CA161491-01A1, 2R15CA161491-02), R15AI15197-01, and R15HL145573-01. SDR is a recipient of NSF-SURE and WV-NASA Space Consortium undergraduate fellowships respectively.

Anderson C[1], Childress AC[2], Clements MP[2], Hawk LA[2], Perryman GE[2], Dauber JA[3], Mehta SP[2], and Bullock M[4].

[1]Medical Student, Joan C. Edwards School of Medicine; [2]Physical Therapy Program East Tennessee State University; [3]Physical Therapy, Marshall University; [4]Orthapedic Surgery, Joan C. Edwards School of Medicine

Characteristics of People Who Achieve Acceptable Symptom State after Total Hip Replacement

Patient Acceptable Symptom State (PASS) is characterized as the highest level of symptom state beyond which patients consider themselves well and achieve the desired functional status.1 The Joint Replacement version of the Hip Disability and Osteoarthritis Outcome Score (HOOS-JR) is a measure of choice for assessing outcomes of total hip replacement (THR) in the USA.2 People who undergo THR experience the most improvements in HOOS-JR scores in 6-months following THR.3,4 This study examined the characteristics of people who do, or do not, achieve PASS as reflected on HOOS-JR scores 6-months after THR.
Number of Subjects: 64 patients who underwent THR (61.4±10 years)
Methods: Data for people who underwent THR at a tertiary care hospital were extracted from clinical charts. Extracted data consisted of demographic (age, sex, body mass index [BMI]), health (comorbid count [number of chronic medical conditions], presence of low back pain pre-surgery [LBP]), and disease-specific variables (duration of hip pain). The HOOS-JR scores at pre-surgery and 6-months after THR were extracted from the charts. People with HOOS-JR scores of >76.7 at 6-months after THR were considered responders (achieved PASS), and those ≤76.7 were considered non-responders (did not achieve PASS).5 Univariate analysis examined the differences in age, sex, BMI, comorbid count, presence of LBP, duration of hip pain, and pre-surgery HOOS-JR scores between responders and non-responders. A multivariate binary logistic regression was performed with the model including demographic and health variables, LBP, and pre-surgery HOOS-JR scores as independent variables and being responder or non-responder as the dependent variable. The odds ratio (OR) was interpreted as the index of association, where OR with p values of <0.05 were considered significant.
Results: Twenty-four patients (37.5%) from the sample failed to achieve PASS at 6-months after THR. Age, sex, comorbid count, and LBP were comparable between these non-responders and responders. However, the responders had lower BMI (29.7±8.3 versus 33.8±5.9; p=0.038) and better HOOS-JR scores pre-surgery (68.1±18.3 versus 52.8±16; p=0.001) compared to the non-responders. Logistic regression analysis identified higher BMI (OR=1.16, 95% confidence interval [CI]=1.01-1.34; P=0.03) and lower pre-surgery HOOS-JR scores (OR=1.06, 95% CI=1.01-1.10; P=0.01) were found to be significantly associated with achieving PASS for HOOS-JR at 6-months after THR.
Conclusions: While most patients experience optimal recovery 6-months after THR, the results of this study indicate that people with higher BMI or lower pre-surgery HOOS-JR experience slower recovery and may not achieve optimal functional status at that time. Future research can validate the findings of this study in a larger sample. Clinical Implications: Physical therapists can provide interventions to improve lower extremity function in people scheduled to undergo THR. Physical therapists can also liaise with dietitians to adopt an interdisciplinary approach to managing higher BMI before THR. Such interventions may enable patients to experience timely recovery in hip function after THR.

IACUC# 1809230-6

Simpkins A[1], Thompson C[2], Lawrence LM[3], Allen J[3], Jensen JC[4], Denning KL[3], and Salisbury TB[2].

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AKT Serine/Threonine Kinase 1 (AKT) phosphorylates N-Myc Downstream Regulated 1 (NDRG1) on Threonine 346 and Serine 330 in clear cell renal cancer carcinoma cells

In 2024, approximately 80,000 new kidney cancer cases, and 15,000 kidney cancer deaths are projected in the US. Roughly 80% of kidney cancer is clear cell renal cell carcinoma (ccRCC). Proteomics showed increased expression of phosphorylated NDRG1 (on Threonine (Thr) 346) in clinical ccRCC samples compared to pair-matched normal renal tissue. We postulate that upregulation of phosphorylated NDRG1 promotes cancer cell survival. Because the kinase AKT is critical for cell survival, we hypothesize that AKT phosphorylates NDRG1 (on Thr346 and Serine 330) in ccRCC cells. Methods: The human 786-0 ccRCC cell line was treated with the AKT inhibitor, AZD5362, and expression of total NDRG1, and phosphorylated NDRG1 was measured by Western blot analysis. The results showed that inhibition of AKT significantly reduced the phosphorylation of NDRG1 (on Thr346 and Serine 330) by 90% relative to controls at 1 hour post-treatment. Inhibition of AKT reduced total NDRG1 by approximately 30%. Thus, the primary role of AKT is to phosphorylate NDRG1, not stabilize NDRG1 protein. The inhibition of SGK1 and GSK3β reduced the phosphorylation of NDRG1 by 50% and 30%, respectively. This indicates that several kinases phosphorylate NDRG1 in ccRCC cells.

Conclusion: The AKT inhibitor, AZD5362, is a clinically relevant drug used to treat breast cancer. We show that inhibition of AKT with AZD5362 significantly reduces the phosphorylation of NDRG1 in ccRCC. Given that NDRG1 is a stress response protein, we postulate that preventing its phosphorylation by inhibiting AKT will reduce the viability of ccRCC cells within the hypoxic tumor environment.

IRB# 112274

Funding: INBRE grant (P20GM103434) COBRE grant (1P20GM121299) (WV-CTSI) grant (2U54GM104942)

Poster Session 1 12:15 PM – 1:30 PM

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5	Hicks
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8	Wohler
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68	Crislip
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70	Tah
71	Alagha
72	Barmak
73	DeTemple
74	Lulek
75	Thanigaivasan
76	Baumgartner
77	Lee

Zill S[1], Chaudhry SS[1], Kudyba IM[2], and Szczecinski N S[2].
[1]Biomedical Sciences Joan C. Edwards School of Medicine; [2]Mechanical and Aerospace Engineering, WVU.

How are variations in forces signaled and controlled? Hysteresis in force detection in the legs of insects and exploring its potential application in walking machines

Transient increases or decreases in forces can be significant in control of posture and walking. We have studied how variations in forces are encoded in the legs of insects. Sensory signals were recorded from the tibial campaniform sensilla, receptors that detect forces via cuticular strains. Forces were applied to the tibial segment of the hindlegs in juvenile (instars 7-11) and adult cockroaches, blowflies and stick insects. In all tests, the tibial sensilla respond vigorously to increases in bending forces applied to the leg. We also studied the effects of transient decreases in sensory discharges using waveforms that first rose exponential to a level. Sudden decreases (150 ms duration) were then applied after a stable level had been attained and, unexpectedly, produced transient complete inhibition of sensory firing at all force levels. Similar inhibition could be elicited in all stages of development in cockroaches. We suggest that hysteresis represents an adaptation in motor control: complete inhibition of sensory firing could contribute to rapid adjustments of motor outputs to force variations that are integrated with ongoing, residual muscle tensions. We have also developed a mathematical model of the receptor that can reproduce many characteristics of encoding seen in the animal and are currently testing the effects of transient perturbations in the model and in outputs of strain gauges in a robotic leg (located similar to the animal). Our results support the idea that hysteresis in sensory discharges may be advantageous in force control in both animals and walking machines.

IACUC approved study 1563155
Funding: NSF CRCNS 2113028

Hicks R[1], Kingson I[1], and Gaal J[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Psychiatry, Joan C. Edwards School of Medicine

Pharmacological Interventions for Complex Psychiatric Presentations

This case report discusses the use of naltrexone and mirtazapine in complex psychiatric presentations refractory to conventional treatments. Naltrexone, typically used for substance use disorders, was employed off-label in a 28-year-old female with Intellectual Disability, Autism Spectrum Disorder, Schizoaffective disorder, Bipolar type, and Post Traumatic Stress Disorder. The patient exhibited severe food obsession and aggression stemming from traumatic experiences, which were unresponsive to Vyvanase and Ritalin. Following 60 days of naltrexone therapy (50 mg/day), the patient showed marked improvement in food-related behaviors, highlighting naltrexone's potential in managing compulsive behaviors beyond substance use disorders.
In a separate case, mirtazapine, known for its antidepressant properties and broad receptor effects, was utilized in a 40-year-old male with severe Obsessive Compulsive Disorder (OCD) complicated by somatic symptoms and significant weight loss. Despite exacerbating gastrointestinal symptoms, mirtazapine (15 mg initially, titrated to 30 mg) led to resolution of somatic complaints, improved eating behaviors, and enhanced impulse control over a 30-day period. This dual case study underscores the versatility of pharmacological interventions like naltrexone and mirtazapine in addressing complex psychiatric conditions, necessitating further investigation into their efficacy, safety, and optimal treatment protocols.

IRB none needed Cas Report
Funding: N/A

Prieskorn B[1], DePalo J[1], Lawson J[1], Fornwald M[1], Sisic A[1], Karczewski K[2], and Wines K[2],
[1]Medical Student, West Virginia School of Osteopathic Medicine; [2]West Virginia School of Osteopathic Medicine

Enhancing Paramedic Training through Cadaver-Based Instruction: A Qualitative Analysis of Confidence Levels in Critical Procedures

The use of cadaver-based models has become increasingly popular due to their ability to create a lifelike and engaging learning atmosphere. Demonstrations with cadaveric models present healthcare trainees with a distinct chance to connect theoretical knowledge with hands-on experience, thereby enriching their understanding of anatomy and refining procedural abilities. This study aimed utilize cadaveric models to improve the confidence levels of paramedic students from a single educational institution in performing various critical procedures via targeted educational intervention facilitated by medical students.
Using the Plan-Do-Study-Act methodology, eight common paramedic procedures were chosen to be demonstrated on cadavers to enhance the hands-on learning experience. Procedures included EKG interpretations, 12-lead EKG placement, endotracheal intubation, chest needle decompression, placement of peripheral intravenous lines, placement of intraosseous lines, shoulder slings, and ankle wraps. Data were collected on the confidence levels of students across the eight paramedic procedures before and after the intervention, using a Likert scale from 1 to 5.
Comparison of pre-intervention and post-intervention confidence levels was performed. Confidence of paramedic students improved in all eight paramedic procedures. Improvement of paramedic confidence on common procedures is possible using cadaveric models as a teaching modality. Further qualitative studies will focus on expanding these parameters to multiple paramedic programs.

IACUC No approval number required

Funding: N/A

Boyd P[1], Yaldo S[2], Denha N[2], Jabro JA[2], and Jarrell E[3].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]West Virginia School of Osteopathic Medicine; 3Jarell Family Medicine.

Case Report: Streptococcus Gallolyticus in Septic Arthritis with the Absence of Infective Endocarditis

A 82-year-old male presented to the walk-in clinic with a swollen and painful right knee that has progressed over a month. His medical history consists of atrial fibrillation, hypertension, hyperlipidemia, type 2 diabetes, and arthritis. In addition to the edema and tenderness, his right knee displayed significant warmth and limited range of motion. After collecting these findings, aspiration was performed which revealed a presence of 40,000 WBCs and 95% PMNs, findings concerning for septic arthritis. Further PCR testing identified the Streptococcus species. This prompted a referral to the Emergency department. Blood cultures and aspiration identified Streptococcus Gallolyticus, a member of the Streptococcus Bovis/Streptococcus Equinus Complex (SBSCE), which is commonly associated with infective endocarditis and colonic malignancy.
Treatment included arthroscopy of the right knee which was successful with the patient. Antibiotic regimen consisted of IV cefazolin for six weeks and then secondary prophylaxis with amoxicillin due to the presence of a cardiac device for three to six months. Transesophageal echocardiogram was negative for infective endocarditis or any pacemaker involvement and colonoscopy is being considered at this time.
This case highlights the importance of acknowledging the significance of Streptococcus gallolyticus in patients with septic arthritis and other comorbidities. Although a rare cause of septic arthritis, this bacterial species warrants an extensive workup in regards to its association with infective endocarditis and colonic malignancies. Also, it displays the importance of taking into account the vigorous and precise care needed for these patients who do contract Streptococcus Gallolyticus.

IACUC None, it is a case study
Funding: NA

Hicks R[1], and Fleshman T[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Dermatology, Joan C. Edwards School of Medicine

Retrospective Chart Review of Granuloma Annulare

This research employs a retrospective cohort study design to evaluate the efficacy of various treatments for generalized granuloma annulare at Marshall Dermatology. Patient data, including demographics, disease characteristics, and treatment outcomes, will be systematically collected from electronic health records. Specifically, we will review patient charts to assess the effectiveness of hydroxychloroquine, dapsone, methotrexate, pentoxifylline, minocycline, colchicine, and combinations of these therapies. By comparing treatment responses and examining patterns in disease progression, the study aims to identify which treatments are most effective and how patient characteristics may influence treatment outcomes. This analysis will be conducted using a password-protected Excel database to ensure data confidentiality and integrity.

IRB IRBNet ID# 2180732-1;IRB1 #00002205 IRB2 #00003206
Funding: N/A

Hicks R[1], McCoy O[1], Deschepper K[2], and Morgan D[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Biomedical Sciences, Joan C. Edwards School of Medicine

Behavioral and Physiological Effects of Precipitated THC Withdrawal in PRDX6 Mouse Models: Dose-Response and Daily Tolerance Assessment

Introduction: This study examines the role of PRDX6 in THC (Δ9-tetrahydrocannabinol) pain management and withdrawal. PRDX6 is involved in morphine tolerance through JNK activation, and similar mechanisms may affect cannabinoid tolerance. We explore whether inhibiting PRDX6 alters THC's analgesic effects.
Methods: Mice received THC (50 mg/kg) twice daily for five days. On the sixth day, THC withdrawal was induced with rimonabant, a cannabinoid receptor antagonist, administered one hour after THC. Behavioral assessments included open field tests, novel object recognition, and the tail flick test, comparing PRDX6 knockout (KO) mice with wild-type (WT) controls.
Results:
Behavioral Effects: PRDX6 KO mice showed increased motor activity, including more paw shakes, tremors, and head shakes compared to WT controls. There was a trend toward increased defecation, but no significant differences in grooming or scratching.
Physiological Effects: PRDX6 KO mice experienced significant hypothermia during THC withdrawal. Both KO and WT mice showed daily THC tolerance, evidenced by decreased responsiveness with successive doses.
Conclusion: PRDX6 is crucial in mediating THC withdrawal. PRDX6 KO mice exhibited significant behavioral and physiological changes, indicating that PRDX6 modulates cannabinoid withdrawal symptoms and tolerance. These findings suggest PRDX6 as a potential target for managing cannabis

withdrawal and improving cannabinoid-based pain therapies. Preliminary data also suggest female mice may experience more pronounced withdrawal symptoms. Further research is needed to refine strategies for alleviating THC withdrawal.

IACUC # 740
Funding: NIH grant DA044999.

Cessna L1, and Goebel L2
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Written Communication from Pharmacy Benefit Managers to Primary Care Physicians- Is It Helpful?

Background: Physicians are experiencing greater burnout due to excessive time spent on paperwork. Pharmacy benefit managers (PBMs) are adding to this problem by sending excessive mail to physicians. This study examined these mailed communications to determine their frequency and if they were acted upon by the physician. We hypothesized that few of these mailings would be helpful to the physician.
Methods: From July 2021-May 2023, we collected all written communications from PBMs to a single Geriatrics outpatient physician. We sorted this information by specific PBM, communication category, if an intervention resulted, and if communications repeated.
Results: We found that out of 263 communications, 17 (6%) resulted in interventions made by the physician. Notices of nonformulary prescriptions (35%, N=6/17) and drug-drug interactions (35%, N=6/17) (p=>0.0001) resulted in interventions most frequently. Forty-one percent (108/263) of communications were repeated and almost half of these were for recommendations (N=52/108, 48%), despite not resulting in frequent interventions.
Conclusion: Only a small number of communications were helpful to physicians. Interventions are more likely to be made by a physician if the suggestion is regarding a nonformulary prescription or a drug-drug interaction. Further research should be conducted by analyzing a larger sample of physicians.

IRB1 #00002205 IRB2 #00003206
Funding: N/A

Wohler L[1], Nguyen M[1], Singh S[1], and Walker J[2].
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Effects of Transportation on Healthcare Access in a Patient with Kidney Transplantation Living in a Rural Area

Background/Objective:
Transportation has been identified as a barrier to healthcare access in many studies. Without reliable transportation, delays in care can occur which can lead to negative outcomes. This presentation is a case study that highlights the importance of transportation access to healthcare in a rural setting.
Methods:
This presentation is a case study involving the impact of transportation availability on rural healthcare.
Results / Patient Case:
A 22-year-old male with a history of kidney transplantation presented to the clinic with acute gastrointestinal symptoms. Lab results showed acute renal failure with ultimate diagnosis of transplant rejection. The patient revealed that he had missed his anti-rejection medication for several weeks due to a lack of transportation to his transplant specialist.
Conclusion:
Lack of reliable transportation access can cause delays in patient care and lead to poor outcomes. Patients with lower socioeconomic status are particularly affected and some studies suggest that rural patients may also face increased transportation challenges. In our patient's case, his inability to see his specialist and obtain necessary medications led to transplant rejection—a complication that could have likely been prevented with timely medical intervention. Based on this case, we feel it is essential that both primary care providers and specialists remain mindful of the importance of transportation in healthcare access and work to make sure that this patient need is addressed to the best of their ability.

IRB: Case Study
Funding: No funding necessary

Puckett S[1], Griffith B[2], and Schaper D[3].
[1]Medical Student, West Virginia School of Osteopathic Medicine; [2]Department of Biomedical Sciences, West Virginia School of Osteopathic Medicine; [3]Department of Clinical Sciences, West Virginia School of Osteopathic Medicine

Nutrition as a Means of Symptom Management in Polycystic Ovarian Syndrome: A Literature Review

Background: Polycystic Ovarian Syndrome (PCOS) is an endocrine disorder that affects 9% of individuals assigned female at birth worldwide. Increased frequency in pulsatile release of Gonadotropin Releasing Hormone (GnRH) augments the Luteinizing Hormone to Follicle Stimulating Hormone (LH/FSH) ratio resulting in ovarian cyst formation, decreased ovulation, and infertility. Symptoms of PCOS include menstrual cycle dysregulation, hirsutism, insulin resistance, and risk of comorbidities.

Objective: Treatment options for PCOS focus on lifestyle changes to reduce symptom severity. The purpose of this study is to evaluate the current nutritional recommendations for symptom management of Polycystic Ovarian Syndrome.
Methods: A literature review was conducted that used peer-reviewed medical publications from 1991-2024 comparing dietary recommendations and the impacts on PCOS. Search terms included, “PCOS lifestyle modifications,” and “PCOS nutrition.” This project does not contain human subjects’ research so there are no ethical considerations to address with the Institutional Review Board.
Results: Suggested diets for patients with PCOS include Dietary Approaches to Stop Hypertension, the Ketogenic Diet, the Low-Glycemic Index Diet, and the Mediterranean Diet. All four diets demonstrate improvements in insulin resistance, hormonal dysregulation, anthropometric measures, or fertilization outcomes, but none alleviate all symptoms.
Conclusions: Though there is no cure for PCOS, studies indicate that nutrition plays a vital role in symptom reduction. Adhering to a well-balanced lifestyle seems to provide beneficial symptom management. Further investigation into the diverse presentations of PCOS symptoms, the variety of negative health ramifications, and focusing on individualized medicine may reduce the disease state and enhance patients’ quality of life.

IRB: Literature Review none needed
Funding: N/A

Nguyen M[1], Singh S[2], Bevan S[2], Llerena R[2], Mabalot M[3], Frank A[2].
[1]Medical Student, West Virginia School of Osteopathic Medicine; [2] West Virginia School of Osteopathic Medicine; [3]Green Valley Medical Center

Three Month History of Lymphadenopathy Caused by Bartonella henselae In A 13-Year-Old Following a Dog Scratch

Introduction
Cat-scratch disease (CSD) is an infectious condition typically caused by Bartonella henselae, most commonly transmitted through cat scratches or bites. Although usually self-limiting, CSD can present with various symptoms, including regional lymphadenopathy, fatigue, and systemic manifestations. This case highlights an unusual presentation of CSD following a dog scratch in a 13-year-old boy, emphasizing the importance of considering CSD in the differential diagnosis of unexplained lymphadenopathy.
Case Presentation
A 13-year-old immunocompetent male presented with a three-month history of a right cervical neck mass, accompanied by fatigue, back pain, and significant weight loss (20 lbs. over six months). Physical examination revealed a mobile, 3-cm mass on the right medial clavicle, with ultrasound confirming bilateral lymphadenopathy. Initial serological tests for common infectious agents were negative, but high titers of IgM and IgG against Bartonella henselae were detected. Fine needle aspiration (FNA) revealed lymphoid proliferation without malignancy. The patient was treated with azithromycin and amoxicillin-clavulanic acid, resulting in a significant reduction in the mass size and improvement in symptoms within a few weeks.
Discussion
This case underscores the importance of including CSD in the differential diagnosis of lymphadenopathy, even in the absence of cat exposure, as other animals, like dogs, can also carry Bartonella henselae. The patient's clinical presentation, positive serology, and response to antibiotic therapy support the diagnosis of CSD. Early recognition and appropriate treatment are crucial, especially when CSD mimics more serious conditions such as malignancies.

IACUC None required. This is a case report.
Funding: N/A

Gervasio E[1], Nguyen M[2], Yaldo S[2], Nicoloudakis O[2], Farry P[2], and Iannetti M[3].
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Statin Induced Delayed Rhabdomyolysis of the Lower Extremities in a 63-Year-Old Woman

Introduction
This case report discusses a rare instance of statin-induced delayed rhabdomyolysis in a 63-year-old woman with a history of coronary artery disease. Rhabdomyolysis, characterized by muscle necrosis and significant elevations in creatine kinase (CK) levels, is a severe but uncommon side effect of statin therapy, about 1.5 deaths per 10 million prescriptions. Despite the widespread use of statins as a primary treatment for hyperlipidemia and cardiovascular disease, their potential to cause severe myopathies, including rhabdomyolysis, remains a critical concern, especially when multiple medications are involved.
Case Description
The patient presented to the emergency department following a fall, which occurred after experiencing sudden weakness in her lower extremities. She had no major injuries and was brought to the hospital a week after the fall. She reported persistent generalized pain, particularly in the lower extremities and right shoulder, which hindered her mobility. Laboratory tests revealed significantly elevated CK levels (~26,000 U/L), indicative of muscle injury. Magnetic resonance imaging (MRI) of the right thigh confirmed diffuse muscle edema. Autoimmune markers were negative, rendering autoimmune myositis as a differential diagnosis less likely. The patient had a muscle biopsy which showed striated muscle with wide scattered myofiber degeneration consistent with rhabdomyolysis. No active myositis, vasculitis or inclusion bodies were noted.

The patient's medication history included rosuvastatin use for one year, making statin-induced rhabdomyolysis the most likely cause. Discontinuation of rosuvastatin was initiated, and the CK levels were normalized within the following days, and the patient's strength improved.
Discussion
The discussion highlights the clinical spectrum of statin-induced myopathy, which ranges from mild myalgias to severe rhabdomyolysis. The pathophysiology of statin-induced myopathy, particularly its relationship with the cytochrome P450 enzyme system, is emphasized. Statins metabolized by CYP3A4, such as atorvastatin, lovastatin, and simvastatin, are associated with a higher risk of rhabdomyolysis compared to those that are not, such as fluvastatin and pravastatin.
This case underscores the importance of recognizing statin-induced myopathies early, especially in patients on complex drug regimens, to prevent progression to life-threatening conditions like rhabdomyolysis. Prompt discontinuation of the offending agent typically leads to clinical improvement and a decreased risk of progression to rhabdomyolysis. Further research to better understand the mechanisms underlying statin toxicity and to optimize the safe use of these widely prescribed medications are warranted.

IRB: Case Report
Funding: none

Hoard S[1], Andrews L,[2] and Davies T[2].
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Relapse Recognition and Standard Operating Procedures in Pregnant Participants with Substance Use Disorder

This retrospective study examines relapse patterns among pregnant participants in the Medication Treatment for Opioid Use Disorder in Expectant Mothers (MOMs) trial (IRB Number 1839138). The project serves as a dual-purpose initiative: a quality improvement study to enhance the detection of relapse risks and an original investigation into the development of a relapse standard operating procedure (SOP). By analyzing data from 13 participants who underwent weekly evaluations during the trial, the study seeks to identify factors that may predict relapse, such as life events or changes in compliance with pharmacologic treatment. Self-reported relapse risks, confirmed relapses via urine drug screens, and the interventions taken in response to identified risks are documented in the relapse prevention and response protocol.

This analysis aims to correlate specific risks, like familial stressors, with confirmed relapses, thereby providing insights into effective intervention strategies. For example, if a participant reports stress due to a family member's hospitalization and subsequently relapses, the study may identify this as a critical risk factor. Conversely, if intervention actions are taken and no relapse occurs, these actions could be instrumental in maintaining sobriety. The findings will contribute to the creation of a comprehensive SOP for healthcare providers, enabling them to better support pregnant patients with substance use disorder by anticipating and addressing potential relapse triggers, particularly during vulnerable periods such as postpartum.

IACUC 2222460-1 and 1839138 (original study)
Funding: N/A

Nguyen M[1], Singh S[2], Bawa K[2], Igatpuriwala N[2], and Singh S[3].
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Atypical Case Of High-Grade Prostate Adenocarcinoma In A 46-Year-Old Caucasian Male: A Clinical Case And Literature Review

Introduction
Prostate cancer (PC) is predominantly a disease of older men, with approximately 85% of cases diagnosed in those aged 65 and older. However, the incidence of early-onset prostate cancer (EPC) is increasing, accounting for about 10% of new cases in men under 55 years. This case report highlights a 46-year-old male with advanced prostate cancer, emphasizing the importance of early detection and screening, even in younger populations with atypical risk profiles.
Case Presentation
A 46-year-old Caucasian male presented with gross hematuria, a 50-pound weight loss over one year, and urinary symptoms including dribbling and a weak stream. He also reported perineal pain, hip pain, and headaches. Laboratory tests showed elevated prostate-specific antigen (PSA) levels (49.4 ng/mL and 75 ng/mL) over two months. A prostate biopsy confirmed acinar adenocarcinoma with a Gleason score of 9 and evidence of perineural invasion. Further imaging revealed metastatic spread to the spine and pelvic lymph nodes. The patient was treated with androgen deprivation therapy (ADT) and enrolled in a clinical trial for Lu-PSMA-617, which showed significant improvement on follow-up imaging.
Discussion
This case illustrates the unusual presentation of advanced prostate cancer in a relatively young patient, highlighting several atypical features, including the absence of a family history of PC, no history of smoking or alcohol consumption, and significant metastatic disease at diagnosis. The case underscores the need for heightened awareness and consideration of prostate cancer in younger patients, particularly those presenting with non-specific urinary symptoms, to enable timely diagnosis and intervention.

IACUC N/A (case report)

Funding: N/A

West J[1], Nnaka U[1], Nellhaus E[2], and Buerck J[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Obstetrics and Gynecology, Joan C. Edwards School of Medicine

The Role of Fasting Plasma Glucose on Neonatal Outcomes in Women Who Do Not Receive the Diagnosis of Gestational Diabetes Mellitus

Elevated fasting plasma glucose (FPG) levels during pregnancy have been consistently linked to adverse pregnancy outcomes, including fetal macrosomia and shoulder dystocia, serving as independent risk factors (1-5). Maternal obesity is also associated with having large-for-gestational-age (LGA) babies, partly mediated by FPG measured between 24-28 weeks of gestation (6). Even maternal hyperglycemia below the threshold for diabetes diagnosis is associated with increased birth weight and elevated cord blood serum C-peptide levels (7). Elevated FPG is further correlated with higher rates of neonatal intensive care unit (NICU) admissions and preterm births, highlighting the need for careful glucose monitoring and management during pregnancy (3,5,8). Additionally, women who deliver via cesarean section have higher FPG levels in the third trimester (9). These findings emphasize the importance of FPG assessment in predicting and mitigating adverse maternal and neonatal outcomes. Our chart review aims to evaluate neonatal outcomes in women with elevated FPG levels at 24-28 weeks of gestation who do not receive a diagnosis of gestational diabetes mellitus (GDM). We hypothesize that women with elevated FPG during screening, who do not fail the glucose tolerance test (GTT), will have neonatal outcomes similar to those diagnosed with GDM.

IACUC 2172921-1
Funding: N/A

Duty K[1], Genesis R[1], and Carico R[2].
[1]Pharmacy Student, Marshall School of Pharmacy; [2]Marshall School of Pharmacy

State Requirements for Accessing PDMPs Before Prescribing Controlled Substances

Prescription Drug Monitoring Programs (PDMPs) are online portals that were developed as a means for healthcare professionals to access information concerning the dispensing of controlled substances. The goal of these programs is to help prescribers and dispensers prevent the misuse and abuse of controlled substances. Requirements for accessing PDMPs before prescribing or dispensing controlled substances may be different from state to state. The purpose of this project was to characterize specific variations in requirements to access PDMPs. This study utilized various methods for acquiring information including reviewing state law references and state board references such as those designated by the Board of Pharmacy and the Board of Medicine. Specific requirements varied widely. While some laws denoted specific requirements such as when a PDMP must be queried, how often, and for which controlled substances, others were vaguer leading to greater interpretation and discrepancies throughout the regulations. Of note, West Virginia requires stricter governance than many states when prescribing controlled substances.

