Detection of Somatic *PIK3CA* Mutations in Lymphatic Malformation Tissue Using Droplet Digital PCR

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Background: Lymphatic malformations (LMs) are congenital vascular anomalies characterized by abnormal lymphatic development and tissue overgrowth. Somatic gain-of-function mutations in *PIK3CA*, a central part of the *PI3K-AKT-mTOR* signaling pathway, are increasingly recognized as a primary driver of LM pathogenesis. Detection of mutations can be challenging due to low-level somatic mosaicism within affected tissues.

Objectives: To evaluate the utility of droplet digital PCR (ddPCR) for sensitive detection of recurrent somatic PIK3CA mutations in LM tissue.

Methods: Genomic DNA was isolated from a total of 72 LM tissue samples and analyzed using ddPCR assays targeting four common activating *PIK3CA* mutations (*p.E542K*, *p.E545K*, *p.H1047R*, and *p.H1047L*). Samples were partitioned into thousands of nanoliter-sized droplets and amplified using mutation-specific fluorescent probes, allowing quantification of mutant and wild-type alleles. Appropriate positive, negative, and no-template controls were included to ensure assay sensitivity and specificity.

Results: ddPCR analysis identified *PIK3CA* mutations in a significant proportion of LM tissue samples, with an overall detection rate of 72%**.** The most frequently identified variants were *p.E542K* (22%), *p.E545K* (29%), which are well-characterized mutations previously implicated in *PIK3CA*-related overgrowth syndromes. Detected mutations were often present at low variant allele frequencies, consistent with somatic mosaicism.

Conclusions: These findings confirm that somatic *PIK3CA* mutations are present in most lymphatic malformation tissue and demonstrate that ddPCR is a sensitive and reliable method for detecting low-level somatic mosaicism. Future studies will evaluate mutation-specific effects on PI3K pathway gene expression, as well as targeted therapeutic strategies.

Submitted by Alexander Burnett

Systemic Nickel Allergy Syndrome (SNAS) - A Systematic Review Highlighting Multisystem Manifestations and Dietary Management

Background

Systemic nickel allergy syndrome (SNAS) is an underrecognized immune-mediated condition occurring in individuals sensitized to nickel who subsequently develop systemic symptoms after oral or cutaneous nickel exposure. The present authors saw a patient with a history of allergic contact dermatitis to nickel experience resolution of hand dermatitis, chronic pain (diagnosed as fibromyalgia), and chronic diarrhea (diagnosed as irritable bowel syndrome) with a low-nickel diet after just one month. She was diagnosed with SNAS, and this intriguing case prompted the review which follows.

Objectives

To describe a clinical case of SNAS and review its multisystem manifestations, diagnostic approach, and therapeutic strategies, with emphasis on dietary management.

Methods

A case of a patient with known nickel contact dermatitis and chronic gastrointestinal and pain symptoms was evaluated. Clinical response to dietary intervention was observed. A systematic review of the related literature was conducted focusing on SNAS symptomatology, diagnosis, and treatment options.

Results

Literature review demonstrates that SNAS commonly manifests as both cutaneous and extracutaneous symptoms. Diagnosis relies on a history of nickel allergy, symptom improvement with dietary nickel restriction, and confirmatory oral nickel challenge. Dietary modification remains first-line therapy, with evidence supporting immunomodulatory and microbiome-targeted interventions.

Conclusion

SNAS should be considered in patients with unexplained multisystem symptoms and a history of nickel sensitivity. Recognition of SNAS has important implications for clinical practice, as targeted dietary intervention may significantly improve quality of life and reduce unnecessary diagnostic testing. Further research is needed to define prevalence, optimal screening strategies, and additional long-term management options.

Submitted by Allison Freeman

Authors: Arshdeep Gill, Dr. Sarah Assem, MD
Institution: Alice L. Walton School of Medicine

Title

Implementing a Structured Pediatric-to-Adult Health Transition Framework in an Arkansas Primary Care Setting

Background

The proportion of deaths in people aged 0-24 years occurring in the 10-24 age group has more than doubled since 1950, while US adolescent mortality rates increased 15% during 2013-2017.[1,2] The transition from pediatric to adult health care is a vulnerable period associated with fragmented care and may be contributing to these trends. Despite recommendations from the American Academy of Pediatrics, many clinics still lack a standardized health care transition process.

Objectives

To implement a structured pediatric-to-adult care transition process using the Six Core