IRB : not needed
Funding: N/A

***Allen C[1], *Hackett J[1], Koester A[2], Cunningham M[3], and Lycans D[2].**
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***Equal First Authors**

Operative Management of an Ulnar Stress Fracture in a Collegiate Cheerleader

Ulnar stress fractures are relatively rare, particularly in the context of collegiate cheerleading. This case report explores the presentation, diagnosis, and surgical management of an unexpected stress fracture in the ulna of a collegiate cheerleader. An 18-year-old female presented with persistent, localized pain in her non-dominant arm. Imaging revealed an isolated ulnar stress fracture, an unusual finding despite participating in this physically demanding sport. Surgical intervention was deemed necessary, and a nail fixation technique was employed to stabilize the fracture. Ulnar stress fractures, though rare in cheerleading, can present unique challenges. This case report documents the effectiveness of an operative approach in facilitating a successful return to sport.

IRB N/A case report
Funding: N/A

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Addressing Infertility Care Disparities in West Virginia

Introduction: Infertility is an issue that affects many individuals. In the United States, access to infertility care is more widely available than ever before, but many factors can prevent patients in need of these services from receiving them. Several of these factors are felt more severely in certain regions, and rural areas may have to overcome additional unique challenges. West Virginia has faced health disparities before, and similar measures that have been successfully utilized may provide a potential solution to addressing access to infertility care.
Methods: A literature review was conducted to examine the factors influencing reproductive health in West Virginia, barriers to accessing fertility care, and actions taken to address these disparities.
Conclusions: Individuals in West Virginia seeking infertility care are geographically underserved, often struggle to afford treatment, and may face cultural disadvantages. Techniques such as telemedicine, legislative action, and the recruitment of additional healthcare workers have successfully addressed healthcare disparities in the past and could be utilized to improve the accessibility of infertility treatment within the state.

IRB none literature review
Funding: none

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Cooking for Wellness: A Study on Improving Health Through Culinary Skills

Background: Cooking skills are essential for preparing nutritious meals, which are critical for maintaining overall health. The Cooking for Health program was developed to enhance participants' culinary skills and knowledge, empowering them to make healthier dietary choices. This study aimed to evaluate the effectiveness of the Cooking for Health program in improving participants' confidence in meal preparation, understanding of nutrition, and frequency of cooking healthy meals at home.
Method: Participants completed pre- and post-surveys that assessed their confidence in cooking skills, knowledge of nutrition, and cooking behaviors before and after attending the program. The surveys included questions related to their ability to prepare healthy meals, use of cooking techniques, and understanding of food as medicine.
Results: Analysis of the survey data revealed significant improvements in participants' confidence in selecting and preparing fresh ingredients, as well as a greater understanding of nutrition and balanced meals. Additionally, participants reported an increased frequency of cooking at home, indicating a positive behavioral shift towards healthier eating practices.
Conclusion: The findings suggest that the Cooking for Health program is an effective intervention for enhancing culinary skills and promoting healthier eating behaviors. These results highlight the value of culinary education in public health initiatives aimed at improving dietary habits.

IRB approval was not necessary for this research.
Funding: None

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Early Stage Breast Cancer with Rare Distant Metastasis: A Case Report

Introduction: Ductal cell carcinoma in situ (DCIS) is a non-invasive stage 0 breast cancer that can progress to invasive ductal carcinoma (IDC), the most common form of breast cancer, if untreated. A minority of women with early stage breast cancer may experience recurrent advanced cancer which can progress to metastatic disease, commonly in the bone, liver, lung, and brain. This report examines 2 cases of early stage breast cancer with rare distant metastasis into the peritoneum, presenting with ascites.
Case Presentation: The first case is a 66 year old female who was treated for IDC of the right breast after a screening mammography. She underwent a lumpectomy with sentinel lymph node biopsy with negative margins and received chemotherapy. 1.5 years later she presented with abdominal pain and was found to have ascites. Omentum and bladder biopsies were positive for carcinoma. The second case is a 49 year old female who presented with abdominal pain and distention. A CT scan and biopsies revealed metastatic processes originating from the breast. A mammogram and biopsy revealed high grade DCIS of the right breast. She presented again for worsening symptoms and a CT scan revealed abdominal and pelvic ascites, diffuse hepatic metastasis, and a small right breast nodule.
Conclusion: Breast cancer rates increase annually; however, mortality rates are falling due to raised awareness and earlier detection. It is essential that physicians know the risk factors to detect distant recurrence and increase survival time with metastatic breast cancer in patients who originally present with very early stage disease.

IACUC None required
Funding: None

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Incidental Cerebellar Ganglioglioma in a 32-year-old Patient

Gangliogliomas (GGs) are rare central nervous system neoplasms composed of neuronal and glial cells, constituting less than 1% of all brain tumors and 1-7% of pediatric CNS tumors. Predominantly affecting individuals under 30, most GGs occur supratentorially, especially in the temporal lobe, leading to intractable epilepsy, while cerebellar GGs are notably rare. Symptoms often present years before diagnosis, and optimal treatment involves surgical resection. This report details a rare case of a 32-year-old male with an incidentally discovered cerebellar GG following a motor vehicle accident. The literature review highlights the variability in symptoms, age, and imaging findings, emphasizing the importance of considering GG in differential diagnoses for infratentorial tumors. The patient's treatment involved subtotal resection due to the risk of significant neurological deficits, with ongoing monitoring for recurrence. This case demonstrates a generally favorable prognosis of cerebellar GGs when appropriately managed surgically.

IRB: case report
Funding: N/A

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Patient Perception of a Smoking Cessation Curriculum Offered with Mobile Low Dose CT

Smoking remains a significant health concern in rural West Virginia (WV), where access to healthcare and smoking cessation resources is limited. Over half of the state's residents live in areas with unreliable transportation, leading to delays in health care screenings and follow-up appointments. West Virginia also has one of the highest incidences of lung cancer in the US, with smoking being the leading risk factor. Previous research has demonstrated that utilizing low-dose computed tomography (LDCT) as a "teachable moment" can be effective in promoting smoking cessation. However, a program tailored to the LDCT results is needed to maximize health outcomes. To address the limited access to healthcare and smoking cessation education, this study aims to evaluate patient perception of an accessible smoking cessation program offered alongside mobile LDCT screenings. Adult patients eligible for LDCT will be invited to participate in an online educational smoking cessation program. The program will provide opportunities for patients to engage with professionals and access a variety of tools from respected organizations and institutions. Through this study, we hope to identify barriers that must be addressed to decrease lung cancer rates in rural West Virginia.

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The Synergistic Effect of High-fat diet Consumption and Vaping on the Brain and Metabolic System

Significance: Despite the continued increase in tobacco-related deaths and the preference for fat-rich foods, few studies have explored the synergistic effects of high-fat diet consumption and vaping on the brain and the metabolic system. Therefore, our objective was to investigate if excessive consumption of a high-fat diet (HFD) influences nicotine use behavior and in parallel examine the effects of diet plus passive nicotine vapor exposure on ventral tegmental area dopamine cell integrity and metabolic health. Methods: Adult mice were fed HFD or standard diet (SD) for 6 weeks and then trained to self-administer nicotine using an e-vape® self-administration (EVSA) assay composed of fixed, and progressive ratio schedules. In a separate cohort of mice, we examined the effects of HFD and nicotine eVape co-exposure on glucose, insulin, leptin, and VTA DA cell integrity via Tyrosine-hydroxylase and TUNEL-immunostaining assay. Results: HFD-fed mice exhibited greater active-to-inactive distinction than the SD group. Mice assigned to HFD also displayed a significant increase in active nosepokes compared to SD mice during higher-effort tasks (FR3 sessions). Overall, mice co-exposed to nicotine and HFD exhibited significant increase in body weight, glucose, insulin, and serum leptin levels. Finally, HFD and nicotine co-exposed mice displayed enhanced raw integrated density of TUNEL-positive staining of VTA dopamine neurons. Conclusion: The behavior and metabolic data presented here suggest that HFD consumption enhances nicotine reinforcement-related behavior in adult mice and this may be due to changes in VTA DA cell integrity and disturbances in the metabolic system.

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Examining Gut Microbiota Composition Following Adolescent Binge Ethanol Exposure in Male Sprague Dawley Rats

Alcohol consumption, particularly in the form of binge drinking, peaks during adolescence and subsequently continues at moderate levels throughout the lifespan, contributing to cognitive decline during aging. However, the effect of adolescent binge ethanol exposure and the long-term impact of moderate ethanol use on the adult gut microbiome is poorly characterized. To understand changes in microbial communities during adolescent alcohol exposure, the gut microbiome composition of male Sprague Dawley rats was examined over three consecutive timepoints, with fecal samples collected from postnatal day (PND) 44-72. During this period, animals were subjected to binge ethanol exposure. Next, to understand the long-term consequences of continued, moderate alcohol exposure, the gut microbiota composition of adult rats provided with a bottle choice of pure water, sucrose+water, or sucrose+ethanol was examined over an additional six timepoints with fecal samples collected from PND 86-366, or to the equivalent age of a 30-year-old human. Bacterial DNA was extracted and purified from 162 fecal samples with an Omega Bio-tek E.Z.N.A. Stool DNA Kit. Subsequent analyses of fecal microbiota will be done by 16S rRNA amplicon sequencing. The 16S rRNA V3-V4 primers will be used to construct Illumina compatible sequencing libraries. The libraries will be sequenced in a 250 bp paired-end run using NextSeq 2000. The raw reads will be processed using Nephele platform for microbiome data analysis to assess taxonomy, alpha and beta diversity across multiple samples. Our study will improve understanding of the long-term consequences of alcohol exposure on the gut microbiome.

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Pulmonary Hypertension Registry for Surveillance and Evaluation at Marshall University (PULSE-M)

Background: Pulmonary hypertension (PH) affects up to 1% of the population, with many patients experiencing significant delays in diagnosis, especially in rural areas like West Virginia. Thus, we established a PH registry for precapillary PH (Pre-PH) patients, capturing clinical and hemodynamic data to improve outcomes in this underserved region.
Method: We analyzed data from patients with Pre-PH enrolled consecutively in our PH registry between July 2021 and June 2023. The workup included echocardiography, blood tests, pulmonary function tests, CT, RHC, WHO functional classification, and a six-minute walk test. Patients with intermediate-to-high echocardiographic probability, low DLCO, or suspicious CT findings were referred for RHC. Pre-PH was defined as mean pulmonary arterial pressure ≥20 mmHg, PVR >2 Woods units, and PAWP ≤15 mmHg.
Results: Baseline data from 87 patients diagnosed with PH revealed that 57 (65.5%) had Pre-PH. The average age was 69.8 ± 12.3 years, with 75% females. Right ventricular systolic pressure (RVSP) averaged 60.4 ± 23.7 mmHg. RVSP was unmeasurable in 24.6% due to the absence of a tricuspid velocity signal and was below 40 mmHg in 19.7%. For PFTs, 50% had FVC%/DLCO% above 1.3. Hemodynamically, 6.7%-14.4% were classified as high risk, with a 3-year mortality rate of 14.3%.
Conclusion:
There is a high prevalence of pre-PH in our region, with many patients referred at advanced stages. Echocardiography alone often misses cases, making FEV%/DLCO% and CT findings crucial for identifying at-risk individuals. We emphasize the need for early referral and plan to implement a targeted referral system for suspected Pre-PH.

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Bilateral Non-neoplastic Accessory Submandibular Glands Discovered Post-Mortem: A Case Study

The submandibular glands are located under the body of the mandible and act to secrete saliva into the oral cavity. They are derived from the first branchial arch and arise predominantly during weeks 6 and 7 of embryological development. There have been several reported cases of unilateral accessory submandibular glands (aSMGs), but only one reported case until now of bilateral (aSMGs). The following case was discovered incidentally during routine dissection of a cadaver for medical education purposes, and histologic examination was performed via light microscopy to dismiss neoplastic origins of the anomalous glands. The aSMGs discovered post-mortem were located in the carotid triangle around the level of the hyoid bone and received blood supply from the facial artery and innervation from the seventh cranial nerve. These glands also received venous drainage via the facial vein and communicating jugular vein. Histological analysis of the presumed glands and nearby lymph nodes of the deep cervical chain revealed normal salivary gland and lymph node tissue, respectively, with no evidence of neoplasia. This Neurovasculature does not differ significantly from that provided to SMGs in the normal location, nor does it suggest the aSMGs were nonfunctional. In fact, it is believed that these aSMGs were functional, at

least in some capacity, due to the presence of reasonable neurovasculature, a duct found oriented toward to oral cavity, and the lack of discovery of these glands prior to the patient's death.

IRB none case study
Funding: None

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Role of exercise in adipose tissue inflammation in hypertensive mice model

Macrophages accumulate in adipose tissue during hypertension, which might be involved in the inflammation of hypertension. Exercise has shown beneficial effects on hypertension; however, the exact mechanisms by which the activated immune cells partly lead to the protective effects remain to be elucidated. The objective of this study is to determine the role of exercise in the histological changes of adipose tissue. Renin transgenic (R+) mice were used as a hypertensive mice model and subjected to exercise (8 weeks). The body weight of the mice was monitored weekly. The adipose tissue samples were collected for the analyses. The structure of the adipose tissue was determined by the H&E and Masson Trichrome staining. The polarization of macrophages was determined by immunostaining (IHC). Proteins within the tissue are to be analyzed via Western Blot. Results showed a decrease in collagen content with exercise training in both mice models, and an increase in the average cell nucleus size being inversely related to the average cell size in response to exercise training. In conclusion, our data suggest that exercise provided beneficial effects by causing morphological changes in adipocytes (shrinking of cells, loss of collagen) and potentially reducing inflammation via modulating the polarization of macrophages in the adipose tissue of hypertensive mice.

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Combining Spatial Transcriptomics and Immunohistochemistry to Investigate the Relationship Between Tripartite Proximity and Changes in Local Gene Expression Across Development.

The tripartite synapse is comprised of a pre- and post-synaptic terminal, and a peripheral astrocyte process (PAP). Astrocytes are non-neuronal glial cells that ensheath the synapse and contribute to the regulation of synaptic activity. Astrocytes are extremely heterogenous, meaning they can differ in size and proximity to synapses depending on developmental stage. Previously, our laboratory has demonstrated that variability in brain maturation can be observed through temporal differences in PAP-synaptic coupling. However, it is unknown how variations in proximity and maturation are affected by the type of synapse being supported or by the type of PAP which offers the synaptic support. Here we characterize tripartite synapse maturation within the orbital frontal cortex (OFC) relative to local changes in gene expression at three developmental stages; early adolescence, late adolescence, and young adulthood. Mouse brains were collected, formalin fixed, paraffin embedded, and the OFC was sliced at 5 µm. Slices were collected consecutively allowing for alternating sections to be used for immunohistochemistry (IHC) and spatial transcriptomics (ST) to assess tripartite synapse co-localization and gene expression, respectively. Changes in tripartite synaptic structure was assessed using Stimulated Emission Depletion (STED) microscopy. ST slices were stained with the nuclear stain SPY 555, imaged using confocal microscopy followed by CytAssist HD and 10X Genomics. These procedures allowed for gene expression alignment with IHC fluorescently labeled tripartite synapses on adjacent brain slices. The data presented will demonstrate how tripartite proximity changes in relationship to changes in gene expression across development in the OFC.

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Evaluating the Accessibility of GLP-1RA and GIP Medications in Rural Counties of Kentucky, Southeast Ohio, and West Virginia

The primary objective of this research is to evaluate the accessibility of glucagon-like peptide-1 receptor agonists (GLP-1RAs) and glucose-dependent insulinotropic polypeptide (GIP) medications in the rural counties of Kentucky, Southeast Ohio, and West Virginia. These medications are crucial for the effective management of type 2 diabetes and obesity, and this study aims to identify the barriers and facilitators to accessing these treatments in these regions. A google form was created to gather information from patients who were prescribed GLP-1RA and GIP medications. A QR code was created and posted at various community and outpatient pharmacies throughout rural counties in Kentucky, Ohio, and West Virginia. For further exposure and

an increased number of responses, the google form was shared across social media platforms. Most questions are multiple choice to shorten the response time for patients and prompt more responses. The responses will be collected after a month and analyzed.

IACUC None required, IRB exemption
Funding: None

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The Destructive Nature of Adolescent Alcohol Misuse on Tripartite Synapse Cohesion

Adolescent binge drinking impairs cognitive function in both human and animal models and increases the risk of developing an alcohol use disorder. Recent research indicates that adolescent intermittent ethanol (AIE) exposure, a rat model of binge drinking, disrupts the tripartite synapse. This is composed of a pre- and post-synaptic terminal and an ensheathing peripheral astrocyte process (PAP) that is critical in regulating synaptic function. Tripartite synapses are stabilized by several bridging proteins, e.g., neuroligin and neurexin, that are essential for maintaining synaptic health. Previously, our laboratory has shown that AIE results in a progressive loss of PAP-synaptic coupling at excitatory synapses in the hippocampus. We hypothesize that AIE disrupts the interaction between neurexin-neuroligin, driving a loss of tripartite synapse structural integrity, and subsequent PAP-synaptic decoupling.
To conduct this research, Sprague Dawley rats were subjected to AIE or water intermittently over 16 days. After various washout/abstinence periods, brain samples were collected for analysis using techniques such as adeno-associated virus (AAV) to assess astrocyte morphology and immunohistochemistry, western blotting, and co-immunoprecipitation to assess changes in bridge protein expression and interactions. The primary focus was on samples collected at 26 days of washout, as previous studies have shown the most significant uncoupling at this stage.
We will show how AIE disrupts PAP-synaptic coupling and how alterations in neurexin and neuroligin interactions contribute to this decoupling. Whether changes in astrocyte morphology contribute to the loss of physical interactions at the synapse remains to be determined and will be the focus of our future investigations.

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Esophageal and Gastric Variceal Hemorrhage Lead to Discovery of Isolated Hepatic Decompensation Secondary to A1AT Deficiency

Alpha-1-antitrypsin deficiency (AATD) is an autosomal codominant heritable cause of early-onset emphysema and cirrhosis that results in the toxic accumulation of abnormal alpha-1-antitrypsin (α1-AT) in the liver.
This case-study describes a 33-year-old male that presented with an acute upper gastrointestinal bleed and was found to have type 1 gastric varices in the fundus which were coiled. CT and ultrasound of the abdomen showed a heterogenous liver with high suspicion for cirrhosis. Labs were as follows: Hb 11.7, platelets 61, albumin 2.9, alkaline phosphatase (ALP) 29, AST 39, ALT 79, bilirubin 1.2. Endoscopic ultrasound showed abnormal echogenicity of the liver and pancreas, and biopsy confirmed cirrhosis with intracytoplasmic hyaline globules.
On further questioning, the patient revealed multiple family members developed cirrhosis of unknown origin. α1-AT levels were undetectable. Phenotyping showed the Pi*ZZ type. Based on patient's history and testing, he was diagnosed with AATD. He follows in the clinic regularly and is being evaluated for transplant.
AATD is the most common hereditary liver disease in adults and is associated with emphysema and cirrhosis in 81% and 8.5% of cases respectively. Only 3.6% of patients present solely with isolated liver involvement. Liver disease is less common than pulmonary emphysema but is the second leading cause of mortality. Accumulation of misfolded α1-AT in the liver leads to inflammation and ultimately cirrhosis.
Treatment for AATD liver disease is limited. Currently, transplant is the only treatment and curative option, but advancements in gene therapy provide hope for a possible alternative.

IACUC No IRB approval needed because this is a case report
Funding: N/A

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Achieving Stability with Dual Long-Acting Injectable Antipsychotic Medications in Treatment Resistant Psychosis, A Case Series

Adherence to medication is a major barrier in the treatment of psychotic disorders. This has improved with the development of long-acting injectable antipsychotic medications (LAIs). However, in some cases, LAIs are insufficient as monotherapy to stabilize patients to the point of discharge from the hospital setting. Some of these patients may be stabilized by using two LAIs simultaneously. In this case series, we discuss six cases where using dual-LAIs effectively helped patients achieve stability and progress toward returning to the community. The patients were hospitalized between 2021-2024 at a psychiatric hospital in West Virginia. Five were diagnosed with schizoaffective disorder and one with bipolar I disorder. The LAIs used were paliperidone and aripiprazole in three cases, and paliperidone and haloperidol in the other three. In each case, the patient had failed numerous medication trials and been involuntarily hospitalized multiple times. Two of the six remain hospitalized but are currently stable and awaiting placement. The other four were either discharged to stepdown units or home with family. Using dual-LAIs has given these patients the ability to function appropriately in a less restrictive environment. It has also helped with medication compliance, as many of them had refused oral medications at times. There is evidence suggesting that dual-LAI treatment can keep patients stable for longer periods of time. It also decreases risk of rehospitalization as well as overall length of stay, reducing healthcare costs. These cases highlight LAIs as an important psychopharmacological tool in managing psychosis and transitioning patients back into the community.

IRB None required
Funding: None

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Handshake Practices in Standardized Patient Encounters.

Background: Handshakes have been part of human greetings since the fifth century B.C. and integral part of doctor patient communication in US healthcare. Handshakes practices have been altered due to COVID-19. The purpose of this study was to determine whether inclusion or omission of a handshake between a medical student and a standardized patient (SP) has an impact on the quality of the communication, and assess SP attitudes toward handshakes.
Methods: 47 SPs attended a special grading session focusing on scoring 12 medical student SP encounters, where half of the greetings incorporated a handshake (pre-COVID-19) and half did not (post-COVID-19). The SPs received no prior knowledge that handshakes were the focus of the study. They scored the encounters using the WVSOM 7 Elements Communication Rating Form (CRF). Afterwards, the SPs filled out an opinion survey to obtain their personal preferences concerning handshakes.
Results: Higher ratings ($p<.001$) of communication skills were found in encounters with handshakes (CRF score 86) compared to encounters without handshakes (CRF score 82). The post-opinion survey indicates 43% of the SPs did not change their handshaking practices after COVID-19 with 32% stating they do not shake hands as often. Over half of the SPs did not have a preference on handshakes for healthcare provider visits or medical student encounters.
Conclusion: This research adds to the literature on patient perception and trust cultivation related to handshakes. Better understanding of the impact of handshakes on doctor-patient rapport will help guide standardized protocols that balance patient-centered care with infection control.

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Feasibility of a ketogenic medium chain triglyceride intervention for mild cognitive impairment
Background:

Approximately 10% of West Virginians over age 65 have Alzheimer's dementia (AD) and 11% of similar aged Americans have mild cognitive impairment (MCI). Research shows possible benefit of ketogenic medium-chain triglycerides (kMCTs) for AD. We assessed the feasibility of kMCTs for MCI in our clinic.
Methods:
The kMCT group took a supplement for two months. We reviewed breath acetone levels (BAc), one serum beta-hydroxybutyrate (BHB) level, and a symptom diary. The survey group comprised people who refused participation.
Results:
We present results for six participants (33% male) in the kMCT group and three (66% male) in the survey group. Average ages were lower in the kMCT group (76.5 vs. 79.6). Only 2/6 in the kMCT group completed the study with half (3/6) withdrawing due to gastrointestinal side effects. The average serum 2-hour post-supplement BHB was 2.0 mg/dL (normal 0.2 – 2.8 mg/dL). BAc pre-supplement averaged 2.7ACEs, 2-hour post-supplement averaged 3.2 ACEs and 4-hour post-supplement averaged 4.0 ACEs (>5=ketosis or approx. 5.2 mg/dL) and 4/5 (80%) had no change in mood, energy, or mental clarity. Two-thirds of survey participants agreed that caregiver availability prevented participation.
Conclusions:

Half of participants did not tolerate the kMCT supplement. In addition, overall ketone levels were low so no conclusions can be drawn as to the benefit of kMCT supplement on mental clarity. When looking at reasons for non-participation, lack of a care partner was a barrier.

IACUC 1917191
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Intravenous Tenecteplase for Acute Ischemic Stroke During Active Menstruation

We report a case of a 51-year-old female who presented to the emergency department with stroke symptoms within the time window for intravenous (IV) thrombolytic therapy. Her initial CT head imaging showed no evidence of acute changes and her CT perfusion demonstrated an area of ischemia in the left parieto-occipital region. While she had no absolute contraindications for IV tenecteplase (TNK), she was actively menstruating at the time, which could represent a relative contraindication due to increased bleeding risk from a site that would not be easily compressible. She elected to receive TNK and did not experience any adverse events after treatment was administered. At her follow-up clinic visit, her neurological deficits were completely resolved.
In the context of increasingly widespread usage of TNK, this case report highlights an uncommon but important consideration when treating acute ischemic strokes with IV thrombolytic in the female population. While no definitive conclusions should be drawn from this case, it would hopefully encourage the continued usage of TNK in menstruating females who present with stroke symptoms within the therapeutic window and with no other contraindications.

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

Background
Rural West Virginia faces significant socioeconomic and health challenges, including high obesity and cardiovascular disease rates. Improving pediatric health literacy is critical for promoting healthier behaviors as well as mitigating these risks. Our study, the Rural Pediatric Wellness Initiative, evaluated health literacy among elementary school children in Logan County, West Virginia during a summer enrichment program.
Methods
Data was collected prospectively from elementary school students for this observational cohort study at a comprehensive educational intervention in Logan County, West Virginia. Understanding of healthy habits were obtained including dietary, sleep, hygiene, and exercise. Analysis was conducted with paired t-table Chi Square and Fischer's Exact testing with a $p > 0.05$ equating to statistical significance.
Results
The participants (n = 16) identified 53.1% (17 of 32) dairy, 96.9% (31 of 32) fruit, 68.6% (22 of 32) vegetable, 84.4% (27 of 32) protein, and 31.3% (10 of 32) grain food group options. Dairy options were less frequently identified than fruit ($p=0.0002$) and protein ($p=0.015$). Grains were identified less frequently than fruit ($p< 0.001$), protein ($p< 0.001$), and vegetable ($p=0.006$). Gender didn't impact identification ($p=0.927$). Participants with BMI > 20 ($p=0.055$) and higher age ($p=0.051$) trended to greater rates of identification.
Conclusion
Gaps in understanding of food groups were identified among elementary school children. Further study and targeted interventions are needed to strengthen health literacy to promote long-lasting habits if meaningful impact on the rural pediatric population of rural West Virginia is to be made.

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Funding: Robert C. Byrd Center for Rural Health

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'Comprehensive Informed Consent': An Integrative Approach to The Psychedelic Psychotherapy Consent Process

In front of a backdrop of the ever-surging prevalence of mental health ailments, psychedelic medicine, particularly Psilocybin, has emerged as a transformative approach with great hope and promise. This project explores the psychotherapeutical potential of Psilocybin to fill a gap in conventional psychiatric therapies; and more specifically, delves into some of the ethical complexities regarding the process of informed consent. Psilocybin's effect on the brain's Default Mode Network facilitates a phenomenon known as 'ego dissolution,' which can lead to significant shifts in personal identity and autonomy. This transformative effect, in addition to the inherent subjectivity and potential unpredictability of the Psilocybin experience, further complicates the already ethically challenging process of informed consent. In an attempt to address this issue, this project advocates for a 'comprehensive informed consent' process that integrates traditional informed consent principles and practices, multidisciplinary guidelines, and innovative approaches like virtual reality simulations. By drawing parallels with the informed consent process of neurosurgical procedures, this project aims to refine informed consent practices in order to promote ethical and effective psychedelic psychotherapies. This framework furthermore emphasizes clear communication, ongoing dialogue, appropriate therapeutic touch, and cultural sensitivity to ensure that patients are well-informed and adequately supported throughout their therapy. As psychedelic psychotherapies move towards mainstream acceptance, an integrative and collaborative approach to the informed consent process is crucial to uphold ethical principles, advocate for patients, and advance towards more equitable and effective mental health care.

IRB N/A
Funding: N/A

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A Rare Case of Omental Strangulation Through the Esophageal Hiatus Successfully Robotically Assisted Repaired

A 65-year-old male presented to the emergency department complaining of severe epigastric pain and guarding on physical exam. A noncontrast CT revealed a retro cardiac lipomatous mass. MRI of the chest was ordered, which revealed an intrathoracic omental hernia through the esophageal hiatus. Intraoperatively, strangulated omentum was seen, specifically, the greater omentum herniated through the defect into the esophageal hiatus. It was then successfully repaired via a robotically assisted, laparoscopic approach.

IRB: Case Study
Funding: N/A

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Sex Differences in Rosiglitazone's Effects on Astrocytic Process Loss and Behavioral Changes After Adolescent Binge Alcohol Exposure

Adolescent binge alcohol (AIE) use impairs cognitive function and increases the likelihood of developing alcohol use disorder (AUD). Current therapies for AUD show limited efficacy in preventing relapse and in eliminating the cognitive impairment that contributes to increased relapse. Rosiglitazone (Rosi) is a peroxisome proliferator-activated receptor gamma (PPAR-ɣ) agonist that has been used to treat type-2 diabetes mellitus. Rosi is also neuroprotective, reducing neuroinflammation and astrocytic A1 polarization, suggesting that this could be a viable approach for treating cognitive impairment following AIE. Here we investigate if Rosi can recover AIE-induced perisynaptic astrocytic process (PAP)-synaptic proximity loss and investigate the correlative changes in a learning/memory-based behavioral task. Male and female Sprague Dawley rats underwent the AIE paradigm (EtOH or water). Rats then received Rosi (or vehicle) for 20 days. Rats were assessed in the contextual fear conditioning paradigm or brain tissue was collected for immunohistochemistry. Results demonstrate that EtOH and Rosi independently accelerated fear extinction in males and females, this was not attenuated by EtOH+Rosi co-administration. At the synaptic-level, males and females showed EtOH-induced loss of PAP-synaptic proximity at excitatory synapses. EtOH increased PAP-synaptic proximity at inhibitory synapses, in a sex-dependent and subpopulation-dependent manner. The effects of Rosi co-administration will also be discussed. Here we demonstrate that while Rosi may not be an effective treatment for EtOH-induced cognitive impairment, it may be an effective therapy for PTSD-related deficits. Further work is required to understand how Rosi-induced changes in synaptic architecture contribute to these effects.

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Phenazopyridine-Induced Methemoglobinemia: The Importance of Medication Reconciliation in Prompt Diagnosis and Treatment

Introduction: Methemoglobinemia is a rare condition where hemoglobin's iron is oxidized from ferrous (Fe^{2+}) to ferric (Fe^{3+}), impairing oxygen delivery to tissues and causing hypoxia. Medications, chemicals, or genetic factors can trigger it. Phenazopyridine (Pyridium), a urinary analgesic, is an uncommon cause, with only 10 cases reported between 1980 and 2018. We report a case of methemoglobinemia in a patient using pyridium for recurrent urinary tract infections.
Case Presentation: A 77-year-old male with a history of rheumatoid arthritis, vascular dementia, left-sided hemiparesis from a prior stroke, heart failure, and recent pulmonary embolism (PE) treated with apixaban, was transferred to rehab after hospitalization for acute cholecystitis. Initially discharged without oxygen, he developed persistent hypoxia at the rehab facility, requiring increased oxygen support with saturations in the 80s. A CT PE protocol showed no new embolism. In the emergency room, he was hypoxic (85% on BiPAP) but not in respiratory distress. Venous blood gas showed hemoglobin of 13.8 g/dL. Suspecting methemoglobinemia, a medication review revealed phenazopyridine use. Methylene blue was administered, improving his oxygen saturation to 95%. His condition stabilized and phenazopyridine was discontinued to prevent recurrence.
Discussion: This case underscores the need to consider drug-induced methemoglobinemia in unexplained hypoxia. Early diagnosis and treatment with methylene blue were key to improving the patient's condition.
Conclusion: Prompt recognition and treatment of methemoglobinemia are crucial in patients with hypoxia, and medication reconciliation is vital in identifying potential causes like phenazopyridine.

IRB No approval needed Case study
Funding: None

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A rare case of HSV Meningitis after Microvascular Decompression for Trigeminal Neuralgia

Trigeminal neuralgia (TN) is a paroxysmal facial pain disorder commonly caused by vascular compression of the trigeminal nerve, resulting in debilitating facial pain. First-line treatment typically involves medications such as carbamazepine. When medical therapy fails, microvascular decompression (MVD) is a surgical option that offers the highest rate of pain relief. A known complication of MVD is aseptic meningitis; however, herpes simplex virus (HSV) meningoencephalitis following MVD is rarely discussed.
We present the case of a 26-year-old male who underwent left-sided MVD for TN and subsequently developed HSV meningitis. On post-operative day (POD) 2, the patient was discharged home. By POD 6, he presented to the emergency department with fever, severe headache, and elevated white blood cell (WBC) count. Head CT showed no acute abnormalities, respiratory viral panel was negative, and the incision site was clean and intact. By POD 9, the patient's WBC count continued to rise, and his headache worsened. A lumbar puncture revealed cerebrospinal fluid (CSF) PCR positive for HSV1. The patient was promptly started on intravenous (IV) acyclovir, leading to significant clinical improvement. On POD 13, the patient was discharged in stable condition on a two-week course of oral valacyclovir to treat HSV meningitis.
This case underscores the importance of early consideration of viral causes, including HSV, in patients presenting with post-MVD meningitis-like symptoms. Early diagnosis and treatment with acyclovir is critical to preventing adverse outcomes.

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Patients Don't Read Medical Textbooks: A Case Study Showing an Atypical Presentation of Liver Pathology

Primary biliary cholangitis (PBC) is an uncommon liver disease with well-defined diagnostic criteria. We are describing a patient with an ambiguous presentation.
This case presents a 37-year-old male from West Virginia with a history of IV drug use. He came to the hospital for L5-S1 osteomyelitis. Labs showed ESR (57), CRP (8.6), pancytopenia (Hb 9.3, WBC 3.99, platelets 61), and alkaline phosphatase (ALP) of 122.
Imaging revealed splenomegaly (30.3cm) (fig 1(a)) and large nodular liver (18cm). Suspicion for viral or alcoholic etiology was high. The elevated ALP was attributed to osteomyelitis.
Viral hepatitis, HIV, and alcohol testing were negative. Anti-nuclear antibody (ANA) was positive (>1:80), anti-mitochondrial antibody (AMA) was equivocal (22.3), anti-smooth muscle antibody was negative. IgM was (412 mg/dL).
Endoscopic liver US and biopsy revealed portal hypertension, hepatic venous pressure gradient of 9, and bridging fibrosis.
Despite the patient's social history and initial presentation, we prescribed ursodeoxycholic acid (UDCA) on day 21 due to a biliary injury pattern seen on biopsy (fig 1(b,c)). ALP normalized within 4 weeks (fig 1(d)).
The patient was discharged on day 47 and followed for regular monitoring.
Positive AMA is pathognomonic (90-95% specificity) for PBC in the setting of isolated high ALP. AMA negative PBC is highly uncommon, and PBC is

10-fold more common in women. These factors underlie the challenge of this diagnosis. The assumption that this patient's pathology was solely from drug use highlights the need for all patients to receive unbiased care regardless of social determinants of health.

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High Fat Diet Derived Exosomes Mediate Stimulation of Na-Glucose Co-Transport (SGLT1) in Intestinal Epithelial Cells

Background: Obese people are 6X more likely to develop diabetes, which results from alterations in glucose homeostasis. Glucose absorption via Na-glucose co-transport (SGLT1) at intestinal villus cells' brush border membrane (BBM) is the first step in maintaining glucose homeostasis. Exosomes (EXs) secreted by adipocytes into adipose-derived secretome (ADS) are known to affect physiological functions. However, whether EXs isolated from the high-fat diet (HFD) induced obese ADS regulates SGLT1 in intestinal epithelial cells (IECs) is not known. Hypothesis: HFD-ADS-derived EXs regulate SGLT1 in IEC during obesity. Aim: Determine the mechanism of regulation of SGLT1 by HFD-ADS derived EXs in IEC in obesity. Methods: EXs were isolated from ADS. Rat small intestinal epithelial cells (IEC-18) were treated on day four post-confluence with EXs and used in determining SGLT1 uptakes, Na/K-ATPase activity, and Western blot studies. Results: HFD-ADS EXs stimulated SGLT1 in IEC-18. EXs from HFD-ADS diminished Na/K-ATPase activity in IEC-18. The mechanism of stimulation of SGLT1 by HFD-ADS EXs was secondary to increased affinity (1/Km) for glucose. Western blot analysis showed no changes in SGLT1 protein expression. However, pSGLT1 was increased by HFD-ADS EXs treatment. Conclusions: SGLT1 was stimulated by HFD-ADS EXs in IEC secondary to a phosphorylation-mediated increase in affinity of the co-transporter for glucose without change in the number of co-transporters at the BBM. The mechanism of SGLT1 stimulation by HDS-ADS EXs is identical to in-vivo in the obese intestine. Thus, the stimulation of SGLT1 is likely mediated by HFD-ADS EXs at the BBM of intestinal villus cells during obesity.

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"Not Your Usual Suspect": Gemella sanguinis – a Rare Cause of Endocarditis in a Bicuspid Aortic Valve

Infective endocarditis (IE) is an infection of the cardiac endothelium that can affect the heart valves, and is most commonly caused by S. aureus, S. epidermidis, Streptococcal species, or Enterococcal species. Gemella sanguinis is a catalase-negative, facultative anaerobic, gram-positive coccus that normally colonizes the human oral cavity and gastrointestinal tract and rarely causes infection. Gemella can be challenging to identify, and is frequently left unidentified or mistaken for Viridans group Streptococci. IE diagnosis may be delayed in patients without evident risk factors such as valve disease, congenital heart defects, or intravenous drug use (IVDU).
Here we present a case of IE, which is a well-documented diagnosis with a very rare etiology. A 50-year-old man originally presented to his primary care provider with ongoing complaints of fever for 4 days along with gradual worsening of shortness of breath, weight loss, fatigue, and leg swelling for 6 weeks. Blood cultures were taken, and he was sent to the hospital after they came back positive for G. sanguinis. He did not have any known cardiac history and had never used intravenous drugs, but did have a history of extensive dental work secondary to military-associated injury.
Echocardiography later showed he had a bicuspid aortic valve with vegetations causing moderate to severe aortic regurgitation. This patient was successfully treated with antibiotics and aortic valve replacement. This case highlights the importance of a thorough medical history, which, when combined with the clinical presentation, led to a prompt diagnosis for the patient.

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Funding: N/A

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Increased Incidence of High-Risk Prostate Cancer in Appalachian Patients: A Comparative Study with National Data

Prostate cancer is the second leading cause of cancer death in American men, with known disparities related to socioeconomic status, race, and geography. Limited research exists on prostate cancer in the underserved Appalachian region, particularly in West Virginia, which faces significant socioeconomic challenges, including lower income, education levels, and healthcare access. This study compares prostate cancer incidence and severity in Appalachian patients with national data from the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial. We retrospectively analyzed 160 first-time prostate biopsy patients from our institution (2022-2024) and compared them to 8,776 positive biopsies in the PLCO dataset (1993-

2001). Gleason scores were stratified by risk, and a chi-square test was applied to assess differences in malignancy rates. Of our population, 55% had malignant biopsies, with significantly higher rates of high-risk (20.22% vs. 6.92%) and very high-risk (14.61% vs. 6.59%) malignancies compared to the PLCO group ($p < 0.001$). These findings suggest that Appalachian patients are more likely to present with aggressive prostate cancers at diagnosis. Our study's limitations include demographic differences, varying healthcare access, and the fact that the PLCO trial data were collected over a decade ago.

Conclusion: Clinicians serving this region should maintain a heightened awareness of prostate cancer risk in patients with abnormal PSA or lower urinary tract symptoms. Our study highlights the need for targeted prevention and early detection strategies in this high-risk, underserved population.

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Vertebral Osteomyelitis from Dry-Needling – A Case Study

A 16 y.o. male football player presented with low back pain initially managed as a lumbar strain. After one month of minimal improvement, he began dry-needling sessions with his physical therapist. His pain gradually improved until he experienced a sudden worsening of his pain four months later. He previously had no documented fever but did indicate recent subjective chills during review of systems. Radiographic imaging showed endplate destruction at T12 and L1, a new finding relative to radiographs done at his initial presentation. Subsequent MRI demonstrated increased signal on T2 at the T12 and L1 vertebrae and disc space suggestive of vertebral osteomyelitis (VOM) and discitis. On admission, he was afebrile with a mildly elevated heart rate, and his labs revealed elevated WBC, ESR, and CRP, indicating inflammation. CT guided biopsy confirmed MSSA osteomyelitis. He was treated with oral clindamycin for six weeks with resolution of his pain and full return to sport.
VOM is a rare cause of osteomyelitis in children and is thought to result from hematogenous spread of bacteria via the abundant vascular channels of the cartilaginous portion of the disk space. Fever and elevated WBC are often associated with VOM, but this is not always the case. While VOM can occur spontaneously, it is important to consider this athletes exposure to dry needling a potential infectious source. As dry needling becomes more widely practiced, it is important to remember that it is an invasive procedure and patients should be appropriately counseled about the potential risks.

IRB approval not needed as this is a case study and a retrospective review.
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Changes in Astrocyte Responsivity Across Fear-Related Circuitry Following Adolescent Ethanol Exposure in Female Sprague Dawley Rats

Adolescent binge-drinking is associated with long-term disruption of neuronal and cognitive function. How non-neuronal cells contribute to these deficits remains understudied despite growing evidence that astrocytes are important regulators of neuronal function. Our previous data demonstrate that adolescent intermittent ethanol (AIE) disrupts peripheral astrocyte process (PAP)-synaptic proximity in a subregion-dependent manner and impairs Ca2+ (GCamp6f) responsivity to neuronal stimulation in vitro. This coincides with AIE-induced deficits in the contextual fear conditioning task in female rats that persists even after forced abstinence.
Here, we investigated how AIE influences astrocyte function throughout the Hipp-mPFC-AMG fear circuit and contributes to deficits in fear extinction within the contextual fear conditioning task. Female Sprague Dawley rats received AIE and intracranial injection of hM3DGq targeted to astrocytes. Following a 26 day forced abstinence period, using chemogenetic (hM3DGq+CNO) and immunohistochemistry approaches, we assessed how astrocyte activation, within the dHipp alters neuronal and astrocyte activity across the fear circuit following AIE. We found that basolateral amygdala (BLA) astrocytes selectively show reduced responsivity to dHipp astrocyte activation when compared to controls. Next, we assessed if recovery of AMG astrocyte Ca2+ activity using hM3DGq+CNO could attenuate these AIE-induced deficits in fear extinction (these data will be presented). In conclusion, these data demonstrate that activation of dHipp astrocytes can modulate astrocyte activity throughout the entire mPFC-Hipp-AMG fear network. Additional results will be presented showing the role of astrocytes in fear extinction in female rats and to determine if recovery of astrocyte activity within the AMG can attenuate AIE-induced deficits.

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The Impact of Female Estrous Cycle and Adolescent Ethanol Exposure on Fear-Related Behavior in Rats

Adolescence is a crucial period for neurological development. Binge-drinking during this period has been associated with long-term disruption of neuronal and cognitive function. Previous laboratories have demonstrated sex-dependent behavioral disruptions as a consequence of adolescent intermittent ethanol (AIE) in rodents. Our lab has previously demonstrated that AIE results in deficits in fear acquisition in the contextual fear conditioning paradigm in male Sprague Dawley rats. However, it is unknown if female rats respond differently to AIE in this task and if hormonal changes in females contribute to these differences. Here we investigated how estrous cycling influences performance in the contextual fear conditioning task and determined if AIE-induced impairment in this task correlates with disruption of estrous. On PND30, female Sprague Dawley rats received intermittent EtOH or H2O for 16 days. After a 26-day wash-out (26DWO) period, rats performed the contextual fear conditioning task or tone fear conditioning task. 8 days prior to behavioral testing, rats had their estrous cycle tracked through vaginal lavage. Lavage slides were stained using crystal violet and imaged for phase identification. Results show that females exposed to AIE have accelerated fear extinction on day 2 and 3 in the contextual fear conditioning paradigm but show no deficits in the tone fear conditioning paradigm. Estrous cycle staining is on-going and will be presented. Future studies will investigate how hormonal fluctuations throughout the estrous cycle contribute to AIE-induced cognitive deficits and influence cognitive vulnerability during the time of administration.

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Pterostilbene Reduction of Reactive Oxygen Species (ROS) Damage to Renal Proximal Tubular Epithelial Cells.

Natural products have shown promise in reducing nephrotoxicity by the cancer chemotherapy agents cisplatin and doxorubicin that generate reactive oxygen species (ROS) such as hydrogen peroxide (H2O2). Pterostilbene is a constituent in blueberries that possesses antioxidant and anticancer activity. The hypothesis for this project is that pterostilbene will reduce the oxidative stress in cells associated with cancer chemotherapeutic agents. A human proximal tubular epithelial cell line, HK2, were exposed to 0-2000 uM hydrogen peroxide (H2O2) for 24h in the presence of 0-10 uM PTER. Cells were also incubated for 24h with 0-30 uM Cisplatin in the presence of 0-10 uM PTER. All HK2 cells were preincubated 1 hour with 0-10 uM of pterostilbene and followed by 24h coincubation with 0-2000 uM hydrogen peroxide or 0-30 uM cisplatin. Upon completion of the incubation cell viability was assessed using the MTT assay and trypan blue exclusion. A minimum of 4 independent experiments were conducted for each western blot analysis. LC3B protein concentrations were evaluated for autophagy levels In HK2 cells treated with PTER and H202. 4HNE protein levels were also evaluated for oxidative stress in HK2 cells. PTER at 5 and 10 uM reduced cisplatin cytotoxicity ($p<0.05$). Based on the MTT studies, PTER reduced H2O2 cytotoxicity. Pterostilbene alone did not appear to change cleaved caspase 3. Cells exclusively treated with H2O2 did not display increased cell membrane leakage. These results indicate that PTER reduced damage by H2O2 and cisplatin.

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An illustrative case report of acute COVID Epiglottitis in the outpatient setting with Literature Review

In patients with COVID-19, common symptoms include malaise, fever, cough, dyspnea, fatigue, and myalgias. Acute epiglottitis is a rare presenting symptom for COVID-19. There are only 11 reported cases of this condition. Acute epiglottitis is an emergency that causes swelling of the upper airways leading to respiratory arrest and death if untreated. Diagnosis and treatment of acute epiglottitis must be undertaken quickly, and COVID-19 should remain on the differential as a cause for this condition.
We present a case of 36-year-old female presenting with 2-day history of sore throat, dysphagia, and difficulty speaking. associated with left ear pain that progressively worsened. Physical exam showed left sided tympanic membrane retraction, swollen tender left submandibular lymphadenopathy, and muffled voice. The posterior oropharynx was edematous, consistent with pharyngitis. Neck soft tissue CT demonstrated thickening and edematous change of the epiglottis consistent with acute epiglottitis. The patient was admitted to the hospital for close monitoring, further workup, and otolaryngology consultation. She tested positive for COVID-19 on admission via PCR. She was empirically started on ampicillin/sulbactam and dexamethasone with drastic symptomatic improvement. She was stable for discharge the day following admission and was seen a week later in the outpatient setting where she reported complete resolution of symptoms.

Clinicians should consider COVID-19 as a possibility in patients with this presentation despite initial negative work-up. Patients require emergent treatment with consideration given to infection prevention. Early aggressive treatment with steroids to reduce airway edema prevent the need for airway intervention such as endotracheal intubation.

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Assessing Project Hope for Women and Children: Success Rates of Residential Treatment in Recovery, Reunification, and Employment for Pregnant and Post-Partum Women with Opioid Use Disorder

Background: Project Hope for Women and Children (PHWC) offers specialized, evidence-based treatment for substance use disorders (SUD) among pregnant and parenting women. Over the years, it has become an alternative to incarceration in our state, reducing carceral overcrowding and increasing access to appropriate medical and mental health treatment for at-risk families in a vulnerable period of their lives. This study assesses the effect of legally mandated participation on adherence to the program.
Methods: A retrospective cohort study compared patients who enrolled from the community (self; n=27) with those admitted from or in lieu of incarceration (legal; n=32) at PHWC. Data included demographic information, program outcomes such as length of participation, child reunification and graduation rates, services used, and employment post-program. Statistical analysis was conducted using the Wilcoxon rank and Fischer's exact tests.
Results: Initial demographic and substance use metrics were similar across groups. Legal participants stayed longer in the program (137.3 vs 120.7 days; p = 0.07) and were more likely to come from outside the county where PHWC is located (85% vs 39%; p=0.001). Legal participants were more likely to be pregnant, but this difference was not statistically significant. Legal participants were less likely to have custody of their children at admission, but custody rates upon program completion were comparable.
Conclusion: PHWC's impact extends beyond its primary location. Legally referred participants are more committed to the program and have child custody outcomes similar to community participants. These insights underline PHWC as an effective model for future programs.

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Metabolic syndrome components and the risk of colorectal cancer in the Appalachian population

Background: Obesity and resultant metabolic syndrome (MeTS) are highly prevalent in Appalachia, where colorectal cancer (CRC) rates are also increased. Though an association between CRC and MeTS is recognized, no studies have yet recommended CRC screening for individuals with MeTS.
Hypothesis: The components of MeTS may be as important in CRC predisposition as entire MeTS.
Aim: To determine CRC risk among patients with one or more of the following MeTS components: insulin resistance (IR), low high-density lipoprotein cholesterol (HDL), hypertension (HTN), and hypertriglyceridemia (HTG).
Methods: This study included patients aged 18+ who received care from Marshall Health Network and the University of Kentucky (2010-2018). Log-binomial regression models assessed the effects of MeTS components after adjusting other factors (age, BMI, sex, insurance information, smoking habits, alcohol consumption, family history of CRC or inherited syndromes, inflammatory bowel disease history, and history of polyps).
Results: Patients meeting MeTS criteria had a 28% higher risk of CRC. The highest risk was seen in patients with IR, who had 1.60 times the risk of CRC compared to those without IR. Patients with low HDL, HTN, and HTG had 1.29, 1.13, and 1.17 times the risk of CRC, respectively. The combination of IR and low HDL was the most significant risk factor, with patients 2.65 times more likely to have CRC (p-values <0.001, 0.002).
Conclusions: MeTS and its components, especially IR and low HDL, are significant risk factors for CRC. Individuals with both IR and low HDL should be considered for colorectal screening, regardless of age.

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Preventing Stem Cell Aging through Epigenetic Drift with Hsp90 Inhibition in EML Cell Models

Aging results from the progressive decline of physiological processes required for continued survival. A hallmark of aging is increasing dysfunction in epigenetic patterning, known as epigenetic drift. Stem cells, which require a conserved epigenome, are especially impacted by epigenetic drift. An altered epigenome can result in improper differentiation as these cells replenish mature cells during the lifetime of a person. Progressive decline in this ability is part of age-related dysfunction. Previous research in Drosophila and murine cell models implicated heat shock protein 90 (HSP90) in modulating epigenetic gene regulation. Thus, we hypothesize that HSP90 inhibition may prevent epigenetic drift. Our lab previously showed that epigenetic drift can be induced in EML hematopoietic stem cell models through exposure to high serum concentrations. We treated EML cells cultured in hypoxia with AUY922, an HSP90 inhibitor, before inducing epigenetic drift. Flow cytometry analysis was performed to determine the concentrations of markers CD117 and Sca-1. Our results showed that EML cells treated with HSP90 inhibitor had increased levels of Sca-1 after high serum exposure. This indicates that inhibition of HSP90 can prevent epigenetic drift from occurring, as more of the cells could stay in a stem cell state. These results can be used to further understand the molecular mechanisms of aging in stem cells and inform future prevention and treatment strategies for age-related diseases.

IUCAC uses stem cells.
Funding: First2Network

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Characterization of Rare Eosinophilic Gastrointestinal Disorders (EGID) Using the TrinetX Database

There are substantial unanswered questions concerning the epidemiology and demographics of eosinophilic gastrointestinal disorders (EGIDs). We queried an electronic medical record database (TrinetX) for features of EGID. We utilized the TriNetX de-identified patient database, derived from 92 healthcare organizations, total population of 130,045,929 patients. There were no restrictions on age range. EGID were identified based on both ICD codes (eosinophilic esophagitis [EoE] K20, eosinophilic gastritis and enteritis [EoG/EoN] K52.81 and eosinophilic colitis [EoC] K52.82) as well as the occurrence of endoscopy; identified cases were queries for clinical and demographic features. We identified 77,726 cases of EoE, 6,554 cases of EoG/EoN, and 2,898 cases of EoC. Prevalence rates were 1: 1,673, 1:19,842, and 1:44,873 for EoE, EoG/EoN, and EoC, respectively. Of these patients, 5% showed multiple different EGID, with frequent overlap of EoE and EoG/EoN. EGID was enriched in non-Hispanic white individuals (79%). EoE demonstrated a predominance for males (59%) while EoG/EoN and EoC showed 46% and 45%, respectively. Mean ages were 39, 31, and 40 for EoE, EoG/EoN and EoC (p-value < 0.0001 between groups). The most prescribed medications included proton pump inhibitors for EoE, antiemetics and corticosteroids for EoG/EoN, and corticosteroids for EoC. We have identified the largest reported cohort of EGID patients (77,726 cases); our findings substantiate a rare diagnosis rate (ranging from 0.002% - 0.5% prevalence), male predominance specific for EoE, co-occurrence of these diseases, and distinct ages of the patients with EoG/EoN composed of the youngest. The identified cohort and approach provide opportunities for further research.

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An Unfortunate Fall: Knee Pain Following a Fall in an Adolescent

A 12 year old male who originally presented to an urgent care after tripping and landing on his left knee. Patient was running in PE class when the fall occurred. Patient's x-ray at the urgent care was negative for an acute fracture. Patient was noted to have patella alta at time of presentation. He was given a knee immobilizer and was scheduled for a follow up in one month. At follow up visit, he reported an inability to lift his leg, difficulty with extension of his knee, and significant pain of his knee. PE was significant for Patella alta with moderate effusion. ROM was restricted with flexion upto 90degrees and extension 0degrees. Strength was 1/5 with extension, with rest of the examination being within normal limits. An MRI of the knee showed patellar tendon rupture. Pt underwent surgical repair. Patient had improvement in range of motion and had regained flexion of his knee up to 110 degrees. Patient had also regained strength and was able to perform straight leg raise again.
Patellar tendon rupture involves a complete tear of the patellar tendon. Patellar tendon ruptures typically present following a sudden, strong contraction of the quadriceps muscle after landing from a high jump or when making a sudden change in direction at a high speed. Patellar tendon ruptures can also occur following a forceful backwards fall with the foot fixed. Typical presentation includes pain, edema, inability to perform straight leg raise and maintain a passively extended knee, tenderness of the infra patellar region, and loss of active knee extension. X-ray may reveal patella alta. MRI is the most sensitive imaging modality for diagnosis. Ultrasound can detect tendon disruption. Treatment most often involves surgical repair, except when tear is partial and knee extension is intact. Incomplete tears can be treated non-surgically with immobilization for three to six weeks with gradually advancing activity.

IACUC IRB approval not needed as this is a case study and a retrospective review.

Funding: none

Peterson J[1], Soucier C[1], Groves J[1], Cobbs J[1], Suresh A[1], Coulson A[2], Lavender C[2], and Hewett T[2].
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A Retrospective Review of Safety and Efficacy of ACL Reconstruction with Biologic and Suture Tape Augmentation

Anterior cruciate ligament (ACL) injuries are common in athletes and often require surgery to restore knee stability and function. However, current ACL reconstruction (ACLR) methods are associated with significant re-rupture rates and secondary injuries. Innovative approaches, including ACLR with biologic augmentation (BA) and suture tape augmentation (STA), aim to address these drawbacks. This study aimed to evaluate the efficacy and safety of ACLR with BA and STA.
This study retrospectively evaluated 122 patients who underwent ACLR with BA and STA between July 2018 and June 2022. Patient-reported outcome measures (PROMs), including the International Knee Documentation Committee (IKDC) subjective score, ACL Return to Sport after Injury (ACL-RSI) score, and Visual Analogue Scale (VAS) score, were collected at a minimum of two years post-surgery. Return-to-activity rates and complications, such as re-rupture and reoperation, were also assessed.
Of the 122 patients, 92 completed the follow-up assessment. Eighty-four (91.3%) patients returned to pre-injury activity levels. PROMs demonstrated high functional recovery, with mean IKDC and ACL-RSI scores of 95.1% and 92.5%, respectively. Patients reported minimal post-operative pain with a mean VAS score of 0.5 out of 10. Two patients (2.4%) experienced graft re-rupture and two others required reoperation for unrelated reasons.
This ACLR technique demonstrates promising outcomes regarding graft rupture rates, functional recovery, and return-to-activity rates, which indicates BA and STA may prove a viable solution to the challenges associated with traditional methods. Randomized controlled trials (RCTs) with longer follow-up periods may be warranted to validate these results and establish the efficacy of this approach.

IACUC 1982669-5
Funding: none

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The Risk of Venous Thromboembolism in Hospitalized Pediatric Patients with Inflammatory Bowel Diseases: A Nationwide Analysis Comparative Study

Venous thromboembolism (VTE) presents a serious risk to patients hospitalized with inflammatory bowel disease (IBD). This study compares VTE risk between hospitalized pediatric (< 18) and adult IBD patients using the National Inpatient Sample (2016-2020). Among 878,820 patients, 45,870 were pediatric. VTE types were categorized into lower and upper deep venous thrombosis (DVT) and pulmonary embolism (PE). Pediatric patients had longer hospital stays, higher rates of acute kidney injury (AKI), and more frequent central venous catheter (CVL) placements than adults. Overall, pediatric patients had a lower VTE risk (0.8% vs. 1.4%, P<0.001), including lower rates of lower extremity DVT (0.3% vs. 0.7%, P<0.001) and PE (0.02% vs. 0.6%, P<0.001), but a higher risk of upper extremity DVT (0.5% vs. 0.3%, P=0.04). Age-specific analysis showed no significant difference in VTE risk between children aged 0-6 and adults, while those aged 7-17 had lower odds of VTE. CVL placement increased VTE risk in both groups without age-related differences. These findings suggest the need for age-specific VTE management strategies in pediatric IBD patients.

IRB N/A

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Pulmonary Embolism Following Patella Tendon Repair in a High Level Athlete

Venous thromboembolism in isolated lower extremity surgery requiring immobilization is rare, occurring in less than 1% of cases. In this case, a 23-year-old male sustained a patellar tendon rupture during football practice. Magnetic resonance imaging (MRI) demonstrated a complete patellar tendon rupture. The patient's medical history revealed no history of bleeding or clotting disorders. Physical exam revealed a knee effusion, inability to perform a straight leg raise, and gapping at the inferior pole of the patella. There was no evidence of deep vein thrombosis (DVT). The patient elected for a patellar tendon repair with internal brace augmentation. Post-operatively, the patient was toe-touch weight bearing in a locked hinged knee brace with daily physical therapy. At four weeks post-op, the patient reported a cough with bloody sputum and left-sided pleuritic chest pain. Exam revealed diminished lung sounds in the left lower quadrant, normal respiratory effort, and an O2 saturation of 99%. Ultrasound of bilateral lower extremities did not reveal evidence of DVT. Chest CT angiogram demonstrated segmental and subsegmental pulmonary emboli (PE) bilaterally. The patient was treated with Eliquis 10 mg for 7 days followed by Eliquis 5 mg BID for 3 months. He recovered well and continues to progress strengthening in preparation for unrestricted return to sport. This case illustrates the risk of developing venous thromboembolism even in athletes who appear to have minimal risk

factors. Although the incidence rate is low, this case reveals the continued need to evaluate for pre-operative risk factors when deciding to prescribe VTE prophylaxis.

No IRB required
Funding: None

Lipovich J[1], Hackett J[1], Cuaranta A[2], Abdelmasseh M[2], Iqbal A[2], Nguyen T[1], Hernandez-Pelcastre J[1], King C[1], Ashley A[1], Thompson E[2], Finley R[2], Payne B[2], Gorka A[2], Montgomery G[1], Willis J[3], Kadiyala V[3], and Sanabria J[2].
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Value Assessment of Service Line Appendectomy Inclusive of a RCT for Perforated Appendectomy & Malignancy Rate at a Health Network System Over 12 Years.

BACKGROUND. More than 81/100,000 appendectomies are done per year in North America. This study aims to 1) evaluate the appendectomy service line within our Health Network System, 2) compare outcomes of medical versus surgical management for perforated appendicitis, and 3) assess the incidence of inadvertent malignancy.
METHODS. Patients (>18yo) who underwent appendectomies at a tertiary Health System were analyzed retrospectively (Jan2010-Jul2016) and prospectively (Aug2016-Dec2021) under IRB-approved protocols. A RCT assessed patients with perforated appendicitis treated with percutaneous drainage and antibiotics. Patients after 12 weeks were randomized to interval appendectomy (IA) or observation. Pathology reports were reviewed for malignancy and staged. SPSS was used for uni/multivariate analysis.
RESULTS. 1,664 patients underwent appendicectomies by MI (95%, with 3% converted to open), or by an open (2%) approach. DM, BMI, ASA>1, and perforated appendicitis were predictors of post-operative complications ($p<0.01$). ESRD, CHF and perforated appendicitis were predictors for readmission. Enrolled patients with perforated appendicitis responded to non-surgical management (n=13). The interval appendectomy group (n=7) had only low-grade PC. Distinctly, 50% of the patients in the observation group opted for surgery due to recurrent abdominal discomfort. Patients (3.4%) had malignancy in their specimen (42.9% neuroendocrine, 61.8% adenocarcinoma, and mixed/others 5.4%) with a significantly higher incidence older patients (>60yo, $p<0.05$).
CONCLUSION. Service line appendectomy in our Health Network System has above National average performance. Initial medical management of perforated appendicitis with interval appendectomy is a valued treatment. Patients >60 years old had a higher incidence of malignancy.

IRB 945673-16
Funding: None

Leonardo M[1], Gourley B[1], Kastigar A[1], Walden A[1], Sisco J[1], Salisbury TB[1], Denvir J[1], Nato Jr AQ[1], Brundage K[2], and Dickson PE[1].
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Effects of environmental enrichment and isolation housing on the striatal and hippocampal transcriptomes in genetically diverse mouse strains

Environmental factors influence a broad range of phenotypes including addiction related behaviors. Despite the impact of these phenomena on diseases such as addiction, the genetic mechanisms underlying these effects
are poorly understood. Advanced mouse populations, when used in the context of a systems genetics approach, provide the ability to disentangle these complex relationships. To this end, we used environmental
enrichment and isolation housing as models of enrichment and impoverishment to identify genetic mechanisms that interact with environmental factors to influence the striatal and hippocampal transcriptomes. As
subjects, we used mouse strains from the genetically diverse Collaborative Cross recombinant inbred panel and their founder strains (C57BL/6J, A/J, NOD/ShiLtJ, PWK/PhJ, CC002/Unc, CC005/TauUnc, CC019/TauUnc,
CC051/TauUnc). At wean, male and female mice from these strains were housed in one of two conditions: Mice from the isolated group were singly housed in a shoebox cage and provided food, water, and bedding.
Conversely, mice from the enriched group were housed in same-sex groups in large rat cages and provided enrichment items including a vertical running wheel, a horizontal running wheel above a small nesting box,
Nestlets, a Shepherd Shack, and a tube. After ten weeks in these distinct housing conditions, striatum and hippocampus were collected and bulk RNA-Seq was used to quantify gene expression. The effects of strain, sex,
housing condition, and interactions among these variables on striatal and hippocampal gene expression were assessed. These data reveal strain specific effects of housing condition on gene expression in brain regions
that are critically involved in reward, compulsive drug seeking, and addiction. Identified mechanisms may underlie environmentally induced vulnerability and resistance to heritable diseases including addiction.

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Real-world evaluation of interconsensus agreement of risk of bias tools: A case study using risk of bias in nonrandomized studies-of interventions (ROBINS-I)

Background
Risk of bias (RoB) tools are critical in systematic reviews and affect subsequent decision-making. RoB tools should have adequate interrater reliability and interconsensus agreement. We present an approach of post hoc evaluation of RoB tools using duplicated studies that overlap systematic reviews.
Methods
Using a back-citation approach, we identified systematic reviews that used the Risk Of Bias In Nonrandomized Studies-of Interventions (ROBINS-I) tool and retrieved all the included primary studies. We selected studies that were appraised by more than one systematic review and calculated observed agreement and unweighted kappa comparing the different systematic reviews' assessments.
Results
We identified 903 systematic reviews that used the tool with 51,676 cited references, from which we eventually analyzed 171 duplicated studies assessed using ROBINS-I by different systematic reviewers. The observed agreement on ROBINS-I domains ranged from 54.9% (missing data domain) to 70.3% (deviations from intended interventions domain), and was 63.0% for overall RoB assessment of the study. Kappa coefficient ranged from 0.131 (measurement of outcome domain) to 0.396 (domains of confounding and deviations from intended interventions), and was 0.404 for overall RoB assessment of the study.
Conclusion
A post hoc evaluation of RoB tools is feasible by focusing on duplicated studies that overlap systematic review. ROBINS-I assessments demonstrated considerable variation in interconsensus agreement among various systematic reviewes that assessed the same study and outcome, suggesting the need for more intensive upfront work to calibrate systematic reviewers on how to identify context-specific information and agree on how to judge it.

IACUC None required for this study
Funding: None to report

White A[1], Clark B[1], Snider W[1], Willis C[1], Fitchpatrick P[1], and Porter H[2].
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Rural Resilience: Enhancing Health in West Virginia Through Interactive Preventive Care Modules for High School Students

Background:
The Rural Resilience: A Healthier West Virginia (RRHWV) study focuses on interactive preventive healthcare modules for rural high school students. Preventive healthcare is crucial for establishing a foundation for a healthy adulthood, linked to cost-effectiveness, enhanced quality of life, and fostering lifelong healthy habits, all contributing to improved community health outcomes.
Objective:
Inspired by The Healthier Nevada Project (HNVP), RRHWV aims to enhance medical literacy and measure students' comfort in discussing health topics with professionals. The initiative will begin with Spring Valley High School in Huntington, WV, in September 2024.
Methods:
This one-month study encompasses four key modules: Substance Abuse, Physical Activity/Obesity, Adult Education, and Mental Health Services, each lasting 90 minutes. Following the HNVP model, the study will assess students' awareness, knowledge, and comfort levels regarding these topics. Data will be collected through pre- and post-assessments using RedCap for anonymous entries, with analysis involving two linear regression models to evaluate score differences.
Results/Conclusion:
The ongoing study, concluding in early October, hypothesizes findings similar to HNVP, indicating increased student knowledge and comfort in discussing health topics. RRHWV aims to create a sustainable educational module system for statewide implementation, ultimately contributing to a healthier West Virginia.

IRB1 #00002205 IRB2 #00003206. Exempt
Funding: Department of Pediatrics

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Compassion, Comprehension, Competency: A Pedagogical Approach to Providing Effective Gender Affirming Care

Gender affirming care for transgender and gender non-conforming individuals is a traditionally understudied and emerging area in the field of primary care medicine. In the ongoing effort to ensure improved access to necessary healthcare services, it is essential to equip future physicians with the skills and knowledge to effectively provide gender affirming care for their future patients. Resident physicians, who are at a critical stage in their professional development, require targeted education to enhance their competence and comfort in treating TGNC patients. This study aims to gauge the current level of resident physician education and comfort in discussing and implementing gender affirming care with TGNC patients and to augment the current curriculum by providing residents some familiarity with a systematically underserved population. Family medicine resident physicians will complete an initial cross-sectional survey to gauge their baseline knowledge and comfort levels when discussing and working with TGNC individuals. After the initial survey, an educational intervention will occur providing information on the unique healthcare needs of TGNC individuals and best practices for creating an inclusive clinical environment. Post-intervention, the same survey will then be conducted to analyze if the education intervention is effective for improving comfort levels and increasing the capacity of care given by these residents. We hope this study will contribute to the growing body of evidence supporting the need for comprehensive TGNC health education in physician training programs.

IACUC 2082318-3
Funding: N/A

Piechowski K[1], Alagha Z[2], Wright T[2], Gundakaram S[2], Bodiwala R[2], Clark B[1], Mayo A[1], Germann K[1], Maier M[1], Smith M[1], Avalishvili T[2], and Mustafa B[2].
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Apixaban and rivaroxaban for treatment of venous thromboembolism in patients with obesity and BMI ≥50 kg/m2

Background:
Direct oral anticoagulants (DOACs), including rivaroxaban and apixaban, have largely replaced warfarin for managing venous thromboembolism (VTE). However, there is limited data on their efficacy and safety in patients with obesity, and almost no data for their use in patients with a body mass index (BMI) of 50 kg/m² or greater. Given the rising prevalence of severe obesity, this study aims to evaluate the safety and efficacy of DOACs in this high-risk population.
Methods:
This retrospective chart review includes patients with BMI ≥50 kg/m² and a matched cohort with BMI 18.5-30 kg/m² who were initiated on apixaban or rivaroxaban for VTE treatment. The primary objective is incidence of recurrent VTE, either symptomatic deep vein thrombosis (DVT) or pulmonary embolism (PE), at 6 months from initiation. Secondary objectives include incidence of recurrent VTE at 12 months from initiation, incidence of PE, symptomatic DVT, or fatal PE (at 6 and 12 months), and all-cause mortality (at 6 and 12 months). We also compared incidence of ISTH major, and ISTH clinically-relevant non-major bleeding (at 6 and 12 months).
Statistical comparisons will use ANOVA tests for continuous, and Pearson's X^2 tests for categorical variables. Subgroup analyses will assess different BMI ranges, anticoagulants, and VTE types. A sample size of 840 patients (420 per group) is calculated to achieve 80% power to detect a clinically significant difference in recurrent VTE.
Results:
We hypothesize there will be no differences in incidence of VTE and adverse outcomes between cohorts. Results will be presented at time of conference and may provide insight for DOAC use in patients with severe obesity.
Conclusion:
This study will contribute to understanding the efficacy and safety of apixaban and rivaroxaban in patients with BMI ≥50 kg/m². Findings could help guide clinical decisions on anticoagulation management in this growing patient population, addressing a current gap in evidence.

IACUC 2237416-1
Funding: None

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Postpartum Depression Screening Among New Mothers: Comparing EPDS Scores with Maternal Factors

The purpose of this study is to analyze the incidence of positive Edinburgh Postnatal Depression Scale (EDS) screenings among postpartum women who did not attend a postnatal visit within four to eight weeks after delivery. We will be studying postpartum mothers over 18. The subjects will be mothers who were delivered and received prenatal care within the Marshall Health Network by Marshall Health Physicians.The incidence of positive EDS screenings in women who did not attend a postnatal visit will be directly compared to the number of positive EDS screenings in women who

attended a postnatal follow-up.
Postpartum women who did not attend their postnatal visit within the 4-8 week period after birth will be contacted via the phone to participate in a phone survey. Informed consent will be obtained verbally over the phone. The Edinburgh Postnatal Depression Scale (EDS) score will be calculated. If patients score above a 10 on the EDS or have any suicidal thoughts they will be contacted by a Marshall Health Network nurse to schedule an in-person or telehealth visit.
The results of the EDS scores will be compared to postpartum women who attended their postnatal screening within the 4-8 week window. The electronic health records will be evaluated and statistically analyzed to evaluate if there is a difference in the number of positive depression screens in mothers who did and did not attend their postnatal visit.

IACUC 2208305-1
Funding: n/a

***Bane M[1], *Suffer S[1], Cuaranta A[2], Abdelmasseh M[2], Iqbal A[2], Douglas G[2], Edwards H[2], Ashley A[2], Hernandez-Pelcastre J[2], Eckels J[2], Nguyen T[2], Tate N[2], Gillispie C[2], E. Thompson [E2], Finley R[2], Payne B[2], Gorka A[3], Willis J[3], Kadiyala V[3], and Sanabria J[2].**
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Value For Service Line Cholecystectomy Including Incidence of Malignancy at an Academic Health Network Over Last Decade

BACKGROUND. Over 1.2M/year cholecystectomies are performed in the U.S., the majority (>90%) through a MI approach. Despite faster recovery, laparoscopic procedures increase the risk of bile leaks compared to open surgery. This study aims to evaluate cholecystectomy as a service line and to assess malignancy rates.
METHODS. Quality and cost variables (Observed/Expected) were analyzed from clinical data of patients (>18 years) who underwent cholecystectomy at two medical centers (MC1, MC2) from Jan 2010 to Dec 2021, under IRB-approved protocols. Diagnoses of common bile duct injury (CBDI) and bile leak (BL) were documented and reviewed by faculty, alongside pathology reports for malignancy. Uni/multivariate analyses were conducted using SPSS.
RESULTS. Among 7,727 patients, 97.4% underwent minimally invasive (MI) cholecystectomies, with a mean age of 44.5 years and BMI of 29.7 kg/m². The male-to-female ratio was 1:2. In-patient surgery rates were 32.4% at MC1 and 14% at MC2 ($p<0.01$). Notably, 6.1% of MC1 patients received an ERCP before their cholecystectomy. At MC2, MI procedures had a higher incidence of bile leaks (2.2% vs. 0.0%) and CBD injuries (0.1% vs. 0.0%) compared to open surgery, with lower post-operative complications ($p=0.01$). Multivariate analysis identified age, BMI, male sex, CHF, and ASA>2 as significant predictors of complications ($p<0.05$), while HTN and ESRD were linked to higher readmissions. Male sex and ESRD predicted bile leaks, and COPD was associated with CBD injuries. Gallbladder cancer incidence was 0.3%.
CONCLUSION. Cholecystectomy remains a high-value procedure in our health system, with ongoing efforts to enhance outcomes in high-risk populations.

IACUC 945673-16
Funding: N/A

Burchett J[1], Keeley-Cain L[2], Johnson B[2], White CA[2], Steele K[1], Fitchpatrick P[1], and Serrat MA[2].
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High-fat diet augments linear growth in mice lacking the protease PAPP-A

IGF-1 is a key growth regulator. PAPP-A is a metalloproteinase that modulates IGF-1 bioavailability by degrading inhibitory IGF-binding proteins. Our lab previously reported that a high-fat diet increases IGF-1 activity and bone elongation rate in juvenile mice, potentially through PAPP-A. Here we used knockout mice to test the hypothesis that PAPP-A is required for diet-induced bone growth acceleration.
Wild-type (+/+) and PAPP-A knockout (-/-) mice (N=34) were weaned onto high-fat (60% fat) or low-fat (10% fat) diets at 3-weeks. Body mass, femur length and tibial elongation and proliferation rates were measured at 5-weeks and analyzed by ANOVA.
Mice on high-fat diets grew faster than those on low-fat diets with increases in body mass ($p<0.01$), tibial elongation rate ($p<0.01$), and femur length ($p<0.05$). There was a diet by genotype interaction with magnified effects in PAPP-A knockouts. Mice lacking PAPP-A on a high-fat diet were 25% larger than knockouts on a low-fat diet with 4% longer femurs. Body mass and femur length in wild-type mice on a high-fat diet (relative to low-fat) increased only 7% and 1%, respectively.
We hypothesized that PAPP-A is required for diet-induced bone growth acceleration and expected that diet would not alter growth in mice lacking this protease. Surprisingly, we found that high-fat diet augments linear growth in PAPP-A knockouts to a greater degree than in wild-type mice. Elucidating how growth effects are magnified in PAPP-A knockouts provides an exciting and relevant next step toward understanding the genetic basis of metabolic variation in response to diet in humans.

IACUC protocol 558
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Role of hyperglycemic adipocyte-derived exosomes in endothelial function

Background: Type 2 Diabetes Mellitus is primarily characterized by hyperglycemia and is a risk factor for ischemic stroke (IS). Adipose tissue dysfunction has been shown in diabetes and could be related to the outcomes of IS. Our previous study showed that high glucose (HG) promoted the release of exosomes (EXs) from adipocytes (Adp-EXs) and altered EX contents. Here, we further investigated the effects of Adp-EXs from HG condition on hypoxia/reoxygenation (H/R)-injured endothelial cells (ECs). Hypothesis: Adp-EXs from HG condition aggravate H/R-induced EC injury and dysfunction via inducing oxidative stress. Methods: Exosomes were isolated by ultracentrifugation method from human subcutaneous adipocytes cultured with normal-glucose (NG): NG-Adp-EXs or HG (25mM): HG-Adp-EXs. The incorporation of PKH26-labelled Adp-EXs with human brain microvascular ECs (HBMECs) was studied at three different concentrations and two time-points. To mimic IS in-vitro, H/R-injury on HBMECs was induced using a hypoxia chamber. Lactate dehydrogenase assay (cytotoxicity), migration assay (wound healing), tube formation assay (angiogenesis) and dihydroethidium-staining (reactive oxygen species, ROS) were performed on HBMECs after co-incubation with different EXs. Results: Adp-EXs optimally integrated with HBMECs at 5x108EX/mL concentration and 48-hour timepoint. HG-Adp-EX treatment caused about ~ 1.5-fold increase in ROS and cytotoxicity of HBMECS under H/R-injury as compared to NG-Adp-EX. Moreover, HG-Adp-EX treatment decreased the migration and tube formation ability of HBMECs under H/R-injury. Conclusion: Our data suggests that Adp-EXs from hyperglycemic conditions impair the function of HBMECs under H/R injury by triggering oxidative stress.

IACUC None needed
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Analyzing the Correlation of Expanded School Based Mental Health and County Demographics

Background
Mental health issues significantly impact K-12 students. Knowledge of student access to expanded school-based mental health (ESMH) services are not known or uniform. This project aims to analyze existing ESMH in WV schools and their correlation with youth-related demographic factors. Finding can inform ESMH programs and policy.
Methods
ESMH programs delivered were collected in 20 WV counties through interviews of school officials and categorized into school designation (elementary, middle, high schools) and ESMH tier (1- prevention, 2- early intervention, 3- treatment). These were analyzed against publicly available data including living in poverty and high poverty areas, single parent families, young children not in school, 4th grade reading and 9th grade math proficiency, delayed HS graduation, teen birth rate, and suicide rates. Correlation was by Pearson or Spearman methods with ($p<0.05$ indicating statistical significance.
Results
Low tier 2 and 3 resources moderately correlated (Rho scores) with children living in poverty (-0.48; p=0.03) and high poverty (-.049; p=0.03) areas. Low tier 3 resources also moderately correlated with teenage birth rates (-0.47; p=0.04). Low levels of correlation did not reach statistical significance for total ESMH resources and children living in poverty and high poverty areas, percentage grade 4 reading proficiency, teen birth rate, and age 10-14 suicide rate.
Conclusions
Low ESMH resources correlated with counties providing fewer resources. Increased tier 3 resources demonstrated an inverse relationship with teen pregnancy rate. Multiple lowly corelated, but non-significant findings are likely due to relatively small sample sizes. Assessments in additional counties may reveal higher correlations.

IACUC 2239287-1
Funding: None

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Wandering Spleen Presenting as an Ileus in a Pediatric Patient

Wandering spleen, an atypical etiology of abdominal pain in the pediatric population, is a rare condition characterized by splenic hypermobility due to laxity or lack of suspensory ligaments. Presentation can range from an asymptomatic palpable mass to an acute abdomen. Despite the rarity of this condition, treatment response and overall prognosis rely on early recognition. We present a case of a 3-year-old Caucasian female with no contributory past medical or exposure history presenting with a distended, firm acute abdomen, thrombocytosis, and constipation. Initial CT imaging from an outlying facility demonstrated uniform gaseous distension of the large and small bowel, leading to initial concern for ileus. However, on further review of her CT imaging, concern was raised for splenic infarction due to evidence of torsed splenic vasculature. Follow-up ultrasound demonstrated a lack of blood flow suggestive of splenic torsion. Patient was managed with urgent splenectomy with subsequent clinical improvement. This case highlights the importance of including wandering spleen/splenic infarction in the differential diagnosis for patients presenting with acute abdomen, thrombocytosis and constipation as early recognition and surgical are imperative to improve patient outcomes.

IRB N/A Case Report
Funding: N/A

Tah S, and Sangrampurkar R.
Internal Medicine WVU

Not all NSTEMIs are Acute Coronary Syndromes

Lyme carditis is a rare but important manifestation of Lyme disease, occurring in 1% to 5% of diagnosed cases. Our case is unique as it presented as an acute coronary syndrome (ACS).
We present an intriguing case of a 41-year-old female with a history of Hodgkin's lymphoma, in remission since 2008, who arrived at the emergency department with irregular palpitations, sharp chest pain, and shortness of breath. These symptoms started four days prior, with severe fluctuations in blood pressure and heart rates ranging from the 100s to the low 30s.
Initial evaluations suggested a potential ACS. Elevated troponins and a prolonged QTc interval of 530 ms on the electrocardiogram (EKG) heightened the concern. A repeat EKG revealed sinus rhythm with a first-degree AV block, which then progressed to a 2:1 AV block. This progression raised serious concerns about an ischemic process. A cardiac catheterization was performed but showed no obstructive coronary artery disease.
Despite the absence of a tick bite or rash, her outdoor activities in an endemic area prompted consideration of Lyme disease. Lyme serology confirmed Lyme carditis with positive IgG and IgM antibodies. The progression to a 2:1 AV block required immediate intervention. A transvenous pacemaker (TVP) was placed. After treatment with intravenous ceftriaxone for four days, she stabilized, and the TVP was removed without recurrence of heart block. This case highlights the importance of considering Lyme carditis in the differential diagnosis of patients presenting with atypical cardiac symptoms, especially when initial assessments rule out conditions like ACS.

IRB none case report
Funding: none

Alagha Z, Dakkak B, Mershon M, Elgrewi A, Wright Z, and Awadh H.
Department of Internal Medicine, Joan C. Edwards School of Medicine

Fungal Endocarditis in West Virginia: A 10-Year Observational Study from Marshall University Hospitals

Introduction
Infective endocarditis (IE) is a significant public health concern in West Virginia, with a 681% rise in admissions and high mortality rates. Alarmingly, recent reports on fungal endocarditis (FE) are lacking despite its mortality rates reaching 80%. This data gap, compounded by the opioid crisis and rising substance use, highlights the urgent need for investigation. This study aims to address this critical issue.
Methods
This retrospective study analyzed patients 18 and older admitted for IE at Cabell Huntington and St. Mary's Hospitals from 2010 to 2023. IE cases were confirmed through ICD-9/10 codes and chart reviews, assessing demographics, clinical characteristics, and outcomes. Pearson correlation coefficients evaluated relationships between clinical factors, while multivariable logistic regression analyzed predictors of ICU admission and in-hospital mortality.
Results:
We identified 14 patients with FE (mean age 40.5 ± 11.1 years, 65% male). Prosthetic-valve endocarditis was present in 14.3%, and 71.4% had ≥2 comorbidities. Illicit drug use was prevalent (85.7%), with 50% using heroin. Ten patients (71.4%) had isolated right-sided endocarditis. Complications included septic embolism (35.7%), shock (14.3%), and endophthalmitis (7.1%), with 28.6% requiring ICU admission. The median hospital stay was 21.5 days, and in-hospital mortality was 16.7%. Cardiac surgery was performed in 64.3%. Shock correlated with length of stay ($r = 0.5$, $p = 0.02$) and mortality ($r = 1$, $p = 0.001$). Patients with indwelling venous catheters had longer stays ($r = 0.5$, $p = 0.04$). No predictors of ICU admission or mortality

were found.
Conclusion
This study reveals a high mortality rate in FE patients in West Virginia, linked to significant illicit drug use, particularly heroin. While shock correlated with more extended hospital stays and mortality, no clear predictors were found for mortality. These findings emphasize the urgent need for more research to address our region's emerging public health issue.

IACUC 2094751-1
Funding: None

Barmak F, Numan J, Adams J, and Nolte J.
Department of Neurology, Joan C. Edwards School of Medicine

Nitrous Oxide Induced Myelopathy

Abstract:
Nitrous oxide abuse can result in irreversible neurological damage by permanently deactivating vitamin B12 molecules. It is commonly abused for recreational purposes due to its euphoric, pleasurable, and hallucinogenic effects. Widely available in the United States, nitrous oxide is often inhaled from whipped cream canisters. The prevalence of nitrous oxide abuse, known as "whip-its" or "whippets", is increasing in the United States. This substance is addictive, and the use of whipped cream is unregulated in the United States. We present two cases of nitrous oxide abuse through the use of whippets, resulting in severe combined degeneration of the spinal cord, confirmed by magnetic resonance imaging (MRI) of the spinal cord, and severe vitamin B12 deficiency with elevated methylmalonic acid and homocysteine.

IACUC Clinical case series (two cases) of nitrous oxide induced myelopathy are discussed.
Funding: None

***DeTemple N[1], *Wurst B[1], and Nolte J[2].**
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Neurology, Joan C. Edwards School of Medicine

The Appropriateness of Prehospital Stroke Notification Among Two Stroke Centers in Appalachia

Purpose:
This study aims to assess the positive predictive value of prehospital stroke alerts in identifying patients eligible for acute stroke treatments. We hypothesize that many of these alerts may be unnecessary, potentially straining hospital resources and contributing to healthcare provider burnout. Identifying regions where alerts are frequently inappropriate could lead to targeted education to improve stroke evaluation.
Rationale:
Acute stroke treatment has progressed from aspirin therapy to IV thrombolysis and endovascular interventions, making rapid identification and intervention crucial. Research shows that large artery occlusions cause the loss of approximately 30,000 neurons per second during an ischemic stroke, emphasizing the importance of timely intervention. Prehospital stroke notifications aim to expedite treatment, but we believe many notifications do not correspond to patients within the acute treatment window, reducing their effectiveness and burdening healthcare systems.
Methods:
We will conduct a retrospective chart review of patients who presented to two stroke centers within the Marshall Health Network from January 1, 2020, to June 1, 2024. Data on diagnosis, transport method, and region of origin will be collected. We aim to identify common symptoms or locations that trigger unnecessary alerts and propose tailored educational interventions for EMS and community members.
Potential Benefits:
No risks are associated with this study. We hope to improve the accuracy of prehospital stroke alerts and reduce unnecessary strain on healthcare resources.
Inclusion/Exclusion Criteria:
All patients with prehospital stroke alerts within the defined timeframe will be included. Cases lacking sufficient medical documentation will be excluded.

IACUC 2202953-1
Funding: N/A; plan to apply to Rural Health Grant

Lulek C[1], Sexton H[2], and Risher ML[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Biomedical Sciences, Joan C. Edwards School of Medicine

Blocking proinflammatory signaling using a triple KO mouse decreases acute inflammatory pain in the formalin test

Neuroinflammation and injuries are common causes of microglial activation. Interleukin I alpha (IL-1α), tumor necrosis factor (TNF), and complement component 1, q subcomponent (C1q) are inflammatory markers released by damaged microglia that lead to A1 reactive astrocytes. Studies have shown triple knock-out (IL-1α-/-TNF-/-C1q-/-) mice fail to produce A1s following attempts to activate microglia via lipopolysaccharide injection. These pro-inflammatory astrocytes are known to have implications in neurodegeneration as well as chronic neuropathic pain. Therefore, the purpose of this study was to determine if inactivating these three genes via a triple knock-out mice model would decrease inflammation in the formalin test of acute inflammatory pain. Male and female AKTO (IL-1α-/-TNF-/-C1q-/-) and wild-type (WT) mice were administered an intraplantar injection of 10 uL of 2.5% formalin in the right hind paw. Nociceptive behaviors were monitored and quantified for 60 minutes post-injection. The area under the curve was calculated for the acute phase (0-15 min; phase I) and the inflammatory phase (15-60 min; phase II). AKTO mice had an increased acute pain response during phase I and an overall decreased inflammatory pain response during phase II compared to WT controls, with the effect in phase II more pronounced in male than female mice. The findings from this study suggest the disrupting microglia-astrocyte proinflammatory signaling may reduce the severity of inflammation and offers a novel therapeutic approach for inflammatory-mediated disorders.

IACUC #740 and #804
Funding: WV-INBRE grant (P20GM103434)

Thanigaivasan C[1], Barker L[2], and Price J[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Family Medicine, Joan C. Edwards School of Medicine

Exploring the Relationship Between Funded Substance Use Disorder Programs and EMS Responses to Suspected Overdoses in West Virginia

Background: West Virginia faces a significant opioid crisis, prompting increased funding for substance use disorder (SUD) programs. Understanding the relationship between these programs and emergency medical services (EMS) responses to suspected overdoses (ODs) is crucial for evaluating intervention effectiveness.
Objective: This study examines whether there is a correlation between the number of funded SUD programs per county in West Virginia and trends in EMS responses for suspected overdoses, using data from the West Virginia Data Dashboard of Drug Control Policy.
Methods: Data on funded SUD programs were gathered from the West Virginia Data Dashboard, while EMS response statistics for suspected overdoses were collected for the past five years. Statistical analyses to stratify information collected based on sex, outcome, day of the week, age group, EMS count and whether Narcan was administered was noted.
Results: Preliminary findings indicate a significant inverse relationship between the number of funded SUD programs and EMS responses for suspected overdoses in several counties. Counties with higher funding levels tended to report fewer EMS responses, suggesting that SUD programs may positively influence overdose prevention.
Conclusions: These results highlight the importance of funded SUD programs in addressing the opioid crisis in West Virginia. The correlation between program funding and reduced EMS responses supports the need for ongoing investment in SUD initiatives. Future research will explore underlying mechanisms and additional factors affecting overdose trends.

IACUC No approval needed
Funding: No approval needed

Baumgartner L1, Ji P2, Morral M1, Redmond K3, Rupp D4, Franks AM4, and Stickler K4.
[1]Medical Student, Joan C. Edwards School of Medicine; [2]West Virginia School of Osteopathic Medicine; [2]Department of Orthopedics, Joan C. Edwards School of Medicine; [2]Department of Family Medicine, Joan C. Edwards School of Medicine

Headback Quarterback

Mostly seen in high-impact accidents, fractures of the lower cervical spinous processes, also known as Clay Shoveler's fractures, are thought to arise from one of four mechanisms: shoulder muscle contraction, hyperflexion-hyperextension of the neck, avulsion fractures associated with cervical spine dislocations, or direct injury from deforming forces at the cervical-thoracic junction. This study presents the case of an 18-year-old male who visited the outpatient Sports Medicine clinic four days following a football injury, reporting a gradual subsidence of neck pain since the incident, which was relieved with Aleve/Tylenol and ice. Upon examination, no obvious deformities or swelling were noted. Palpation revealed bilateral tenderness along the paraspinal musculature, more prominent on the left side, in addition to tenderness over the C7 spinous process. Strength, sensation, and range of motion were all intact. Imaging established a fracture of the C7 spinous process. Research has shown medical intervention primarily comprises nonoperative treatment with rest, stabilization, and NSAIDs. Surgical excision is warranted only if pain is persistent or nonunion present. The patient was fitted with a hard-sided cervical collar and restricted from any functional movement. Succeeding a one-week follow-up, the collar use was reduced to daily wear, transitioning to as-needed use after consultation with the neurosurgery team.

IACUC None required
Funding: None

Lee D, McCormick M, Vaughn B, Cole C, Sherif J, Sherif J, Rose S, / Anestis D, and Rankin GO
Department of Biomedical Sciences, Joan C. Edwards School of Medicine

The Role of Iron-Dependent Free Radical Generation in the Nephrotoxicity of 2,5-Dibromophenol

Brominated benzenes are an important part of industrial chemical manufacturing, flame retardants, and agricultural pesticides. Among these compounds, many have been shown to have nephrotoxic effects, and, because of their extensive applications, they have the potential to affect large swaths of the population; therefore, continued research into the toxic potential of specific brominated benzenes remains crucial. Previous studies have shown that 1,4-dibromobenzene (1,4-DBB) is nephrotoxic, but it is unclear if the parent compound and/or a metabolite is responsible for the toxicity. The purpose of this study was to investigate the nephrotoxicity of 2,5-dibromophenol (2,5-DBP), the primary metabolite of 1,4-DBB, and determine the role of iron in contributing to the generation of the free radicals as part of the mechanism of toxicity. In this study, isolated kidney cells (IKCs) from male Fischer 344 rats were pretreated with an iron-chelating agent (1.0 mM deferoxamine) or vehicle (dimethyl sulfoxide) before addition of 2,5-DBP (1.0 mM). Toxicity of 2,5-DBP was assessed by trypan blue exclusion and measuring changes in lactate dehydrogenase (LDH) release. After a 60-minute incubation, 2,5-DBP was found to induce cytotoxicity, and the addition of 1.0 mM deferoxamine lead to a statistically significant reduction in these toxic effects. The decrease in toxicity of 2,5-DBP following pretreatment with deferoxamine signifies that free radical generation contributes to 2,5-DBP nephrotoxicity and is contingent on the presence of free iron, at least in part.

IACUC 531
Funding: NIH Grant # P20GM103434

Poster Session 2 2:15 PM – 3:30 PM

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81	Miracle
82	Bodwala
83	McConnell
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86	Zafar
87	Saurborn
88	Saurborn
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121	Abdul-Khoudoud
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125	Stickley
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127	Avanessian
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133	Najam
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135	Najam
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144	Vijay
145	Willis
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151	Chowdhury
152	Rana
153	Benjy-Osarenkhoe
154	Ghouri
155	Seckman
156	Benjy-Osarenkhoe
157	Evans

Harris W, and McCauley K.
Holzer Health System, Family Medicine Department

Complete Abdominal Aortic Occlusion with Unexpected Physical Exam Findings.

56-year-old male, with a past medical history of coronary artery disease with multiple stent placements, peripheral artery disease with multiple stent placements, ischemic cardiomyopathy, hyperlipidemia, hypertension, and nicotine dependence, presents to the resident clinic requesting a work excuse to obtain an echocardiogram for cardiac clearance for an aortobifemoral bypass. Patient reports a recent ER visit regarding a chief complaint of significant lower extremity claudication and myalgias. CTA abdominal aorta with runoff showed complete occlusion of the abdominal aorta just inferior to the infrarenal arteries. Furthermore, occlusion of stented bilateral common iliac arteries, the left internal iliac artery, and the left external iliac artery was also noted. 70 % stenosis of the celiac artery and 40% stenosis of the superior mesenteric artery also noted. Three-vessel run off present bilaterally. Advised for transfer to tertiary care facility with vascular surgery present. Vascular surgery planned for aortobifemoral bypass, however patient signed out AMA prior to surgery. Patient pursuing outpatient echocardiogram at preset time. During clinic encounter, patient reports similar paresthesia of the lower extremities bilaterally with claudication, however not as severe as previous ER visit. Patient reports the symptoms has resulted in recent disability from current job. Denied abdominal pain, nausea, vomiting, hematochezia, chest pain and shortness of breath. Upon physical examination, patient was found to have pale and non-cyanotic lower extremities, with a +1/4 posterior tibial pulses bilaterally. Patient able to ambulate without assistance. This case illustrates severe arterial disease with an uncommon presentation of aortic occlusion with unexpected physical exam findings.

IACUC None, Case study performed.
Funding: N/A

Copley J[1], Song J[2], Mershon D[3], and Awadh H[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]St Mary's Critical Care; [3]Department of Internal Medicine, Joan C. Edwards School of Medicine

An Unusual Presentation of Human Monocytic Ehrlichiosis

Ehrlichiosis deserves increased consideration in clinical practice due to its increasing incidence. We present a rare case of Ehrlichiosis presenting with lymphocytic meningitis, sepsis, and respiratory failure.
We present a 55-year-old, Caucasian, morbidly obese female with complaints of fever, myalgia, and chest discomfort with a history of paroxysmal atrial fibrillation and tachy-brady syndrome s/p radiofrequency ablation and permanent pacemaker. After initial emergency department work-up was unremarkable, she returned three days later for persistent symptoms and diarrhea, decreased appetite, weakness, and dyspnea. She lives in a camper in a woody area and recently had 2 attached ticks.
Patient was in A-fib with RVR and hemodynamically in shock. CT head, chest, abdomen, pelvis, and echocardiogram were unremarkable. Laboratory data included moderate hyponatremia, elevated procalcitonin, thrombocytopenia, and transaminitis. Respiratory viral panel and blood cultures were negative.
A tick identified as Ixodes scapularis was removed and empiric doxycycline was initiated. Peripheral smear unrevealing, lumbar puncture performed for headache revealed elevated WBC with lymphocyte predominance and elevated protein. CSF culture and PCR were negative. Additional testing for Borrelia, Anaplasma, and Babesia was negative. PCR and antibody titers for Ehrilichia chaffeensis IgM were positive and confirmed with Karius test. Doxycycline was continued for 21 days, and patient recovered.
Ehrlichiosis is caused by obligate intracellular gram-negative bacteria that is transmitted through vectors such as the lone star tick and blacklegged tick. The main reservoir is the white-tailed deer. Incidence has more than doubled since 2000, due to increased vector range as well as increased reporting and detection.

IRB Case study
Funding: none

***Potter G[1], *Jett B[1], Abdelmasseh M[2], Cuaranta A[2], and Sanabria J[2].**
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Surgery and Marshall Institute for Interdisciplinary Research, Joan C. Edwards School of Medicine
***Equal First Authors**

Preliminary Results on The Value Assessment for Incisional Hernia Repairs Service Line at an Academic Health Network System Over 12 Years

Background: Incisional hernia repair (IHR) presents significant clinical challenges, with high recurrence and complication rates contributing to substantial

healthcare costs. This study assesses the outcomes of IHR at an academic health network.
Methods: Data from IHR patients (>18 years) were collected retrospectively (Jan 2010 – July 2016) and prospectively (Aug 2016 – Dec 2021) under IRB-approved protocols. Demographics and outcomes, including postoperative complications-PC, length of stay-LOS, and 30-day readmissions-RA, were analyzed. A follow-up survey was used to assess hernia recurrence rates. Uni- and multivariate analyses on variables were performed by SPSS.
Results: The M:F ratio of the 832 patients who underwent incisional hernia repair was 3:5 with an age of 57.8±13.9 years, and a BMI 34.56±10.1. Their comorbidities included HTN (53.3%), DM2T (22.7%), COPD (14.1%), CAD/CHF (11.4%), and 28% were active smokers. PC were observed in 16.7% of patients, with a RA of 6.4%, and a LOS of 1.6± 2.4 days. Multivariate analyses identified as predictors PVD for PC ($p<0.01$), and CHF & CAD ($p<0.05$) for increased LOS. Risk factors for RA included CHF, PVD, and smoking ($p<0.05$). From the follow-up survey (work in progress), preliminary results showed that 48.3% experienced hernia recurrence, with 11 37.9% undergoing repeat surgery. Persistent pain lasting more than three months was reported by 62.1%, and 24.1% experienced wound or mesh infections.
Conclusion: For service line incisional hernia repair, PVD was the only predictor of postoperative complications, while CAD, CHF, and COPD affected LOS. CHF, smoking, and PVD were associated with higher readmission rates. These findings highlight the importance of managing comorbidities to improve service line outcomes and reduce healthcare burden.

IACUC 945673-16
Funding: N/A

Miracle C[1], Bulan A[2], Tufts L[2], and Kilgore J[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department Pediatrics, Joan C. Edwards School of Medicine

Malaria in Appalachia? A Rare Case of Plasmodium vivax in an Adolescent Exchange Student From South Korea

Cultural globalization, including the resumption of international travel post-SARS-CoV-2 pandemic, emphasizes the importance of regional infectious disease variation, especially when considering a differential diagnosis for fever in a traveler. Prompt diagnosis is often imperative to initiate proper treatment and reduce morbidity and mortality associated with many environmental and vector-borne pathogens. The Anopheles mosquito transmits malaria in areas endemic to malaria. Malaria, while not endemic to the United States, can be seen in a traveler. This illness can be deadly if left untreated. Symptoms of malaria include but are not limited to jaundice, cyclic fever, and flu-like illness. In this case report, we describe a unique presentation of Plasmodium vivax malaria in a 17-year-old traveler from South Korea with a negative rapid malaria test. A peripheral smear from microscopy demonstrated the presence of gametocytes, which are pathognomonic for malaria. Despite the presence of a very low parasitemia (<1%), the patient was noted to have some severe features such as significant thrombocytopenia, acute kidney injury, as well as relapsed disease several months later despite adequate treatment. A high clinical index of suspicion and a detailed history allowed prompt treatment and no permanent sequelae.

IRB none, case study
Funding: none

Bodiwala R, Jai-Kumar S, Waldeck K, and Al-Farajat F.
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Medium-Chain Acyl-Coenzyme A Dehydrogenase Deficiency Manifesting in a Neonate Following Cardiac Arrest

Medium-Chain Acyl-Coenzyme A Dehydrogenase deficiency (MCADD) is an atypical etiology of cardiorespiratory arrest in the pediatric population. It is a rare autosomal recessive inborn error of metabolism (incidence is 1/20,000 births). MCADD is caused by a lower-than-normal level of medium chain acyl-coenzyme A dehydrogenase enzyme, which breaks down fat for energy. Individuals with MCADD appear phenotypically normal at birth with onset of presentation between 12 months and 3 years of age; the disorder may be asymptomatic; it is commonly characterized by lethargy, seizures and hypoketotic hypoglycemia. In most severe cases, undiagnosed MCADD can lead to cardiac arrest and death.
This is a rare condition and challenging to diagnose early in life, yet early recognition is key to treatment response and overall prognosis. We present a case of a 2-day old Caucasian male with no contributory past medical or exposure history presenting in cardiorespiratory arrest. Initial concern was for early onset sepsis versus a primary cardiac etiology. However, serial bedside echocardiograms were unrevealing for any anatomic or functional cardiac abnormalities. Initial blood, urine and cerebrospinal fluid cultures returned negative for infection, and concern was raised for an inborn error of metabolism. Newborn screen later confirmed MCADD. Patient was managed with riboflavin and L-carnitine supplementation per genetics' recommendations. This case highlights that MCADD is difficult to identify, especially within the first few days of life, and should be considered in term infants with severe hypoglycemia who are exclusively breastfed without other risk factors such as infant of a diabetic mother (IDM).

IACUC N/A
Funding: N/A

McConnell Z[1], and Ayoob R[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Obstetrics and Gynecology, Joan C. Edwards School of Medicine

Clonidine Withdrawal in a Five-Year-Old Female, a Case Study

Clonidine is an alpha 2 adrenergic agonist classically used for adult hypertension. Today it has become increasingly popular in pediatrics for conditions such as ADHD, insomnia, and anxiety. Abrupt discontinuation of clonidine leads to significant symptoms evident of an unblocked sympathetic nervous system, most notably of which is hypertension, that can last anywhere from days to weeks. Adult cases of Clonidine withdrawal syndrome are widely reported in literature, but pediatric cases are few, with one describing withdrawal symptoms for 17 days. Here we describe a five-year-old female who experienced hypertension following Clonidine discontinuation that required treatment with 4 classes of medications for multiple months.

IRB None required, case study.
Funding: None

DeTemple N[1], and Tate J[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Southern Pain and Spine, Jasper GA

Stellate Ganglion Block as a Therapeutic Approach for Atypical Complex Regional Pain Syndrome Caused by Recurrent Intramedullary Spinal Teratoma: a Case Report

This case report highlights a 51-year-old male with a history of thoracic spine pain, initially attributed to congenital scoliosis, who developed CRPS-like symptoms of the chest wall following partial resection of an intramedullary spinal cord teratoma. The patient experienced severe, neuropathic pain radiating from the right upper back and chest wall into the right upper extremity (RUE). The recurrent teratoma was confirmed via imaging, but further surgical intervention was not recommended. A series of stellate ganglion blocks (SGB) were administered, leading to an 85% improvement in pain and associated autonomic symptoms, such as allodynia, hair loss, and thermal changes, within two weeks of treatment. The patient continued to report sustained symptom relief at the six-month follow-up. While this case suggests that SGB could be beneficial for CRPS-like chest wall pain caused by intramedullary spinal lesions, further studies would be needed to validate its broader applicability. This case emphasizes the importance of early diagnosis and highlights the need for physicians to recognize CRPS manifestations beyond the typical extremity presentations. In particular, awareness of CRPS presenting in less common areas, such as the chest wall in our case, is crucial for timely and appropriate treatment. Autonomic nervous system-targeted therapies, such as stellate ganglion blocks, may be beneficial in these atypical cases.

IRB N/A this is a single case study from a private practice in GA. Patient gave informed consent prior to the work on this study and hopes his story can aid in the treatment of future patients.
Funding: N/A

Wurst B[1], DeTemple N[1], and Nolte J[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Neurology, Joan C. Edwards School of Medicine

Appropriateness of Prehospital Stroke Notification Among Two Stroke Centers in Appalachia

Purpose:
This study aims to assess the positive predictive value of prehospital stroke alerts in identifying patients eligible for acute stroke treatments. We hypothesize that many of these alerts may be unnecessary, potentially straining hospital resources and contributing to healthcare provider burnout. Identifying regions where alerts are frequently inappropriate could lead to targeted education to improve stroke evaluation.
Rationale:
Acute stroke treatment has progressed from aspirin therapy to IV thrombolysis and endovascular interventions, making rapid identification and intervention crucial. Research shows that large artery occlusions cause the loss of approximately 30,000 neurons per second during an ischemic stroke, emphasizing the importance of timely intervention. Prehospital stroke notifications aim to expedite treatment, but we believe many notifications do not correspond to patients within the acute treatment window, reducing their effectiveness and burdening healthcare systems.
Methods:
We will conduct a retrospective chart review of patients who presented to two stroke centers within the Marshall Health Network from January 1, 2020, to June 1, 2024. Data on diagnosis, transport method, and region of origin will be collected. We aim to identify common symptoms or locations that trigger unnecessary alerts and propose tailored educational interventions for EMS and community members.
Potential Benefits:
No risks are associated with this study. We hope to improve the accuracy of prehospital stroke alerts and reduce unnecessary strain on healthcare resources.
Inclusion/Exclusion Criteria:

All patients with prehospital stroke alerts within the defined timeframe will be included. Cases lacking sufficient medical documentation will be excluded.

IACUC 2202953-1
Funding: N/A

Zafar S[1], Khan M[2], Sridharan D[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Emergency Medicine, The Ohio State University college of medicine

Establishing a 3D-cardiac organoid model to understand cardiac development in vitro.

Introduction: Mammalian development is a complex process regulated by precise temporal and spatial signals from the surrounding microenvironment. Until recently, 2D culture systems were the only viable option to decipher the molecular mechanisms governing the cell-lineage commitment and differentiation which occurs during development. However, these systems do not accurately predict the actual in vivo mechanisms. Therefore, the advent of 3D-organoids has been pivotal to mimic complex intercellular interactions occurring during embryogenesis, and furthering our understanding of human development, physiology, and disease.
Hypothesis: We hypothesized that given the correct molecular signals, undifferentiatiated human induced pluripotent stem cells (hiPSCs) could mimic early cardiac development in a 3D microenvironment in vitro.
Methods: We cultured hiPSCs in ultra-low attachment 96-well plates at 5000 cells/well. The cells were treated with different concentrations of the small molecule Wnt activator (CHIR99021) followed by Wnt inhibitor (IWP4), and the morphology, function and differentiation efficiencies were assessed using light microscopy and immunostaining. We also assessed the effect of the cardiac drug, Isoproterenol (ISO) on the 3D cardiac organoid (cardioid) function.
Results: We observed initial spontaneous contractility in (5/48) cardioids on day ten of differentiation. Interestingly, the cardioids differentiated using 8μM CHIR showed the highest efficiency of differentiation (75%). Immunostaining the cardioids confirmed the presence of troponin-T and sarcomeric actitinin expressing cardiomyocytes. We observed a significant increase in cardioid contractility following treatment with 10 nM and 100 nM ISO.
Conclusions: The cardioids mimic early heart development in vitro. Further studies will provide a deeper understanding of the molecular mechanisms and cellar-interplay involved in mammalian heart development and disease.

IACUC None required
Funding: OSU Start up Funds

Saurborn E[1], Snider W[1], Edwards H[1], and Meadows C[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Obstetrics and Gynecology, Joan C. Edwards School of Medicine

Intraocular Melanoma as an initial presentation of Birt Hogg Dube Syndrome

Introduction: Birt-Hogg-Dubé Syndrome (BHDS) is a rare autosomal dominant genodermatosis that affects approximately 2 in every million people. The rarity of this disease substantially increases the complexity of its recognition and diagnosis.
Case Description: A 68 year old man presented to his yearly visit with concerns of intermittent sensations and blurriness in his left eye, prompting referral to Ophthalmology. Fundoscopic exam revealed an intraocular mass, and a diagnosis of choroidal melanoma in the left eye was made. The patient underwent radiation therapy. Past medical history is significant for colonic adenocarcinoma managed surgically. Family history is significant for a paternal uncle with prostate cancer, an additional paternal uncle with gastric carcinoma and a paternal grandfather with throat cancer. Given this constellation of findings, the patient was referred to a geneticist where a monoallelic FLCN gene mutation was detected. The patient continues to follow with Dermatology, Primary Care and Gastroenterology for continued surveillance.
Discussion: BHDS is characterized by multiple fibrofolliculomas, pulmonary cysts, recurrent spontaneous pneumothorax, and an increased risk for renal malignancies. Cutaneous symptoms include benign hair follicle tumors, such as fibrofolliculomas, trichodiscomas, and acrochordons. Patients with BHDS are also at increased risk of developing cutaneous and, in rare cases, intraocular melanoma. Additionally, it is important to incorporate a multidisciplinary approach including a geneticist to appropriately manage further workup.
Conclusion: This case further emphasizes the need for heightened clinical awareness to various presentations associated with rare syndromes to improve patient outcomes through timely diagnosis and intervention.

No IRB required as this was a case report.
Funding: No Funding Sources were provided for this abstract.

Saurborn E[1], Snider W[1], Clark B[1], Willis C[1], Edwards H[1], Cook S[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Dermatology, Joan C. Edwards School of Medicine

Uncommon Dermatologic Manifestations in Crohn's Disease: A Case Report of Dermatographism in a 23-Year-Old Female

Introduction: Crohn's Disease, a subtype of Inflammatory Bowel Disease (IBD), is characterized by chronic gastrointestinal symptoms such as abdominal pain, constipation, diarrhea, and malabsorption. In addition to these primary manifestations, patients frequently exhibit extra-intestinal complications involving the joints, skin, and eyes. The disease typically has an insidious onset, often leading to a delayed diagnosis. Consequently, healthcare providers must maintain a high index of suspicion for these extra-intestinal manifestations to facilitate timely diagnosis and appropriate management.
Case Presentation: We present a case of a 23-year-old female referred to Marshall Dermatology for recurrent rashes and oral ulcers. Upon further investigation, the patient reported changes in bowel function, abdominal pain, and recent weight loss. The patient was evaluated by Marshall Gynecology for vaginal leakage and a genital ulcer. Physical exam was negative for any evidence of a fistula. The patient was referred to Gastroenterology, to undergo a colonoscopy and endogastroduodenoscopy for workup of an inflammatory bowel disease or malabsorptive disorder.
Conclusion: This case emphasizes the critical role of identifying diverse dermatological manifestations in facilitating prompt and thorough diagnostic evaluation. Additionally, once a diagnosis is confirmed, interdisciplinary collaboration is essential to ensure patients receive appropriate screenings and comprehensive care.

IRB None Required.
Funding: None Required.

Islam M, Mukherji S, Sklioutovskaya-Lopez K, Terrell K, Stuart K, Pessoa MT, and Pierre S.
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Renal Function and Transporters in the Na/K-ATPase α1S/S Mouse Model of High Affinity for Cardiotonic Steroids

Na/K-ATPase (NKA) α1 deletion in the mouse renal proximal tubule (RPT) and porcine cells revealed an upregulation of the apical Na+/H+ exchanger 3 (NHE3), consistent with tonic inhibition of sodium and water reabsorption through NKAα1/Src receptor signaling. This pathway is activated by exposure to low concentrations of cardiotonic steroids (CTS), but the physiological impact of endogenous CTS (eCTS) concentrations on NKA/Src and renal transporters including NHE3 has not been explored.
This was tested by assessing renal function in naturally resistant NKAα1R/R mice and NKAα1S/S littermates genetically engineered to express a mutated NKAα1 with a high affinity for CTS (male; 3-6 months).
In NKAα1S/S kidneys, the expected left-shift of inhibitory dose-response curve to the CTS ouabain was noted, without detectable change of total renal NKA activity or protein content. Western blot analyses revealed increased phosphorylation of NKA α1 at Y260, consistent with an activation of eCTS/NKAα1/Src in the RPT of NKAα1S/S mice.
Metabolic cage studies revealed a significantly increased urine output in NKAα1S/S mice compared to NKAα1R/R (3.9±0.3 vs. 2.4±0.2 ml/24h; n=6, P<0.01), correlated with a significant decrease in membrane RPT NHE3 (50.8 %; n=5, P<0.05). RNA-seq analysis of NKAα1S/S and NKAα1R/R revealed the differential expression of 296 genes, primarily involved in solute transport pathways (Gene Set Enrichment Analysis).
Taken together, these results provide genetic evidence for a physiological role of eCTS/NKAα1 in the regulation of renal function in the intact mouse. The proposed novel mechanism of RPT NHE3 regulation through eCTS may serve as an adaptive mechanism during salt loading.

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Differing Management of Bilateral Distal Femur Periprosthetic Fractures in a Single Patient: Two Cases

ABSTRACT
61-year-old female with bilateral total knee arthroplasty (2010) with subsequent separate bilateral distal femur periprosthetic fractures (2020 & 2022). Treated with distal femur replacement (left) and retrograde intramedullary nail fixation (right). The self-reported outcomes and knee injury and osteoarthritis outcome scores (KOOS) were subsequently compared.
The patient reported higher pain and lower functionality with the left knee (KOOS 50%), and no lasting impact or pain with the right knee (KOOS 89%). Based on this report's data alone, it suggests that performing an intramedullary nail for distal femur periprosthetic fractures should be considered the preferred choice, even if anatomic alignment is difficult.

IRB None case study
Funding: None

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Repeated Toe Rise Exercise Decreases Achilles Tendon Stiffness.

Introduction:
Dancers face a higher risk of Achilles tendon (AT) injury than nondancers. Higher tendon stiffness has been associated with an increased risk of tendon injury and has been shown to decrease with exercise. The effect of an acute bout of exercise on AT stiffness in dancers has not been studied. We aim to measure AT stiffness using shear wave elastography to determine the effects of exercise on AT stiffness in dancers.
Methods:
Sixteen people (7 dancers, 7 nondancers) without AT injury participated in this repeated-measure study. Informed consent was obtained before testing; the Marshall IRB (IRB net#2200915) approved the study. B-mode and shear wave elastography ultrasound images of the participant's AT were taken before and after a bout of toe raise exercises. Paired T-tests were performed to test differences in relative strain, and plantar flexion strength.
Results:
Plantar flexion strength did not differ (P>0.05) between the sides, or groups before or after the exercise. The strain ratio decreased between the neutral and dorsiflexed positions on both the right (difference=0.18 ± 0.40, P=0.05) and left side (difference=0.25±0.40, P=0.02) before the exercise. After the exercise bout the strain ratio on the left side decreased (difference=0.18±0.37, P=0.01) in the dorsiflexed position but did not change on the right-side (difference=0.04±0.31, P=0.54).
Conclusion:
The decreased strain ratio indicates an increase in tendon stiffness. The single exercise bout decreased the tissue stiffness. Future work needs to determine the effect of repeated bouts of exercise on the AT.

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Funding: Marshall University Undergraduate Creative Discovery, Scholar and Research Award

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When an Ear Stimulus Triggers Cough: A Case of Arnold's Reflex

Introduction:
Arnold's reflex, or ear-cough reflex, occurs when stimulation of the external auditory canal triggers coughing via vagus nerve activation. It is often underdiagnosed, affecting 2-4% of the population, which can lead to unnecessary tests and healthcare costs. This case describes a 64-year-old woman with a significant cough and gag reflex triggered by ear manipulation, affecting her quality of life.
Case Presentation:
The patient had a 5-6 year history of coughing and gagging triggered by touching her left ear, which worsened over time and interfered with hearing aid use. Her history included chronic otitis media, hearing loss, and ear surgeries. Examination revealed a hypersensitive cough reflex when the left ear was examined, but no other abnormalities were noted. Imaging and studies, including barium swallow, endoscopy, and brain scans (MRI and CT scans), were unremarkable. Diagnosis of Arnold's reflex was confirmed based on the cough's association with ear manipulation. Gabapentin at 200 mg three times daily provided significant relief, allowing hearing aid use and improving daily function.
Discussion:
Arnold's reflex is frequently overlooked, leading to unnecessary diagnostic tests and higher healthcare costs. Recognizing the reflex, as in this case, can prevent misdiagnosis and optimize treatment. The patient's response to gabapentin highlights its efficacy in reducing vagal sensitivity, and improving quality of life. Early recognition and appropriate treatment are essential to avoid excessive testing and enhance patient outcomes.

IACUC None required
Funding: None

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Na/K-ATPase α1 Signaling is Essential to the Regulation of Cardiac Myocyte Metabolism

Two novel cellular pathways of Na/K-ATPase (NKA)-mediated regulation of cardiac myocyte (CM) metabolism have emerged. The first one is through inhibition of NKA ion motive activity and intracellular Na+ (Nai) elevation, which impairs mitochondrial fatty acid oxidation and favors a switch to glycolytic metabolism through a hypoxia-inducible factor 1-alpha (HIF-1α)-dependent mechanism. The second is through NKAα1/Src receptor signaling

function, but its role in Nai-induced HIF-1α activation and the glycolytic switch has not yet been explored.
To address this, we generated a CRISPR-Cas9-mediated knockout (KO) of NKAα1 in human ventricular cardiomyocytes (AC16 cells). In the NKAα1 KO, NKAα1 expression was drastically reduced by 65% ($p<0.001$, n=10), leading to a reduction in cellular Na/K-ATPase activity (80%, $p<0.05$, n=5), and a significant increase of 20% in Nai ($p<0.05$, n=3). Inhibition of Na/K-ATPase with ouabain to increase Nai activated HIF-1α in WT AC16. However, despite increased Nai, HIF-1α activation was not observed in the NKAα1 KO. Functionally, Seahorse analyses revealed a significant decrease in basal respiration, maximal respiration, spare respiratory capacity, and ATP production (n=5-7, $p<0.05$), consistent with impaired mitochondrial function in NKAα1KO. However, a switch/activation of glycolysis was not observed. In fact, glycolytic capacity and reserve were significantly reduced by 23% and 31%, respectively (n=5, $p<0.05$).
These results are consistent with a role of NKAα1 signaling in the activation of HIF-1α and subsequent metabolic switch following Nai elevation and mitochondrial dysfunction. Therefore, these findings may lead to new therapeutic strategies targeting metabolic dysregulation in heart failure with altered cardiac NKAα1 content.

IACUC No; only lines derived from a commercial line were used for this study.
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Maternal THC use trends in the face of increasing recreational legalization

Over the past decade, marijuana use has increased across many demographics as legalization has spread nationwide. Research has shown many potential deleterious effects on neonates exposed to THC in utero. This is important to address as the full breadth of the effect of maternal THC use on neonatal health remains unknown and could lead to increasing demand for neonatal care in NICUs. The purpose of our research is to analyze the rates of THC and illicit drug use during pregnancy over time. More specifically in Kentucky, Ohio, and West Virginia, where historically recreational use was illegal and the opioid epidemic has been particularly devastating.
This is a retrospective chart review of all women who were admitted for delivery at Cabell Huntington Hospital (CHH) between January 1, 2013 and March 31, 2024 who had positive urine drug screens (UDS) for marijuana or other illicit drugs. Charts with positive UDS THC findings are reviewed for further demographics including mother and infant's MRN and FIN, maternal age at delivery, ethnicity, state of residence, insurance type, UDS results, length of stay, infant's gestational age at birth, birth weight, birth length, BMI, umbilical cord or meconium toxicology, neonatal NAS treatment, length of hospital stay. Our hypothesis is recreational marijuana use during pregnancy has increased with increasing legalization. We also hypothesize that use of other illicit drugs during pregnancy will be decreased as marijuana use becomes more prevalent.

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Funding: NA

Johnson K[1], Baxter J[1], Kisling P[1], Preston D[1], Kapourales S[1], Plumley J[1], Lauffer A[2], and Dameron L[1].
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Learning & Implementing Guidelines for Hyperbilirubinemia Treatment- LIGHT (AAP VIP LIGHT)

BACKGROUND: The American Academy of Pediatrics (AAP) implemented the new Clinical Practice Guidelines to improve current care of hyperbilirubinemia in the newborn infant, born 35+ weeks gestation. This was part of their quality improvement initiative.
SPECIFIC AIMS: Improve management of infants ≤14 days of age who receive inpatient phototherapy, to decrease subthreshold phototherapy, obtain direct antiglobulin test (DAT) in appropriate circumstances, decrease unnecessary rebound testing, and decrease unnecessary IV fluid use.
METHODS: Retrospective review of patient charts of infants born at Cabell Huntington Hospital over a 2-year period (pre-initiation from February 2022 through January 2023; post-initiation from February 2023 through January 2024). Data was entered into REDCap database for analysis.
RESULTS: Our institution had 245 eligible infants; none requiring exchange transfusions. Early detection and initiation of subthreshold phototherapy was 62% pre-implementation and 59% post-implementation. Post-implementation DAT increased from 88% to 100%. Unnecessary rebound testing remained the same at 0%. Unnecessary IV fluid use had confounding results due to use of fluids for glucose control and other purposes were not considered in the REDCap database; however, the average pre-intervention was 39% and post-intervention, 22%. Additionally, readmission for inpatient phototherapy treatment decreased following intervention from 10% to 5.4%.
CONCLUSION: Following the implementation of LIGHT, our institution showed improvement of detection and management of neonatal hyperbilirubinemia, leading to less readmissions for inpatient phototherapy. Key outcomes were subthreshold initiation of phototherapy, reduction in unnecessary IV fluid use, proper DAT obtainment, and minimal unnecessary rebound testing.

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A Genome-Wide Association Study Reveals the Impact of Evolutionarily Conserved Genes on Telomerase Activity in Arabidopsis thaliana

Telomeres are repetitive DNA sequences at the termini of linear chromosomes which protect Eukaryotic genomes from damage and illegitimate double-strand break repair. The length of telomeres is an important biomarker for aging and aging-associated diseases, including cancer. The principal factor which acts to increase telomere length is the telomerase enzyme, a reverse transcriptase complex which is conserved across most Eukaryotes. Dysregulation of telomerase activity is a conserved phenotype of most human cancers, yet the specific factors which modulate telomerase activity in vivo are mostly unknown. We employ the model plant Arabidopsis thaliana, which is characterized by the presence of over 1000 natural geographically distinct populations that can be used for genomic screens. By combining this resource with a high throughput qPCR-based method to measure in vitro telomerase activity in 149 genetic backgrounds, we performed a Genome-Wide Association Study to map genetic polymorphisms underlying natural variation in telomerase activity. We have identified a number of polymorphisms localizing to genes that have human orthologs across a wide range of biological functions including ribosomal proteins, RNA polymerase subunits, and transcription factors, including the conserved CTC1 gene. Loss of function mutant analysis is underway to characterize novel genes which regulate telomerase activity.

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In Vitro and In Vivo Antifungal Peptoid Activity Against Candida auris

Invasive candidiasis is a serious fungal infection caused by Candida species which can
enter the bloodstream and affect major organs, particularly in immunocompromised patients. Recently discovered Candida auris rapidly develops resistance to antifungal treatment and kills roughly one in three infected patients, posing a significant public health threat. Resistance to the few existing antifungals and their associated toxicity necessitates new antifungal therapies. Host defense peptides (HDPs) demonstrate intrinsic, broad-spectrum antifungal properties with little resistance, but manufacturing cost, protease vulnerability and limited bioavailability render them impractical. One novel alternative exists in host defense peptide mimetics known as peptoids. We studied in vitro activity of eight peptoid compounds, oligomers of N-substituted glycines which mimic the antimicrobial peptide, LL-37, a cathelicidin. Our aim was to establish these peptoid compounds as a potential treatment of invasive candidiasis. Peptoids were tested against ten C. auris strains and five other Candida species using MIC, MFC, synergy, resistance, and time-kill kinetics assays. In vivo efficacy was examined in an immunocompetent C57Bl/6 female mouse model of systemic infection. Mechanistic activity was visualized using TEM and fluorescent confocal microscopy of peptoid against C. auris clinical isolates 381 and 382.

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Targeting NKAα1/Src signaling in the mouse renal proximal tubule using lentivirus-mediated delivery of the Naktide sequence: Impact on renal function

Activation of the basolateral Na+/K+-ATPase (NKA) is classically known for generating the Na+ gradient that drives apical Na+ reabsorption through Na+/H+ exchange (NHE3) in the renal proximal tubule (PT). In contrast, activation of NKA receptor function triggers a redistribution of apical NHE3 that decreases transcellular Na+ flux and diuresis. Mice with PT-targeted reduction of NKA by 70% have decreased diuresis and natriuresis, suggesting a predominant physiological impact of NKA signaling in the intact mouse, but the mechanism has not been probed.
This was investigated in male and female C57Bl6 mice (12-weeks-old) injected intraperitoneally with vehicle (PBS) or a lentiviral vector designed to confer stable gene expression of NaKtide (a peptide derived from the NKA signaling sequence that disrupts NKA/Src signaling) or a scramble sequence under the control of the PT-specific SGLT2 promoter. Seven weeks post-infection, urine was collected using metabolic cages and systolic blood pressure (SBP) was measured via tail-cuff. NaKtide expression was confirmed by immunofluorescence in kidney cryosections.
PBS or Lenti-Scramble injections did not modify urine output or SBP in mice of either sex. Compared to Lenti-Scramble, Lenti-Naktide did not modulate

urine output (1.7±0.2, n=9 vs. 1.8±0.2 mL/24hr, n=9) or SBP (119.9±6.2 vs.112.1±1.5, n=8 mmHg, n=8) in males. In females, Lenti-Naktide did not modify SBP (118.0±1.1, n=4 vs. 117.0±0.9 mmHg, n=4), but it significantly decreased diuresis (1.2±0.2, n=10 vs. 1.9±0.2 mL/24hr, n=8, $p<0.05$). These results suggest a sexual dimorphism of the PT NKA/Src receptor function, a potential new target in the regulation of renal water and sodium handling.

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Trauma Center Guidelines and Effects of a Two-Hospital Split System Designed to Function as Single Level II Trauma Center on Patient Outcomes

Development of a US trauma system with defined standards and guidelines has long been an established priority within the field. Although, there has been no nationally agreed upon or unifying designation process. The current system leaves coordination and designation of trauma care to a state level legislative or regulatory authority, which significantly varies between states.1 In an effort to move toward a nationally recognized trauma system, The American College of Surgeons Committee on Trauma (ACS COT) has since designed the Verification, Review, and Consultation (VRC) Program, which aims to provide an objective, external review of institutional capability and performance. Additionally, the ACS has published “Resources for Optimal Care of the Injured Patient” in which trauma levels are defined by specific standards.2 This includes patient volume criteria with a requirement of at least 1,200 trauma patients per year or at least 240 trauma patients with an Injury Severity Score (ISS) greater than 15 per year to meet Level I trauma center designation.2 Furthermore, Level I and II trauma centers must have a dedicated operating room prioritized for fracture care in nonemergent orthopedic trauma in order to provide timely fracture care for patients. Prior literature has previously demonstrated ACS trauma center designation to have a positive impact on both hospital performance and patient outcomes. DiRusso et al. Showed a significant decrease in mortality and length of stay with estimated cost savings over $4k/patient following ACS verification in a previously state-designated regional trauma center.3 Brown et al found Level II centers to have a disproportionately high observed to expected (O/E) mortality ratios with ACS verification being an independent predictor of survival.4 Additionally, transitioning from Level II to Level I has resulted in lower overall complication rates and fewer patients requiring ICU admission.5 In this study we will evaluate outcomes of a single Level II trauma center designed as a split system between two nearby, but geographically distinct hospitals. We will present data on patients requiring transfer within this split system and include specific case examples which highlight the effects of this system design.

IRB N/A
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Trends in Hospitalized Gastrointestinal Cancer Patients: A Decade of Evolving in Care, Costs, and Outcomes (2011-2020)

The landscape of gastrointestinal cancers (GI-Ca) has evolved over the past decade with advancements in treatment and palliative care. This nationwide analysis examines hospitalized GI-Ca patients, aiming to highlight changing epidemiological patterns. Methods: The National Inpatient Sample (NIS) data from 2011 to 2020 was utilized, and patients with GI-Ca were identified. Our outcomes were length of hospital stay (LOS), hospital charges (adjusted for inflation to 2020), in-hospital mortality, discharge to nursing homes (NH), and palliative care use. 2011 served as the baseline with colon cancer as the reference. Results: During the study period, 5,411,191 patients with GI cancers were admitted. Colon cancer was most prevalent, accounting for 47% of GI-Ca admissions. LOS decreased in most cancers, except liver cancer, which increased by 0.52 days (95%CI 0.32-0.83). Hospital charges increased for all GI-Ca, with colon cancer charges rising by $25,032.57 (95%CI 20,463.09-29,602.07). The odds of hospital death remained unchanged and odds of discharge to NH either decreased or remained unchanged for all GI-Ca except liver cancer, which increased with an odds ratio of 1.67 (95%CI 1.41-1.98). There was a significant drop in NH discharges between 2019 and 2020, attributed to the COVID-19 pandemic. The utilization of palliative care consults significantly increased for all GI-Ca patients. Conclusion: Overall, this national analysis reveals that GI-Ca hospital admissions remained steady from 2011-2020. However, despite reduction in LOS, unchanged hospital mortality, and increased palliative care use, hospital charges significantly increased. Further research is needed to optimize care and enhance cost efficiency for GI cancer patients.

This project used the National Inpatient Sample, which is an unidentified, publicly available data from the Healthcare Cost and Utilization Project, and it is exempt from any IRB approval.
Funding: No funding was necessary.

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First Responder Nutrition: Evaluating Nutrition Habits During-Shift versus Off-Shift

First responders often work long hours and busy shifts, which can be a barrier to healthy nutrition habits (Sotos-Prieto, et al., 2019). The purpose of the study was to evaluate nutrition habits of first responders during shift versus off shift. 100 first responders from four local agencies (fire departments and Emergency Medical Services) in West Virginia completed an anonymous 25-question online survey with self-reported nutrition intake rating scale questions comparing during-shift versus off-shift. Paired samples t-tests showed statistically significant differences between during-shift versus off-shift eating behaviors for water intake ($p < .001$), caffeine intake ($p < .001$), gas station/fast food ($p < .001$), junk food ($p < .001$), cooking one's own meals ($p < .001$), eating less than 3 meals per day ($p = .046$). In addition, paired samples t-test showed that compared to during-shift, participants reported eating more vegetables ($p < .001$), dairy ($p < .001$), grains ($p = .012$) during off-shift. There were no differences between during-shift and off-shift in protein consumption or calorie consumption. Consistent with the study hypothesis, participants reported lower water intake, higher caffeine intake, and higher consumption of junk food during-shift compared to off-shift. Participants were less likely to cook their own meals during shifts and were more likely to purchase food from a gas station. Those off-shift reported diets with higher consumption of vegetables, dairy, and grains. The study findings can contribute to inform programming for first responders, including nutrition education and addressing practical barriers to healthy nutrition habits, especially during shift.

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Social Media Use Increases Anxiety and Pain with Office Intrauterine Device Insertion

Intrauterine devices (IUDs) are safe and effective for contraception; however, social media platforms often contain content that portray negative IUD experiences and inaccurate information. The purpose of this study was to evaluate how social media use impacts anxiety and pain scores among patients undergoing an IUD procedure in the office.
Subjects presenting to Marshall Health OB/GYN for first-time IUD insertion were recruited for this study. All types of IUDs (Mirena, Kyleena, Skyla, Liletta, ParaGard) were included. Subjects completed a survey evaluating daily social media use and anticipated pain and anxiety scores by visual analog scale (VAS) of 0-10 prior to IUD insertion. The survey also asked about reproductive health (prior contraceptive use, sexual activity and pregnancy). IUD insertion occurred as standard of care. Within 15 minutes of IUD insertion, subjects competed another VAS about post-insertional pain.
133 subjects were recruited with mean age of 22.8 and range of 13-45. Most subjects reported using social media 1-3 hours per day (41.4%) and 27.8% reported 3-6 hours per day. Of those using social media, 78.9% reported seeing posts about IUDs, with 67% seeing negative content about IUDs. Adolescent age, prior sexual activity and prior pregnancy did not impact anticipated pain or anxiety scores. Seeing negative posts about IUDs statistically increased anticipated pain and anxiety scores (6.9 vs 5.4, p=<.001, and 6.8 vs 4.8, p=<.001). Using one way ANOVA, with each incremental change in time spent on social media, mean anticipated anxiety and post-insertional pain scores increased significantly (p =< .001).

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Self-Curated Personalization of Medical Education in an Appalachian Medical School: Insights for Development of Artificial Intelligence Tools

Introduction
Our study explores the use of third-party resources and artificial intelligence (AI) in medical education, focusing on their impact on academic performance.
Methods
We surveyed second-year medical students from Marshall's Joan C Edwards School of Medicine Class of 2026, correlating their self-reported resource use with exam scores. Additionally, we assessed the financial burden of these resources, finding that most students spent over $1200 annually on an average of ~6 different resources.
Results
Our results indicate that students who used < 5 resources did not score significantly different from those who used > 5 resources. The only resource

correlating with higher exam performance was Pathoma – a pathology textbook and video tool – with mild improvement (~5.8% increased scores, 95% CI ± 2.3%) in Human Hormone and Reproductive lecture exams. Otherwise, use of specific resources (Anki flashcards, AI chatbots, Sketchy, First Aid, USMLE Rx) correlated sporadically with decreased scores on certain exams. Total spending on resources tended to correlate negatively, though insignificantly, with exam scores – with, for example, a decrease in ~1% on the first Gastrointestinal and Nutrition lecture exam for every $100 spent on third-party resources.
Conclusions
We interpret that students tend to self-curate resources that match their individual learning styles but are driven to purchase many resources to explore available options, resulting in time and attention devoted to unhelpful resources. Our findings suggest that generative AI could play a role in curating and consolidating resources more effectively, potentially reducing both the financial burden and the overwhelming variety of third-party resources.

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DeSchepper K[1], Redmond AN[1], Lulek CF[1], Maulik M[1], Johnson K[1], Guindon J[2], and Morgan DJ[1].
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Desensitization and Internalization-Resistant Eight Point CB1R Mutant Male Mice Display Less Time Spent Exploring a Familiar Object Compared to Internalization-Resistant Six Point CB1R Mutant Male Mice

Cannabinoid therapeutics are being used as a treatment option for a variety of pain and psychiatric conditions, but long-term use leads to the development of tolerance to the analgesic effects as well as impairments in memory and cognition. These side effects are a potential drawback to their application as a pain-relieving therapeutic for chronic conditions. Signaling activated by agonist binding triggers downstream signaling and desensitization and internalization of the cannabinoid receptor 1 (CB1R). The C-terminus tail of CB1R functions as a regulatory domain for receptor desensitization and internalization. Eight point mutant (8PM) mice express serine/threonine to alanine point mutations for eight putative G protein-coupled receptor kinase (GRK) phosphorylation sites in the C-terminus tail of CB1Rs that are necessary for both desensitization and internalization. These mutations make the CB1Rs completely unable to recruit β-arrestin which causes the CB1R to be resistant to desensitization and internalization, trafficking, and resensitization. The goal of this study is to examine the effect of CB1R desensitization and internalization on sensitivity to the antinociceptive and hypothermic effects of cannabinoid agonists as well as assessing recognition memory in 8PM mice expressing a desensitization- and internalization-deficient form of CB1R. A cumulative dose response curve and a 10 day daily tolerance protocol was used to measure the acute response to CP55,940, a strongly internalizing cannabinoid agonist and THC. Antinociception was measured using the tail-flick test and cannabinoid-induced hypothermia was examined by recording core body temperature. Recognition memory was evaluated using the novel object recognition (NOR) test where novel object recognition was determined by measuring time exploring a familiar versus a novel object placed in the test arena. 8PM mice show decreased hypothermic body temperature to the effects of CP55,940 compared to wild-type controls days 3 and 5 of the daily tolerance experiment. 8PM male mice also exhibited a decrease in time spent with the familiar object compared to the 6PM male mice in the novel object recognition memory test. Data from this study reveal that the hypothermic effects of CP55,940 were enhanced in the 8PM male mice suggesting that CB_1R desensitization and internalization, trafficking, and recycling in males may be important pieces involved in the response to cannabinoids. This data also shows that drug naïve male eight point mutant mice spend less time with the familiar object in the recognition memory test compared to drug naïve 6PM males, indicating a possible role for CB1R desensitization and internalization in cognitive processes and memory impairment. Overall, these results suggest that CB1R desensitization and internalization may be a crucial regulator of responses to cannabinoids as well as playing a role in memory formation and recall pathways.

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Renal Changes induced by the Flavoring Agent Menthol

There is a general lack of information regarding the adverse effects of flavoring agents contained in E-cigarettes and vaping devices. This is a health concern as the usage in teenagers and young adults is increasing. One very popular flavoring agent is menthol. Inhaled menthol readily distributes beyond the lung to plasma and many organs. The purpose of this project was to evaluate the effect of menthol on renal proximal tubular epithelial cells. The overall hypothesis was that menthol cytotoxicity is mediated by inducing mitochondrial damage. Renal human proximal tubular epithelial (HK-2) cells were plated and equilibrated for 48h. Cells were next incubated with 0-1500 uM menthol for 24h. Studies were conducted as 4 independent experiments with different cell passages. Differences between groups were evaluated using ANOVA followed by a post hoc test. Cytotoxicity was assessed using the MTT assay in which viable cells convert MTT to formazan. Menthol (200-1500 uM) reduced viability of cells based on the MTT assay compared to vehicle control ($p<0.05$). Protein expression of the autophagy markers LC3BI/II) revealed an increase in LC3BII by 1500 uM menthol but no difference at the lower menthol concentrations relative to control. Additional studies examined mitochondrial function following a 24h exposure

to menthol. Basal and maximal mitochondrial oxygen consumption rate (OCR) were decreased beginning with 200 uM menthol when compared to vehicle control. This study indicated that menthol exposure of HK-2 cells induced mitochondrial impairment and higher concentrations stimulated autophagy.

IACUC Not applicable, commercial cell line used
Funding: NIH Grant P20GM103434

Andrick E[1], Naylor J[1], and Timmons M[2].
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Head Rotation Decreases Scapular External Rotation during Arm Elevation.

Background: Scapular kinematics are affected by arm elevation, the scapula experiences upward rotation, external rotation, and posterior tilt arm elevation. Reduced upward rotation, posterior tilt and external rotation have been associated with increased risk of should injury. Previous studies have described scapular kinematics with no cervical rotation. The current study tested the hypothesis that head rotation will produce scapular kinematics associated with the development of rotator cuff injury.

Methods: Eleven participants without shoulder injury took part in the investigation, all provided written informed consent. Motion tracking sensors were attached to the participant. Participants then performed 2 bouts of 5 unilateral arm elevations with their left and right arms during each bout the participant was instructed to keep their head rotated to the right or left. Repeated measures ANOVA was used to tested difference in scapular position by arm elevation angle and head position.

Results: When the head was rotated away from the elevating arm the scapula was in greater internal rotation than when the head was rotated towards the elevating arm (P=0.01) for both the right and left arm. Scapula posterior tilt and upward rotation was not affected by head position.

Conclusion: Head rotation away from the elevating arm increase internal scapular rotation. This is a scapular position associated with the development of shoulder injury. Many occupation and sport actives require look away from an elevating arm. Future work needs to be completed to test the relationship between head position and shoulder injury.

IRBNet ID# 1958817-2
Funding: none

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Trunk Rotation During Arm Elevation Increases When the Head is Rotated Away from the Elevating Arm.

Context: Movement of the arm is associated with trunk motion during arm elevation. When an arm elevates the truck rotates towards the elevating arm. The effect of head rotation on trunk rotation during arm elevation has not been sufficiently studied. The current study tested the hypothesis that during arm elevation the trunk rotates towards the elevating arm.
Methods: Sixteen (16) participants without shoulder injury were recruited. The participants' trunk rotation was measured using electromagnetic tracking. Participants performed 2 bouts of 5 right arm elevation with their head turned towards their right or left. Repeated measures ANOVA was used to test the effect of head position on trunk position during arm elevation.
Results: When looking towards the right the trunk started in 3.5° right rotation and while looking left 8.2° left rotation. During elevation of the right arm the trunk rotated towards the right. Greater right rotation(P=0.004) was found when looking towards the left (6.1°±2.8°) than right (1.7°±3.1°). Trunk lateral flexion did not change during arm elevation (P>0.05). Trunk extension increased during arm elevation (2.2°±0.61°, P=0.008), head rotation did not affect trunk flexion.
Conclusion: The data shows that trunk rotation is seen in arm elevation with opposing head rotation but not with head rotation towards the same side as arm elevation is occurring. Further exploration of this topic can lead to greater understanding of the mechanisms leading to shoulder injury.

IRBNet ID# 1958817-2
Funding: none

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FLAIR Vascular Hyperintensity as a Marker of Incomplete Recanalization in Acute Ischemic Stroke Post-Thrombectomy

Stroke remains a prevalent cause of hospitalization in the United States, often leading to significant functional impairments and mortality. Imaging plays a critical role in managing and prognosticating stroke patients. The MRI fluid-attenuated inversion recovery (FLAIR) sequences reveal vascular status through flow voids, with FLAIR vascular hyperintensity (FVH) indicating slow blood flow near arterial occlusions. Previous studies have shown FVH's correlation with clinical outcomes, but its utility in post-endovascular intervention patients remains underexplored.
This study aimed to validate the correlation between FVH, assessed by a single reviewer, and reperfusion quantified as thrombolysis in cerebral infarction (TICI) scores after thrombectomy, using a larger sample size and a different interpreter. We conducted a retrospective review of around 18 additional acute ischemic stroke patients who underwent endovascular thrombectomy and had subsequent MRIs. Each MRI was evaluated using a novel FVH scoring system focused on three key anatomical slices in the middle cerebral artery region. FVH scores were calculated based on the number of hyperintensities observed.
Exclusions were made for patients without post-procedure MRIs, those who received thrombolytics before thrombectomy, and those with basilar artery occlusions. Statistical analysis showed a Pearson's product moment correlation between the FVH and TICI scores of -0.55 (95% confidence interval -0.70 to -0.36). This was found to be highly significant with a P value of 0.000002 – confirming the previously established correlation between FVH and TICI scores. Future research should further explore the relationship between FVH scores and clinical outcomes in post-thrombectomy patients, reinforcing FVH's potential role in prognostication.

IRB# 7285
Funding: N/A

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The impact of infections with Gram-negative bacteria on telomere length in mice.

Telomeres are conserved structures at the ends of linear eukaryotic chromosomes that promote genome maintenance and regulate cellular lifespan. In humans, telomere length (TL) shortens in most dividing somatic cells and can also be negatively affected by psychological, environmental, and oxidative stress. However, TL responses to metabolic diseases and bacterial infection are less well-understood. In this study, we maintained 8-week-old male TALLYHO (TH) mice (a polygenic model of type 2 diabetes with moderate obesity) on a standard chow, or on a high fat diet (HFD) (45 kcal% fat) for additional 8 weeks to induce diabesity. Analysis of TL in circulating peripheral blood leukocytes using qPCR showed that the average TL in adult 10-week-old TH mice is 6.2 kb. After just 6 weeks of feeding, TL remained stable in animals maintained on chow but decreased by 32% in HFD mice. We next orally infected a subgroup of 16-week-old HFD mice with 106 colony forming units of fully virulent Salmonella enterica serotype Typhimurium. The infected animals fell into two distinct subgroups. The first group of animals appeared resistant to infection. However, TL in these mice shortened by 4 kb in comparison with the uninfected animals. The second fraction of the infected animals was very susceptible to Salmonella, became severely sick, and were characterized by an unexpected and significant increase in TL. Thus, our study uncovered a unique set of unanticipated and compounding effects of the interaction between major stress factors (obesity and pathogen infection) on telomere length.

IACUC 753
Funding: WV-INBRE Chronic Disease Research Program (NIH P20GM103434)

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Preferred Treatment Formulation For Headache Preventative Therapy

This research project aims to evaluate the effectiveness of surveying patient openness to preventative headache treatments in a headache clinic. The survey will be administered to patients prior to seeing the physician, assessing their willingness to consider treatment options, including nutraceuticals, neuromodulation devices, oral prescriptions, self-administered injections, IV infusions, and chemodenervation. The patient cohort will consist of adults with headache disorders who attend a headache clinic.
The goal of this study is to determine whether providing patients with details of treatment options through a pre-visit survey influences their treatment decisions, leads to faster initiation of care, and encourages them to try therapies they had not previously considered. Proper patient education is critical for improving treatment adherence, patient outcomes, and reducing the frequency and severity of headaches. The study will focus on patient preference of treatment options by completing the survey.
Empowering patients in the decision-making process when designing a medication regimen that considers their preferences, including formulation and other key factors, is likely to improve treatment adherence. By focusing on options that align with patient preferences, physicians can optimize consultation time. We hypothesize that this approach will lead to higher compliance, which is crucial in the management of headaches. This study will contribute to understanding how educational strategies can enhance patient engagement, increase openness to different treatment options, and improve outcomes. Findings from this research could provide insight for headache specialists in developing more efficient and patient-centered care that leads to more successful outcomes for patients and improves overall satisfaction.

IACUC None, the survey is anonymous and we won't be using medical records to identify patients.
Funding: None

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Metastatic Papillary Thyroid Carcinoma

Introduction
Thyroid cancer is the most prevalent malignancy of the head and neck and endocrine systems, characterized by a favorable prognosis. Distant metastases in papillary thyroid carcinoma (PTC) occur in fewer than 10% of patients, typically affecting the lungs and bones.
Case Presentation
We report a case of a 62-year-old woman with a history of papillary thyroid cancer who underwent total thyroidectomy in 2009. Pathology revealed a 0.8 cm tumor consistent with papillary microcarcinoma in the right lobe, with no high-risk features leading to a staging of pT1 NX MX. Postoperatively, she was started on levothyroxine and did not receive radioactive ablation therapy, follow-up ultrasounds showing no residual thyroid tissue.
Clinical Course
Between 2010 and 2023, she had elevated thyroglobulin levels, with unremarkable ultrasounds.
An iodine whole-body scan on November 30, 2023, demonstrated significant radiotracer uptake in the thyroid bed.
On December 19, 2023, the patient presented with worsening cough and hemoptysis. A CT chest scan revealed an endobronchial mass in the right lower lobe and bilateral lung nodules suggestive of metastatic disease. Bronchoscopy on December 21 confirmed metastatic carcinoma, with immunohistochemical staining indicating positive results for TTF-1, PAX-8, CK7, and thyroglobulin, supporting the diagnosis of metastatic thyroid carcinoma.
Conclusion
This case highlights that while papillary thyroid carcinoma generally has a good prognosis, although patient did not meet criteria for RAI ablation, still, distant metastases to the lungs can occur and worsen long-term outcomes. Follow up and monitoring of thyroglobulin levels are crucial in managing patients with a history of PTC.

Case report not required IRB approval
Funding: None

Baldwin A[1], Compton M[1], Feigel J[1], Sarret A[1], Turner S[1], Capino A[2], and Kimble A[2].
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Building Better Bones With Alendronate

Objective: To provide contemporary clinical information on Alendronate (Fosamax®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Alendronate (Fosamax®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

IRB Educational poster
Funding: None

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Long-term Effects of Prenatal Opioid Exposure on Astrocyte Glutamate Signaling

Prenatal opioid exposure (POE) remains a significant health crisis in the U.S., with incomplete understanding of the harmful neurodevelopmental and cognitive effects observed postnatally. Astrocytes, non-neuronal glial cells, have gained attention for their role in developmental regulation of CNS synapses due to their positioning in the neuropil, expression of surface proteins, receptors, and transporters, and signaling molecule interactions.

Further characterization of aberrant changes in these properties in POE models will enhance our understanding of developmental abnormalities in both animals and humans. This research focuses on two primary glutamate transporters, excitatory amino acid transporter 1 (EAAT1/GLAST) and excitatory amino acid transporter 2 (EAAT2/GLT-1), which are crucial for synaptic clearance of the excitatory neurotransmitter glutamate and preventing excitotoxicity. Using stimulated emission depletion (STED)-optimized fluorescence immunohistochemistry (IHC) in a mouse model of POE, we examined the effects of the opioid buprenorphine on EAAT1 and EAAT2 expression on astrocyte membranes in the primary somatosensory cortex. Our findings show that adolescent POE-model mice displayed significantly increased EAAT1 localization at astrocyte membranes compared to controls. Interestingly, EAAT2 expression was reduced at astrocytic membranes, but this was observed only in male mice. The observed alterations could indicate dysregulated glutamate signaling due to prenatal exposure or postnatal withdrawal, potentially contributing to synaptic dysfunction. These results highlight the importance of continuing to investigate POE's long-term effects on excitatory synaptic function, as such research could pave the way for developing new therapeutic interventions.

IACUC 697
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Heart's Best Bet or Bleeding Threat?

Objective: To provide contemporary clinical information on Prasugrel (Effient®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Prasugrel (Effient®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

IACUC Educational Poster
Funding: NA

Blevins M[1], Burns A[1], Cousins T[1], Marcum H[1], Spoor K[1], Capino A[2], and Kimble A[2].
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Clopidogrel: The Cardiac Defender

Objective: To provide contemporary clinical information on Clopidogrel (Plavix®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Clopidogrel (Plavix®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

IACUC Educational Poster
Funding: N/A

Greenhill S[1], James C[1], Sexton JR[1], Vogul D[1], Capino A[2], and Kimble A[2].

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Heart Health Made Simple: The Atorvastatin Solution

Objective: To provide contemporary clinical information on Atorvastatin (Lipitor®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Atorvastatin (Lipitor®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

Educational Poster
Funding: NA

Martini M[1], Richter CP[2].
[1]Medical Student, Joan C. Edwards School of Medicine; [2]Department of Otolaryngology, Northwestern University Feinberg School of Medicine

Evaluating the Viability of Photobiomodulation Therapy (PBMT) for Noise-Induced Hearing Loss: A Comprehensive Review

Noise-induced hearing loss (NIHL) is a prevalent form of sensorineural hearing damage, often resulting in irreversible cochlear hair cell loss. Photobiomodulation therapy (PBMT), involving low-level laser or light-emitting diode (LED) therapy, has emerged as a potential treatment to protect or regenerate these hair cells. In this study, we critically evaluate the effects of PBMT on cochlear hair cell protection and regeneration in guinea pig models. Previous research by Tamura et al. (2016) demonstrated that PBMT can activate nuclear factor κB (NF-κB) pathways, a key regulator of cellular stress responses, reducing cochlear damage in noise-exposed animal models. Additionally, Chen et al. (2009) found that PBMT mitigates oxidative stress through enhanced mitochondrial function and reactive oxygen species (ROS) modulation, promoting cellular survival and energy production. Despite these promising findings, significant inconsistencies persist in PBMT research due to variations in experimental parameters such as light wavelength, intensity, and treatment duration, which limit reproducibility and cross-study comparisons (Tuner, 2013). Our study aims to address these inconsistencies by employing a rigorously controlled PBMT protocol in guinea pigs, focusing on standardizing key parameters to enhance the reliability of the outcomes. Preliminary findings suggest PBMT's potential to reduce cochlear hair cell loss following noise exposure, though the long-term protective effects remain uncertain. The lack of large-scale, standardized preclinical trials continues to hinder the translation of these findings to clinical practice. Future research must emphasize consistency in methodology and investigate the underlying cellular mechanisms in greater depth to validate PBMT as a viable therapeutic approach for NIHL.

IACUC N/A
Funding: American Hearing Research Foundation

Baker B[1], Dague A[1], Kirk K[1], Podrasky M[1], Riffe S[1], Capino A[2], and Kimble A[2].
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Risedronate: Breaking Up with Osteoporosis

Objective: To provide contemporary clinical information on Risedronate (Actonel®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Risedronate (Actonel®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

Educational Poster

Funding: NA

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Understanding Patient Outcomes and Predictors for Spinal Cord Stimulator Success in Chronic Pain Management

Spinal cord stimulators (SCS) are used to treat various chronic pain syndromes. Common indications for implantation of SCS include failed back surgery syndrome, complex regional pain syndrome, chronic head and neck pain, neuropathy, medically refractory angina, peripheral vascular disease, and post-thoracotomy pain syndrome. There are many advantages of SCS in the treatment of chronic pain, especially in conditions that did not respond to other surgical or pharmacologic therapies. Proper selection of patients and implant is crucial to achieve the best results.Over the last few years there have been many studies showing superior outcomes of SCS compared to best medical management or traditional paresthesia based tonic stimulation but little is known which patients respond best to SCS and which waveforms perform best for which patients..
The purpose of this project is to identify factors that lead to successful SCS outcomes including demographics, comorbidities, pain type, duration, location of pain, medications, pain reduction at trial, waveform, and follow up programming visits. The study also assesses the comfortability and willingness to undergo the procedure again to help inform patients needing to undergo SCS.
Data was collected via chart review and surveys on 42 patients who underwent primary SCS placement for various pain syndromes. Our responder rate (>50% reduction in pain) was 95% at time of trial but at time of phone survey the responder rate dropped to 58% highlighting that trial alone is not a good predictor of outcome. However, 75% of patients were happy with the results and would undergo the procedure again. Statistical analysis to determine any significance of demographics, comorbidities, pain type, duration, location of pain, medications, waveforms, and follow up programming visits in our cohort of patients is still pending.

IRB 2173547
Funding: NA

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Screening monocarbonyl curcumin analogues for their anticancer effects

Curcumin, (1E,6E)-1,7-bis (4-hydroxy-3-methoxyphenyl) hepta-1,6-diene-3,5-dione, is the major bioactive compound present in Curcuma longa which has been extensively studied for its anticancer effects both preclinically and clinically. However, it failed in clinical trials due to low bioavailability as a result of poor absorption and rapid biotransformation. To circumvent the bioavailability problem, hundreds of analogs have been synthesized. In the present study, we investigated the anticancer effects of eleven monocarbonyl curcumin analogues against non-small cell lung cancer and head and neck cancer cell lines and compared the effect with curcumin and cisplatin. IC50 values were determined by SRB assay at 72h of treatment against H460 and H1299 cell lines. While most of the analogs were worse than curcumin, couple of them namely FLLL22/TEL102 and TEL109 exhibit strong anticancer effects with IC50 <1μM. The IC50 values of these analogs are comparable or better than that of cisplatin, the most commonly used chemotherapy drugs. We further extended our study with FLLL22 against a panel of cell lines including normal human oral keratinocytes (HOK). FLLL22 was found 23.2 to 36.0-folds more potent than curcumin, while HOK is comparably much less sensitive. FLLL-22 at 1μM dose completely inhibited the colony formation for H460 cells. We also studied time-and dose-dependent apoptosis by annexin V-PE staining and found that FLLL22 significantly induced apoptosis of H460, A549, H1299, and H1975 cells. In conclusion, FLLL-22 is a highly potent curcumin analog that warrants further in-vitro mechanistic and in-vivo efficacy studies.

IACUC Not Applicable
Funding: Grant: R15DE032063 and P20GM103434

Abdul-Khoudoud O[1], Al Anbari A[1], Campbell K[1], Covington C[1], Snyder C[1], Capino A[2], and Kimble A[2].
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Fexofenadine: Say Goodbye Allergies, Hello Allegra
Objective: To provide contemporary clinical information on Fexofenadine (Allegra®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Fexofenadine (Allegra®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other

medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

Educational Poster
Funding: NA

Shore D[1], Evans D[2], Custodio M[2], Taylor E[2].
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Comparing the outcomes of adults with urinary tract infections treated with single-dose aminoglycosides versus standard of care in a single-center cohort

Introduction: Urinary tract infections (UTI) are one of the most common reasons for patients to present to healthcare facilities and are currently the fifth most common infection acquired incidental to healthcare treatment. The ideal antimicrobial treatment for these infections are medications that have high concentrations in the bladder and adequate coverage for the more common pathogens (E. Coli, Klebsiella, Proteus). Historically, standard of care has been treatment with either a cephalosporin or fluoroquinolone with a treatment duration ranging between 3 and 7 days. These more broad spectrums agents put the patient at more severe infection risk and resistance mechanisms. In previous studies, single dose gentamicin has been shown to be effective as monotherapy for UTIs due to its ability to concentrate in the urine and achieve minimum inhibitory concentrations (MIC) necessary to treat these organisms for multiple days post-administration.
Methods: In this retrospective, single-center propensity-score matched cohort study, we compare treatment efficacy between single dose aminoglycosides and standard of care with secondary outcomes including; incidence of acute kidney injury (AKI), clostridioides difficile infection within 30 days of therapy completion, 30 day recurrence of UTI, length of stay, and MDRO within 90 days of treatment.
Results & Conclusions: To be presented at the Joan C. Edwards School of Medicine Health Sciences Research Day 2024.

IACUC 1914997-4
Funding: N/A

Atkins K[1], Burton R[1], Nelson A[1], Schultz Z[1], Capino A[2], and Kimble A[2].
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Zyrtec- Zyrtick the allergies away

Objective: To provide contemporary clinical information on Cetirizine (Zyrtec®) for other healthcare providers and patients.
Methods: Micromedex and Lexidrug were used to provide relevant information for the use of Cetirizine (Zyrtec®) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

Educational Poster
N/A

Lintz C[1], Lykins M[1], Lysandrou Z[1], McNab G[1], Capino A[2], and Kimble A[2].
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Crestor: The Cholesterol Crusher

Objective: To provide contemporary clinical information on Generic Name (Trade Name®) for other healthcare providers and patients.
Methods: Lexicomp and Micromedex were used to provide relevant information for the use of Generic Name (Trade Name) for three specific contemporary clinical indications
Results and Discussion: Information will be provided on the mechanism of action, the availability as a prescription or over-the-counter product, three most common and three most serious adverse effects, and any Black Box Warnings or REMS. Additional information will focus on the available dosage

forms, how this medication is best taken, dosage for the three specific clinical uses, dosage adjustments if relevant for geriatric and/or pediatric patients, and any relevant dosage adjustments for renal and/or hepatic dysfunction if appropriate. Important medication interactions, specifically other medications that should not be taken in combination or will require a dosage reduction with this specific medication will also be highlighted. Adult patient education including pharmacists counseling and other aspects that the patient should monitor as needed with their healthcare provided will be presented. Finally, this presentation will feature any interesting items for the specific medication to share with other healthcare providers.

Educational Poster
Funding: NA

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Medical Neglect in a Child with Cystic Fibrosis

Parents hold the responsibility for making medical decisions on behalf of their children, traditionally following the best interest standard. It has been suggested that parents are granted wide discretion in decision-making, as long as the child's basic needs and well-being are protected. This holds true even if the chosen option does not offer maximum benefit but is considered a 'good-enough' choice. Medical providers are often faced with the role of intervening if there is risk for harm in the child. This case study explores the ethical complexities surrounding the medical care of a 13-year-old girl with cystic fibrosis (CF), who has lacked appropriate medical treatment for eight years. Cystic fibrosis now has treatments that alter its clinical course, significantly improving both morbidity and mortality. She presents in critical condition, requiring invasive mechanical ventilation, with a lung transplant being her only viable option for long term survival. Child protective services have intervened, terminating her parents' rights to make medical decisions and pursuing criminal charges, which could result in up to five years of imprisonment. Despite the perception of a loving home, the case underscores significant medical neglect. It raises important questions about the threshold for defining parental decisions as neglect and challenges the defense of ignorance regarding a child's medical condition. This case emphasizes key ethical considerations, including parental responsibility, constrained parental autonomy, and the standard of care, while advocating for the patient's best interests as paramount.

IRB None required case study
Funding: None required

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The Relationship between Time Spent on Social Media and Anxiety and Depression in Adolescents

According to the Center for Disease Control and Prevention (CDC), among children aged 3-17 years in 2016-2019, approximately 5.8 million suffered from anxiety and 2.7 million suffered from depression in the United States. Researchers have investigated if there is a correlation between social media use and these statistics. Reihm et al. (2019) looked at time intervals spent on social media and proposed adolescents that spent more than 3 hours per day were at heightened potential risk for mental health problems. Another study looked at multiple social media platforms and their effects on depression using the Patient Health Questionnaire (PHQ)(Perlis et al., 2021). Some research has been inconclusive in determining whether social media has been harmful or beneficial for individuals (Steinsbeckk et al. 2023) (Tosum & Kasdarma, 2020), whereas others suggested that social media exposure led to fear, anxiety, and depression (Gu et al.,2023). The present study provided a more detailed understanding of the effects of social media usage by integrating aspects from previous research: standardized quantitative measurements for both depression and anxiety, fixed time intervals, and assessing different social media platforms. By combining all these variables, the present study provided more information to help guide parents in making informed decisions regarding social media exposure for their children.

IRB N/A
Funding: N/A

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Title: A Case of Non-Classic Wolfram Syndrome Type 1

Introduction:
Monogenic diabetes is a heterogeneous disorder characterized by diabetes diagnosed at a young age, with autosomal dominant inheritance and a lack of autoantibodies. We present the case of a middle-aged male with longstanding, poorly controlled diabetes, who was ultimately diagnosed with a rare genetic condition.

Case Description:
A 51-year-old male presented to the endocrinology clinic for evaluation of diabetes mellitus. He was diagnosed at age 38. His BMI was 25, and had no history of diabetic ketoacidosis. His HbA1c levels had ranged from 9.5% to 12.3% since diagnosis. His past medical history was significant for depression. His family history included a sister with diabetes. He had tried several oral hypoglycemic agents, as well as insulin, with no improvement in glucose control. A comprehensive workup revealed a normal C-peptide level and negative islet autoantibodies. A genetic panel for monogenic diabetes revealed a heterozygous WFS1 variant, c.505G>A (p.Glu169Lys), leading to a diagnosis of Non-classic Wolfram syndrome type 1 (WFS1).
Non-classic WFS1 spectrum disorder (WFS1-SD) is a rare form of monogenic diabetes caused by heterozygous pathogenic variants. It is characterized by defective insulin secretion, and ultimately beta cell loss. In addition to diabetes, patients may present with sensorineural hearing loss, optic atrophy, and neurodegenerative diseases.
Conclusion:
The classification and diagnosis of diabetes have evolved over the years, and access to genetic testing allows us to tailor treatment and identify affected family members. This case highlights the importance of a comprehensive evaluation, including genetic testing in every young patient with challenging glucose control.

IRB not needed case study
Funding: none

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Evaluating the Accessibility of GLP-1RA and GIP Medications in Rural Counties of Kentucky, Southeast Ohio, and West Virginia

Access to glucagon-like peptide-1 receptor agonists (GLP-1RAs) and glucose-dependent insulinotropic polypeptide (GIP) medications is critical for managing type 2 diabetes and obesity. However, individuals in rural communities often encounter obstacles in obtaining these therapies, resulting in poorer health outcomes. This study aimed to assess the availability of GLP-1RA and GIP medications in rural counties across Kentucky, Southeast Ohio, and West Virginia. To capture patient perspectives and identify barriers—such as high costs, medication shortages, and limited pharmacy options—a survey was distributed through local pharmacies and shared on social media. Preliminary results indicate that these barriers significantly impact patient care in these areas. By highlighting these challenges, this research offers valuable insights for healthcare providers and policymakers to enhance medication access and improve health outcomes in underserved rural populations

IRB NONE REQUIRED
Funding: N/A; funding was not needed

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A case of Catecholamine secreting tumor Presenting with Stroke

Introduction:
Adrenal nodules are often detected incidentally, and the majority are not hormonally active. Pheochromocytomas are catecholamine-secreting tumors with distinctive imaging features. Occasionally, they are discovered during the diagnostic workup of resistant hypertension, and very rarely do they present with the classic symptoms of headaches, palpitations, and sweating. We present a case of hypertensive emergency leading to intracerebral hemorrhage in a patient with a catecholamine-secreting tumor.
Case Description:
A previously healthy 58-year-old Caucasian male was brought to the emergency department after becoming unresponsive at home. His past medical history was significant for hypertension, and his only home medication was lisinopril. On arrival, his blood pressure was 200/120 mmHg, and his heart rate was 130 beats per minute. MRI of the brain showed an extensive posterior circulation infarct and identified a left vertebral artery thrombus.
A CT scan of the abdomen showed a 7.7 × 7.2 cm peripherally calcified left adrenal mass. The patient was started on doxazosin, and later metoprolol was added until blood pressure was controlled. Serum metanephrines were elevated at 756.6 pg/ml (normal range: 0–244 pg/ml), confirming the diagnosis of pheochromocytoma. Despite medical intervention, his neurological status continued to decline, and the patient died a few days later.
Conclusion:
Cerebrovascular embolic stroke in patients with catecholamine-secreting tumors is extremely rare. Pheochromocytomas create a hyperadrenergic state, leading to vasoconstriction of the cerebral vasculature, which can precipitate stasis and thrombosis. This case highlights the importance of investigating secondary causes in hypertensive emergencies, especially in previously healthy adults.

IACUC None Required
Funding: none

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Bilateral Thalamic Hyperintensities in Uncommon Presentations of Anti-NMDA Receptor Encephalitis

Background:
Anti-N-methyl-d-aspartate (NMDA) receptor encephalitis is a form of autoimmune encephalitis that presents with severe psychiatric and neurological symptoms that make it difficult to diagnose. It most commonly presents in young women. Diagnosis is made with serum or CSF screening for antibodies to the NMDA receptor subunit. Brain MRI is often obtained during work up but has been reported as normal in up to 70% of cases.
Case presentations:
We report two cases of Anti-NMDA encephalitis presenting in older women with uncommon presentations.
The first patient was a 59-year-old female who initially presented with polydipsia, resulting in hyponatremia that was subsequently rapidly over-corrected. Her mental status and neurologic exam continued to worsen despite treatment. MRI Brain showed bilateral thalamic hyperintensities. Diagnosis of Anti-NMDA encephalitis was made with CSF studies.
The second patient was a 66-year-old female who presented with new onset seizure. She was initially diagnosed with posterior reversible encephalopathy syndrome (PRES) based on her Brain MRI and uncontrolled blood pressure. As findings of PRES improved, hyperintensities in the thalami and basal ganglia did not improve. Diagnosis of Anti-NMDA encephalitis was later made with CSF studies.
Conclusion:
Anti-NMDA receptor encephalitis can be difficult to diagnose based on initial symptoms and even with thorough work up. To the best of our knowledge, it is rarely described to have these Brain MRI changes in the setting of Anti-NMDA receptor encephalitis. Our cases do appear to correlate with previous literature indicating that these findings may represent more severe or atypical disease course.

IRB None required Case Presentation
Funding: None

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The Trend Of Hospitalization Outcomes For Patients With Ulcerative Colitis In The United States: Eight Year Analysis For The National Inpatient Sample

Introduction
In recent years, ulcerative colitis (UC) management advancements have included new biological medications, increasing therapeutic options, and educational initiatives. Despite progress, the impact of these changes on hospitalized UC patient outcomes remains uncertain. This study seeks to elucidate trends and effects on UC patient hospitalization outcomes in light of evolving management strategies.
Methods
Utilizing the national inpatient sample (2011-2018), UC patients were identified, including comorbidities and if colonoscopy or surgical intervention was performed. Outcomes examined using survey methods included mortality rates, length of stay, hospital charges, inpatient colonoscopy frequency and timing, and IBD-related surgery occurrence. Comparative assessments were then conducted using a 2011 reference point to identify patient outcome trends through 2018.
Results
This study utilized a weighted sample of 497,844 eligible patients, ranging from 59,665 to 64,909 patients annually, representing 0.17% to 0.19% of total yearly admissions. Analyzing outcomes revealed a statistically significant decline in mortality odds from 2014 onward. Furthermore, reductions were seen in length of stay and inpatient colonoscopy odds, while hospital charges increased. No significant variations were seen in colonoscopy timing or probability within 48 hours of admission or IBD-related surgeries.
Discussion and Conclusion
Overall, this study sheds light on notable trends in UC patient hospitalization outcomes. While hospitalization rate overall did not change, mortality decline suggests patient care advancements. Additionally, increasing hospital charges highlights nuances in management. Furthermore, decreased inpatient colonoscopy odds indicates shifting diagnostic approaches. While some outcomes were unchanged, the findings provide valuable insight into the evolution of UC patient outcomes.

This project used the National Inpatient Sample, which is an unidentified, publicly available data from the Healthcare Cost and Utilization Project, and it is exempt from any IRB approval.
Funding: This is an investigator-initiated project with no funding to disclose.

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Low Dose HSP90 Inhibition Using AUY922 to Limit Epithelial to Mesenchymal Transitions and Metastatic and Drug Resistance Acquisition of Non-Small Cell Lung Cancer

Objectives: Treatment failure in cancer is often due to multiple drug resistance (MDR) and metastasis. Heat shock protein 90 (HSP90) is significantly upregulated in cancer cells and has been implicated in both MDR and epithelial-to-mesenchymal transition (EMT). Previous research demonstrated a negative correlation between HSP90 inhibition and EMT/MDR acquisition in the A549 non-small cell lung cancer (NSCLC) line. This study aims to continue this research by evaluating whether HSP90 inhibition using AUY922 reduces EMT and MDR in two NSCLC cell lines, A549 and H1299.

Methods: We investigated the effects of low-dose AUY922 on EMT and MDR in NSCLC using flow cytometry to assess cell surface markers. EMT was induced with TGF-β, and paclitaxel (PTX) was used to simulate drug resistance for MDR analysis. E-cadherin expression, an indicator of EMT, was measured in treated and untreated cells. MDR was assessed by quantifying ATP-binding cassette (ABC) transporter expression, including CD243 (P-gp) and CD338 (ABCG2).

Results: AUY922 treatment led to an increase in E-cadherin expression, indicating inhibition of EMT. Furthermore, a notable decrease in ABC transporter expression suggested reduced MDR acquisition. These effects were observed consistently in both A549 and H1299 cell lines.

Conclusion: Low-dose HSP90 inhibition by AUY922 effectively limits both EMT and MDR in NSCLC, potentially enhancing the efficacy of chemotherapeutic agents like paclitaxel. This study extends prior research on A549 cells, demonstrating similar trends in another NSCLC line, H1299, and supports HSP90 as a promising therapeutic target to overcome metastasis and drug resistance in NSCLC.

IACUC N/A. This research is done specifically using approved cell lines of NSCLC's and is not required to get approval through the IRB.

Funding: None indicated

Najam B, Alagha Z, Jumani M, Thapa S, Hackett J, Sangani D, Mattar R, and Ashraf E.
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Impact of Prior Statin Use on outcome in sepsis

Introduction:
Sepsis, a life-threatening response to infection, is one of the leading causes of death in hospitals, with patients often deteriorating rapidly within the first 48 hours. Despite significant advances in sepsis management, there remains a critical gap in identifying therapies that specifically target the underlying inflammatory pathways to reduce early mortality. Statins, traditionally used for cholesterol management, have been suggested to possess potent anti-inflammatory properties that could potentially benefit septic patients. The aim of this study is to evaluate whether prior statin use improves 48-hour survival in patients hospitalized with sepsis compared to those not on statins.
Methods:
This prospective observational case-cohort study analyzes clinical data from adult septic patients and compares outcomes between those on statin therapy and those not receiving statins. If effective, this widely available medication could offer a novel, cost-effective approach to reducing mortality in one of the most challenging and lethal conditions in critical care.
Implications of the study:
Prior statin use in septic patients could offer a protective effect by modulating the inflammatory response, making it a promising area for future research to explore its role as an adjunctive therapy in sepsis management. Future large-scale randomized controlled trials could confirm the potential benefits of statins in sepsis, identify the ideal dosing regimens, and pinpoint patient subgroups most likely to benefit. This would pave the way for integrating statins into sepsis management protocols and refining treatment strategies to improve patient outcomes.

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Funding: None

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Obstructive Sleep Apnea and Lung Cancer Among Patients in Appalachia: A Retrospective Cohort Study

Obstructive sleep apnea (OSA) is a common sleep disorder linked to cardiovascular and metabolic diseases, but its relationship with lung cancer remains unclear. It is known that WV has one of the highest incidence rates of lung cancer nationally (82.8 per 100,000) and an expected OSA prevalence of 25%. This study aims to investigate the prevalence of OSA among newly diagnosed lung cancer patients in Appalachia and compare their outcomes to patients without OSA. We will examine whether OSA correlates with specific lung cancer subtypes and assess the temporal relationship and survival outcomes between OSA and lung cancer diagnoses.
A retrospective chart review of patients aged 50 or older diagnosed with lung cancer between 2019 and 2024 will be conducted across multiple Appalachian healthcare centers. Patients with multiple cancers or incomplete records will be excluded. Data will include demographics, comorbidities, smoking history, OSA diagnosis and severity, lung cancer subtype, stage, and survival time.
Statistical analyses will determine the prevalence of OSA, compare lung cancer subtypes by OSA status, and evaluate survival using Kaplan-Meier curves and Cox proportional hazards models. Logistic regression will assess the odds of OSA among lung cancer patients, adjusting for confounders like age, smoking history, obesity and other comorbidities. A sample size of 400 patients (200 per group) will provide adequate power to detect significant differences.
This study aims to clarify the association between OSA and lung cancer, providing critical insights into whether OSA impacts lung cancer risk, progression, or survival in this high-risk population.

IRB 2218825-1
Funding: None

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Unmasking Severe Hypertriglyceridemia Without Pancreatitis: A Case Report

Introduction:
Severe hypertriglyceridemia (HTG), defined as triglyceride levels exceeding 1000 mg/dL, is a known risk factor for acute pancreatitis, occurring in about 7% of cases. However, the absence of pancreatitis in such presentations is rare, warranting further analysis to understand its management and implications. Without pancreatitis, severe HTG still poses risks for cardiovascular disease, hepatic steatosis, and other complications, revealing a research gap in its pathophysiology and risk stratification.
Case Presentation:
A 21-year-old African-American female with type 1 diabetes, hyperlipidemia, and recurrent pancreatitis presented with severe epigastric pain. Despite critical hypertriglyceridemia (>2500 mg/dL) and elevated blood sugars, imaging showed hepatomegaly without signs of pancreatitis. Due to medication access issues, she was treated with an insulin drip and NPO status to lower triglyceride levels. The absence of expected complications suggests potential protective genetic or metabolic factors, emphasizing the need for individualized management and refined guidelines.
Discussion:
This case highlights a patient with extreme HTG but no pancreatitis, underscoring the variability in clinical presentations. Managing such cases is complex and requires rapid triglyceride reduction. Understanding protective mechanisms could guide personalized therapeutic approaches and risk stratification, especially in young patients with type 1 diabetes.
Conclusion:
Early intervention, regular monitoring, and guideline refinement are essential for preventing complications and optimizing outcomes in severe HTG without pancreatitis.

IRB none case study
Funding: none

Soucier C[1], Suresh A[1], Peterson J[1], Groves J[1], Wooten B[1], Cobbs J[1], Coulson A[2], Lavender C[3], and Hewett T[3].
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Functional Recovery Progress in Anterior Cruciate Ligament Reconstruction with Biologics and Suture Tape Augmentation

ACL reconstruction (ACLR) aims for restoration of knee function and stability. The present study evaluated the effectiveness of an innovative ACLR approach with biologic and suture tape augmentation with internal bracing, bone marrow aspirate, and demineralized bone matrix.
Effectiveness was evaluated by measurement of patient performance through exercises conducted six months after surgery. Metrics were obtained with movement analysis technology. Performance categories included Movement Score, Symmetry and Balance, Limb Symmetry Index (LSI), Athletic Movement Index (AMI) Rating, and functional assessments such as Side Plank, Single Leg Squat, Single Leg Hop, and Ankle Lunge, all measured bilaterally. The mean results from thirty-one patients, X males and X females, were used to evaluate overall functional recovery.

At 6 months post-ACLR, patients showed an average Movement Score of 61.1%, Symmetry and Balance of 80.6%, and AMI Rating of 46.0%. The LSI averaged 80.5%. Functional performance in the Side Plank was 73.3% (left) and 78.6% (right). Single Leg Squat averaged 80.6% (left) and 78.5% (right), while Single Leg Hop showed 77.7% (left) and 68.2% (right). Single Leg Hop Plant averaged 84.3% (left) and 84.8% (right). Ankle Lunge assessments showed strong recovery with 87.5% (left) and 90.8% (right).
Patients who underwent this innovative ACLR technique demonstrated a favorable recovery profile at 6 months. Results showed notable recovery in balance, limb symmetry, and functional performance across key metrics including strength, stability, and range of motion bilaterally. These findings show the potential functional benefits of this surgical innovation for enhancement of post-ACLR recovery.

IACUC 1932409-3
Funding: Arthrex and Marshall Orthopaedics

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Microbiota contribution to diabesity and Salmonella colonization in male TALLYHO mice

Metabolic disorders, including obesity and diabetes, are widespread in Westernized nations and fueled by daily consumption of a high-fat diet. The combined adverse health effect of diabetes and obesity is known as diabesity. Type 2 diabetes (T2D) is an independent risk factor for focal extraintestinal infections caused by non-typhoidal Salmonella. The underlying mechanism of this predisposition is not clearly understood. To evaluate the contribution of diabesity to Salmonella colonization, we investigated diabesity-induced changes in the gut microbiota in TALLYHO (TH) mice, a polygenic model of T2D. Eight-week-old male TH mice were placed on chow diet or high-fat diet (HFD) (45 kcal% fat) for 8 weeks to promote diabesity. As expected, mice on HFD had accelerated weight gain and most developed hyperglycemia by 16 weeks of age. Meanwhile, most mice on chow diet remained normoglycemic and normal weight. At 16 weeks mice from both diet groups were either infected orally with 106 CFU (colony forming units) of fully virulent Salmonella enterica serotype Typhimurium or remained uninfected. Mice were euthanized after becoming symptomatic. Cecal contents were used for DNA isolation and shotgun sequencing. The taxonomic profile showed dramatic changes in the gut microbiota of mice on HFD compared to those on chow diet. Mice on HFD had lower abundance of Salmonella in the gut and a higher incidence of extraintestinal spread and enteric opportunistic pathogens than chow mice. Our results suggest that diet and glucose level have a synergistic and confounding effect in regard to Salmonella abundance in the gut.

IACUC #: 753
Funding: WV-INBRE Chronic Disease Research Program (NIH P20GM103434)

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Determining the Efficiency of Preventing Multidrug-Resistance Through HSP90 Inhibition

Currently, multidrug resistance (MDR) is one of the most common failings of chemotherapy treatment. One mechanism that can produce MDR is the increase of transport proteins on the surface of the cancer cell associated with the efflux of the anti-cancer drug. This expression results in the ability to pump out toxins allowing the cancer to evade the treatment and continue to progress, decreasing the rates of long-term remission among patients and increasing the severity of treatment regimes. Heat Shock Protein 90 (HSP90) is a conductor of phenotypic change. HSP90 is a highly conserved chaperone protein that serves several client proteins, interacts with HDAC3, and is a proponent of epigenetic change within cells. Previous studies focusing on the treatment of cancer cells with AUY-922, a HSP90 inhibitor, have shown inhibition decreased the cells' ability to undergo MDR associated phenotypic changes. In other studies, HSP90 had been implicated in changes regarding histone acetylation. With these key ideas in mind, it is our hypothesis that MDR associated phenotypic changes are impeded by transient inhibition of HSP90 through epigenetic mechanisms involving histone acetylation. To test the first part of this idea, we completed assays examining how HSP90 inhibition affects cancer cells that have been introduced to a MDR inducer (Paclitaxel). The results of the assays were mixed, with some cell types showing down-regulation of transport proteins of interest, while others did not.

IACUC N/A
Funding: P20GM103434 from NIH, Undergraduate Creative Discovery Award

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Nivolumab-Induced Lymphocytic Colitis in a Patient with Concurrent SSRI, NSAID, and PPI Therapy: A Case Report

Case Presentation
We present a 50-year-old female with a past medical history significant for anxiety, depression, chronic constipation and GERD and a recent diagnosis of head and neck Stage IIIc melanoma with positive adenopathies. The patient was on SSRI, NSAID, and PPI when was started on Nivolumab for immunotherapy. Before the therapy, she had a history of long-standing constipation. A few weeks after initiating the therapy, she started having 5/6 nonbloody, non-mucinous diarrheal bowel movements daily without any associated abdominal pain and no significant improvement on loperamide. KUB ruled out overflow diarrhea. Given the onset of symptoms and current medication, immune checkpoint colitis was high on our differential diagnosis. CBC, CMP, CRP, ESR, celiac serology, fecal calprotectin, fecal-ova and parasite showed no abnormalities. Colonoscopy didn't show any macroscopic lesions, but biopsies were consistent with lymphocytic colitis.
The patient was started on budesonide 9 mg daily with resolution of her symptoms within 3 months. Note that nivolumab was briefly discontinued and restarted following improvement of symptoms on budesonide.
Discussion
Our patient was at risk of lymphocytic colitis due to the concurrent use of PPI, SRRI, and NSAID. It is important to note that patients starting nivolumab are at higher risk of developing immune checkpoint inhibitor-induced colitis but in this specific case the biopsy showed lymphocytic colitis.

IRB N/A Case Study
Funding: N/A

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Evaluating Antibacterial Efficacy of Minimal vs. Extensive Preoperative Eyelid Scrubbing with Betadine

Purpose: To assess whether a minimal scrub with topical betadine is as effective in reducing bacterial presence as a more extensive scrub of the lashes and lids with betadine before intraocular surgery.
Background: Preoperative sterilization of the eyelids is standard practice to prevent postoperative infections in ophthalmic surgery. The extent of scrubbing varies among facilities, ranging from minimal to extensive scrubbing of the lashes and lids with betadine. Determining if extensive scrubbing offers no additional antibacterial benefits could improve operating room efficiency and reduce preoperative time and costs.
Methods: Patients scheduled for eye surgery were randomized into two groups: Group 1 received topical betadine and a minimal eyelid scrub lasting less than 30 seconds, and Group 2 underwent a more extensive scrub of the lashes, lids and the surrounding skin with betadine, lasting up to one minute. After preparation, conjunctival cultures were obtained to measure bacterial presence by counting colony-forming units (CFUs). The CFU counts between the two groups were compared to assess antibacterial efficacy.
Results: Preliminary analysis shows no significant difference in CFU counts between the minimal scrub group and the extensive scrub group, supporting our hypothesis. Statistical evaluation is ongoing to confirm these findings. Adoption of minimal scrub protocols could enhance operating room efficiency and reduce preoperative time and costs. This study aims to inform best practices in ophthalmic surgery and contribute to the optimization of surgical protocols.

IRB 2071901-3
Funding: Marshall Eye Surgeons

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Empathy Evaluation in AI Language Models: A Comparative Analysis Using EQ and TEQ Scales

Artificial intelligence (AI) is rapidly evolving, with most notable recent advancements in generative natural language models. Natural language models in particular have the potential to serve as conversational therapy tools in psychiatric care. However, the empathetic qualities of these models must be evaluated to assess their suitability to this tooling. Recent studies have shown that ChatGPT produces empathetic responses and scores higher on different empathy scales compared to people with Autism. To further evaluate cognitive and affective aspects of empathy in AI models, this study applies standard Empathy Quotient (EQ) and Toronto Empathy Questionnaire (TEQ) scales– psychological frameworks designed to evaluate empathy – and compared the results four major AI models on these scales: Gemini-1.5, GPT4o-mini, Llama-3.1 70b, and Grok-2 mini. Using the EQ scale, we found that GPT4o-mini outperformed all other models ($p < 0.01$) with no other significant differences identified. Using the TES, we found that Llama-3.1 outperformed the rest of the model ($p < 0.01$). All the models scored bimodally on the TES with a cluster of high scores and a cluster of low scores. This study demonstrates that AI models produce high scores on standard empathy scales, with some models performing better than others. However,

implicit AI limitations such as biased training as well as oversimplifications of empathy in EQ and TEQ scoring systems complicate the interpretation and applicability of our findings to AI tooling in psychiatry. Future studies may explore hybrid approaches that combine AI with human insights to improve AI as a therapy tool in psychiatric care.

IRB none needed
Funding: None

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Efficacy and Safety of Greater Occipital Nerve Blocks in Migraine Treatment for Adolescents in a Rural Population

Introduction
Headaches are a common phenomenon. A study by Stovner, et al, (2022), found 16% of the general population have a headache at any given time . Another study by Abu-Arafeh, et al, (2010), concluded that within a 3-month period, 60% of the pediatric population will have headache symptoms, with 8% experiencing migraine. Greater occipital nerve blocks (GONB) have shown promise in reducing headache frequency and severity in adults. Whether this procedure is safe and efficacious in children and adolescents is unknown.
Objective
To assess the efficacy and safety of GONB in the treatment of headaches in a rural pediatric and adolescent population.
Methods
We reviewed the medical records of all patients under age 18 who received GONB at the Marshall Neurology Clinic in Huntington, WV between April 24, 2019, and June 25, 2024. Efficacy was assessed by changes in headache frequency per month. Adverse effects were also assessed.
Results
Information was available for 14 pediatric patients with a total of 36 procedures being performed. In eight patients (57%) headaches were reduced from daily to once or twice a month. Six patients (43%) reported no decrease in headache occurrence and continued to have daily headaches. One patient experienced temporary left-sided facial paralysis.
Conclusion
GONB appears to have reduced headache days in over half of 14 pediatric patients. Although the sample is small and limited to a rural WV population, this data indicates that nerve blocks may have a modest benefit in the frequency and severity of children and adolescents with migraine.

IRB 2233227-1
Funding: N/A

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A Case of Primary Cutaneous Diffuse Large B-Cell Lymphoma, Leg-Type: Diagnostic Challenges and the Critical Role of Early Intervention

Primary cutaneous B-cell lymphomas (PCBCL) make up 20-25% of cutaneous lymphomas and 2% of non-Hodgkin lymphomas. A subtype, primary cutaneous diffuse large B-cell lymphoma, leg-type (PCDLBCL-LT), accounts for 15% of PCBCLs and primarily affects elderly women, presenting as rapidly growing red-to-bluish nodules on the lower legs. While these cancers originate in the skin, they may spread to extracutaneous sites in 45% of cases. Diagnosis involves biopsy, immunohistochemistry, and staging, with histological findings of dense B-cell infiltrates expressing specific markers. Prognosis is poor, with a 5-year survival rate of 60-70% due to frequent relapses and extracutaneous spread. Treatment includes excision and radiotherapy for solitary lesions, and R-CHOP chemotherapy for multifocal cases, which improves 5-year survival by about 60%.
In this case, we present a 78-year-old male with no prior history of malignancy or autoimmune disease and onset of diffuse large B-cell lymphoma, leg-type. The patient presented with a three-month history of non-pruritic sores on the right leg, which did not respond to antibiotics, triamcinolone, zinc oxide, or Neosporin. Dermatological examination revealed multiple erythematous, firm, fixed nodules on his lower extremity. A biopsy indicated a diffuse lymphocytic infiltrate with CD20-positive B-cells, leading to a diagnosis of B-cell lymphoma. Prompt diagnosis was crucial as the PET scan revealed multiple hypermetabolic lymph nodes and potential malignancy in the nasal cavity, underscoring the importance of early intervention and prompt treatment.

IRB None needed case study
Funding: None

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Tattoo Ink Fluorescence Interfering with Axillary Reverse Mapping in Breast Conservation Surgery: A Case Report

Introduction: Breast cancer-related lymphedema (BCRL) is a significant postoperative complication of surgical breast cancer management, affecting approximately 1 in 5 women. Axillary reverse mapping (ARM) aims to reduce BCRL by differentiating lymphatic drainage paths in the arm versus the breast. Sentinel lymph node biopsy (SLNB) followed by fluorescent indocyanine green (ICG) for ARM has emerged as a promising alternative to traditional methods to reduce this complication.
Case Presentation: A 55-year-old postmenopausal woman presented to the breast oncology clinic after screening mammogram revealed a mass in the right breast. She was diagnosed with ER/PR positive, HER2 negative, Grade 1 Invasive Ductal Carcinoma (IDC) and underwent right breast lumpectomy with SLNB, using a radioactive tracer and ICG for lymphatic mapping. Green fluorescence was observed in axillary lymph nodes with pigment from previous tattoos, raising concerns about false-positive identification of sentinel lymph nodes.
Discussion: Tattoo ink-stained lymph nodes are indicated in the literature as interfering with SLNB, complicating intraoperative decision-making and potentially leading to over-excision or under-staging of cancer. This case highlights a unique interaction between ICG and tattoo ink, suggesting that lipid-bound ICG utilizes the hydrophobic suspension in black tattoo ink to bind and travel to the lymph node. We propose that this mechanism led to the false-positive node fluorescence in this patient.
Conclusion: Recognizing tattoo pigmentation's impact on lymphatic mapping during breast cancer surgery is crucial. Further exploration of the biochemical interactions between ICG and tattoo ink can refine surgical approaches and improve patient outcomes in the context of BCRL prevention.

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A Rare Case of Nicolau's Syndrome Following a Hyaluronic Acid Injection.

Introduction:
Embolia cutis medicamentosum (ECM), or Nicolau's syndrome, is a rare iatrogenic complication following injections, characterized by livedoid dermatitis and cutaneous necrosis. Although most cases occur after intramuscular injections, ECM can also result from other injection types, including hyaluronic acid. This etiology should be considered when a patient presents with erythema, livedoid patches, and tissue necrosis following a hyaluronic acid joint injection, which is commonly used in arthritis to enhance joint lubrication and reduce inflammation.
Case Description:
A 57-year-old male with a history of psoriatic arthritis presented with a rash on his left knee five weeks after receiving bilateral knee injections of hyaluronic acid (Durolane®). He noticed a small lesion spreading in a spiderweb pattern, which later scabbed and turned black. Exam revealed a 13x8 cm necrotic lesion. Laboratory studies showed mildly elevated CRP (0.8 mg/dL), eosinophilia (9%), with normal alkaline phosphatase and lactic acid levels. Initial diagnosis was delayed hypersensitivity reaction with cellulitis, and he was started on broad-spectrum antibiotics. Despite negative cultures, dermatology confirmed ECM with cellulitis from a skin biopsy. He was discharged on oral amoxicillin/clavulanate and topical treatments for ECM.
Discussion:
ECM, first described in 1924, likely results from intraarterial injection or embolization causing tissue ischemia and necrosis. While rare after hyaluronic acid injections, ECM has been reported following intramuscular and other types of injections, presenting with painful, necrotic skin lesions. Early recognition and treatment of ECM are vital to prevent complications, with severe cases requiring surgical intervention. Techniques like Z-track may help prevent ECM sequelae.

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Funding: N/A

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Rural Elder Care

Health care disparities are more prominent in elders who live in rural areas compared to those in urban cities. These include access to care, quality of care, satisfaction with care, health-related quality of life, self-perception of physical health, and independence. This project utilized community health workers (CHWs) from the continuity office locations in Barboursville and Lavalette to address the critical physical, emotional, environmental, and social needs of the target population of aging adults 84 years and older. Once enrolled, 24 patients were administered an Edmonton Frail Scale, activities of

daily living and instrumental activities of daily living assessment, Rand PSQ18, and SF-36 before and after being followed by CHW. Patients in Lavalette saw statistically significant improvements in energy/fatigue (p=0.047), emotional wellbeing (p=0.002), pain (p=0.020), and frailty (p=0.031). Patients at the Barboursville office showed increases in emotional wellbeing (p=0.047) as well as improvements in several other areas that were not statistically significant. Bridging the gap in health disparities between rural and non-rural elders is going to continue to be an ongoing area of research. A major way to accomplish this will be to utilize CHWs as done in this project. Given the small sample size of this project and this being a newer protocol, further projects with more patients and time will likely continue to show even more impact of the CHWs in this role.

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Differential Inflammatory Signaling in Diabetic Mouse Model of Salmonella Typhimurium infection

Type 2 diabetes (T2DM) is a risk factor for bacterial infections including those caused by nontyphoidal Salmonella. Uncontrolled T2DM can result in the extraintestinal spread of Salmonella typhimurium (Stm) and sepsis with no understood etiology. In this study, 8-week-old male TALLYHO (TH) mice were fed a high-fat (HFD) (45% fat) or control diet and monitored for weight gain and blood glucose levels for 8 weeks. At 16 weeks of age, most of HFD mice gained more weight and had diabetic levels of blood glucose. At this time, T2DM and non-diabetic mice were orally infected with 106 CFU (colony forming units) of fully virulent Stm or were left uninfected. Stm spread in T2D mice had increased systemic spread, including to the brain, compared to control. As an intervention, mice were given tributyrin, which is thought to decrease inflammation. Tributyrin supplementation abrogated systemic spread of Stm in non-diabetic mice, but not in T2DM mice. Serum was collected from euthanized mice, and levels of the neural injury signal, S100B, and the pro-inflammatory cytokines IL-6 and IL-1β were quantified via ELISA. S100B was significantly increased in infected mice, and significantly decreased by tributyrin supplementation. Predictably, both IL-6 and IL-1β were increased in HFD mice. IL-6 was increased by infection, but unexpectedly, IL1β was significantly increased by butyrate and decreased by infection ($p<0.001$) perhaps due to IL-6 induction of STAT1. Overall, infection increased the levels of proteins indicating injury but decreased pro-inflammatory signaling. We plan to analyze the differential upstream regulation of these proteins.

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Successful Bronchoscopic Extraction of a Dental Foreign Body Aspirated into Patient's Left Mainstem Bronchus

Foreign body aspiration is a potentially life-threatening emergency that commonly occurs in children but varies widely in clinical presentation. Rapid diagnosis and intervention in foreign body aspiration cases is of the utmost importance to prevent complications such as airway obstruction, infection, and lung injury. While uncommon in adults, most encountered causes occur in the setting of intoxication, neuromuscular weakness, or iatrogenic dental work. Those with dental prostheses are especially susceptible due to the partially attached nature rendering the risk of accidental dislodgement. This report discusses a case wherein an 82-year-old male aspirated a dental bridge into his left mainstem bronchus during routine dental treatment. Flexible bronchoscopy with a urology basket had to be employed for successful removal. The choice of extraction technique via flexible or rigid bronchoscopy largely depends on the specific features and location of the foreign body, but there is much debate as to if certain criteria warrant the usage of one over the other or if flexible should always be first line. Preventive measures, including the use of rubber dams, should be utilized to minimize the risk of aspiration during dental procedures as the downstream effects can be deleterious.

IACUC None required Case Study
Funding: Raleigh General Hospital

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Diffuse Erythema with Seborrhea in a 2 month old

A 2-month-old female with a history of unresolving seborrheic dermatitis and chronic diaper candidiasis presented with diffuse erythematous rash 24 hours after receiving vaccines. Patient had no relevant medical history, no maternal history of MRSA or HSV. Rash began as a vesicular lesion on the cheek, with erythema quickly spreading across head, neck, and inguinal folds, with acute worsening of seborrheic dermatitis on scalp and face. Rash was resistant to over the counter topical nystatin.
On admission, Dermatology consulted and felt presentation was consistent with inverse psoriasis with superimposed infection. She was started on combination Aquaphor/nystatin/bacitracin ointment, Keflex, oral valacyclovir, and exfoliating comb treatments. Skin culture showed mixed flora. Potassium hydroxide examination negative for fungal pathogen with fungal cultures pending until 10/18/24. Valacyclovir discontinued after negative HSV test. After 48 hours, rash improved significantly. On day 3 she was discharged home on short course of Keflex, fluconazole, clindamycin, and topical nystatin.
Dermatology follow up one week later showed significant improvement in rash. Recommended ketoconazole shampoo and ointment with one month follow up.
Inverse psoriasis presents in infants as a “napkin psoriasis” of well demarcated erythematous patches in groin with involvement of skin folds, often moist and without classic silver scaling. Often a clinical diagnosis, but dermoscopy or histopathology can be used to confirm if clinical exam is equivocal. It can be distinguished from candidal rashes by its lack of satellite lesions. It can be managed with topical steroids and calcineurin inhibitors, or systemic immune modulators if severe.

IACUC This was a case report study and no identifying patient information was used.
Funding: none

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Association between Compliance with Wearable Cardioverter-Defibrillator and Up-titration of Therapies for Heart Failure

Background: Patients with left ventricular ejection fraction (LVEF) of <35% are subject to sudden cardiac death (SCD). Both ischemic and non-ischemic cardiomyopathy have been associated with SCD. Several studies have shown the benefits of wearable cardioverter-defibrillator (WCD) against SCD. Data included from STRONG-HF trial has proven rapid up-titration of heart failure medications, leading to improvement in patient outcomes.
Methods: We selected 28 patients with an LVEF <35% and usage of LifeVest WCD in a cross-sectional fashion. Patients’ medications were reviewed, listing and categorizing the four pillars of heart failure with reduced ejection fraction (HFrEF) therapies. Baseline characteristics were included. Concomitantly, LifeVest data was subtracted, analyzing included variables proportioned by the device. Optimization of medication regimen was determined by last visit vitals, including blood pressure and heart rate. However, the average heart rate of LifeVest was determined for average heart rate.
Results: 28 patients with HFrEF had a mean age of 60 years. 64% of these patients were male. The average wear time of the device was 81 days, with an average wear time of 19.76 hours daily. 10% of patients were not on any beta-blockers, 18% of patients were not on ACEI/ARB or ARNI, 39% of patients were not started on SGLT2-inhibitors, and lastly, 43% were not on MRA.
Conclusion: A large number of patients in this study were not appropriately treated for HFrEF. Only 53% of patients were optimized with medications. Interestingly, wear time of WCD did not correlate with the optimization of HFrEF therapies, but patients with a higher rate of compliance with WCD were more adherent with medications. Further studies should be designed to compare this association.

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The Triple Septal Heart: Incidental Finding of Double Atrial Septum in a Patient with Rheumatic Heart Disease

A double inter-atrial septum is a rare congenital anomaly characterized by two parallel septa separating the atria. Its clinical significance is largely unknown, and most cases are asymptomatic, though it may facilitate paradoxical embolism. This case involves a 28-year-old woman with a history of rheumatic heart disease (RHD), who presented with worsening shortness of breath, orthopnea, and ankle swelling. Physical exam revealed bibasilar crackles and a systolic murmur. BNP was elevated and Chest X-ray showed pulmonary congestion. She underwent mechanical replacement of both aortic and mitral valves, tricuspid valve repair, and left atrial appendage mitigation. Intraoperatively, two inter-atrial septa were found, and the thinner one was excised along with closure of a patent foramen ovale. The surgery was well tolerated, and she was placed on anticoagulation therapy. Her heart failure symptoms resolved, and she was discharged with follow-up. While no direct link has been established between a double inter-atrial septum and RHD, congenital heart abnormalities may theoretically affect blood flow or increase infection risk, potentially impacting valve function. However, these conditions are generally considered separately in medical practice. To conclude, the presence of a double inter-atrial septum could contribute to cardiac decompensation and may play a role in the progression of RHD.

IACUC None required for this case report.
Funding: none

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A Systematic Review and Meta-analysis of the Global Prevalence of Human Enteric Adenovirus Infections

Human adenovirus (HAdV), especially HAdV species F (HAdV-F) is recognized as a cause of acute gastroenteritis (AGE) worldwide. To assess the global prevalence of HAdV in case-patients of all ages with AGE, we conducted a systematic literature search for studies published in English during 2015–2022. We generated pooled prevalence estimates using generalized linear mixed models. Using data from 161 included articles, the overall pooled prevalence among AGE case-patients of pan-HAdV was 5.8% and 6.1% for HAdV-F. The prevalence of HAdV was significantly higher among case-patients <5 years of age compared with case-patients ≥5 years of age (pan-HAdV: 6.5% vs. 2.0%, p<0.0001; HAdV-F: 8.8% vs. 2.3%, p=0.0412). Prevalence was significantly higher in high mortality developing countries and lowest in developed countries (pan-HAdV: 9.1% vs. 4.2%, p=0.0001; HAdV-F: 11.6% vs. 3.5%, p=0.0006). Understanding the burden of HAdV-associated AGE may be useful for targeted interventions, including future vaccine development.

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From Sideline to Surgery: Tackling Chronic Syndesmotic Ankle Instability in a College Athlete

Background: Ankle injuries, particularly syndesmotic injuries, are common among athletes and can significantly impact performance if left untreated. This case report highlights the management and surgical intervention of a chronic left ankle syndesmotic injury with heterotopic ossification in a collegiate football player.
Case Presentation: A 23-year-old male collegiate football player presented with chronic left ankle pain following an initial injury in November 2023 during a football game. Despite rehabilitation efforts, the patient experienced recurrent pain and instability during athletic activities. Physical examination revealed tenderness over the anterolateral ankle, and imaging studies, including X-ray and MRI, demonstrated syndesmotic instability, a tear of the transverse interosseous ligament, and heterotopic ossification.
Surgical intervention in April 2024 included arthroscopic debridement, removal of abnormal bone formation, and open repair of the unstable syndesmosis using a tightrope fixation. Postoperative recovery was uneventful, with progressive improvement in ankle stability and function. At the six-week follow-up, the patient was transitioning to full weight-bearing with the use of a lace-up ankle brace and continued physical therapy.
Conclusion: This case illustrates the importance of early recognition and appropriate surgical management of chronic syndesmotic injuries in athletes. Syndesmotic instability, if untreated, can lead to long-term functional limitations and performance decline. Surgical debridement and stabilization, combined with a structured rehabilitation program, can result in favorable outcomes, allowing athletes to return to pre-injury levels of activity.

IACUC None required Case Report
Funding: none

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A Curious Case of Congenital Neurocutaneous Melanosis

Congenital Neurocutaneous Melanosis (CNM) occurs in approximately 1 in 20,000 births, marked by large or multiple congenital melanocytic nevi and benign or malignant pigment cell tumors of the leptomeninges. Presenting a case of a newborn with hyperpigmented nevi covering over 50% of her body.
A newborn girl delivered vaginally at 40+1 GA to a 33-year-old mother (G4P3) with a complicated pregnancy history. The mother had no history of illicit drug use. The membranes were artificially ruptured three hours before delivery with clear fluid with terminal meconium. The mother received 4 doses of Ampicillin being Group B Streptococcus (GBS) positive; all prenatal screening labs were negative. At birth, baby had Apgar scores of 9 and 9. Initial examination revealed hyperpigmented lesions covering >50% of her body. The skin showed blistering and bleeding with bullae formation. Notably, the anus was deformed, with sacral dimpling and swollen labia. Neurological exam was normal. A full septic workup was performed, and empiric antibiotics were initiated. Initial infectious workup yielded negative results. Inflammatory markers and coagulation profiles were within range.

Given the extensive hyperpigmented lesions, pediatric dermatology and neurology were consulted, and the infant was transferred to Cincinnati Children's Hospital for further evaluation. Upon assessment, the infant was diagnosed with CNM. An MRI of the brain and spine revealed hyperintensity foci consistent with neurocutaneous melanosis.
Early intervention with multidisciplinary team involvement is essential for management of these patients. In conclusion, this case underscores the complexities of diagnosing and managing CNM.

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Funding: N/A

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Atypical Presentation of Non-Small Cell Lung Adenocarcinoma with Metastasis to Breast Tissue

Malignant neoplasms of the lung commonly metastasize to lymph nodes, bone, brain, and liver via hematogenous and lymphatic routes. Much less commonly there is metastasis to the breast. Secondary metastatic disease of the breast is very rare, with a reported incidence ranging from 0.4-1.3% (10) – with primary lung cancer being one of the most anomalous sources. We present a case of non-small cell lung cancer metastasis to the breast with proven primary contralateral lung origination.
This atypical finding prompts us to consider the immunologic, histologic, and pathologic makeup of these malignant cells to further understand and treat the neoplasm.

IACUC none required, case report
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Prevalence of Cancer Amongst Children in Rural Areas of West Virginia

Background: Cancer rates among young African Americans in West Virginia are 18% higher than those of other racial groups, contributing significantly to the state's mortality rates. Over 75% of the population lives in rural Health Professional Shortage Areas (HPSAs), where limited healthcare access, transportation barriers, poverty, and low health literacy exacerbate the cancer burden. This study aims to explore the factors contributing to the higher prevalence of cancer in young African Americans in these underserved areas.
Objective: This research seeks to identify key knowledge gaps and barriers that lead to the elevated cancer prevalence among young African Americans in rural West Virginia. Findings will inform strategies to reduce health disparities and improve cancer outcomes in minority populations in the region.
Methods: The study will distribute electronic surveys to minority cancer patients or survivors in rural hospitals and healthcare facilities across West Virginia. The anonymous surveys, containing 15-20 questions with open-ended and scaled responses, will cover topics such as healthcare access, health literacy, and socio-economic factors. Participants will receive a $10 gift card as an incentive for completing the survey. In addition, secondary data from the West Virginia Bureau for Public Health will provide further context on cancer trends in rural areas. All data will be securely managed using the REDCap system.
Current Status and Next Steps: Data collection is currently underway, though the dataset is not yet large enough to present significant trends or conclusions. This presentation will focus on the study's background, methodology, and expected outcomes, providing an overview of the research design and the potential impact of the findings. As data collection continues, the study aims to uncover key factors contributing to cancer prevalence in rural minority populations, with results expected to shape future healthcare strategies aimed at reducing disparities.

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The Study of Effective Storage Methods of Bacillus anthracis Sterne Strain for Long-term Use

Research regarding Bacillus anthracis , the causative agent of anthrax, commonly focuses on samples collected from the environment. B. anthracis Sterne strain is a nonvirulent variant that is useful for academic and pharmaceutical research. The Sterne strain variant is attenuated by the removal of the pX02 plasmid (Benn Felix et al., 2020). This plasmid provides genetic information for the protective capsule that allows B. anthracis to evade the

immune system. Sterne strain can be used at a BSL-2 level, allowing for higher availability amongst research institutions (Greenberg, Busch, Keim, & Wagner, 2010). Storing the variant for long-term viability is not well detailed. To offer information for all levels of use, the temperatures 4, -20, and -80 Celsius were evaluated for the effect on the viability of bacteria. Glycerol provides a carbon source and cryoprotective effect for bacterial survival; in this project 5, 10, and 15% glycerol concentrations were tested. For broad applicability, various broths were evaluated including Brain-heart infusion (BHI), phosphate-buffered saline (PBS), Luria broth (LB), nutrient broth (NB), and Todd Hewitt broth (THB). Survivability of bacteria decreases significantly with time. The broth type and temperature had a statistically significant impact on the viability of bacteria, but glycerol concentration did not. This study will be expanded to include murine lung tissue with the most effective broth (BHI) and PBS as a control, with the same glycerol concentrations. The study was limited in the number of replicates but offers basic information on the long-term viability of a readily available form of B. anthracis.

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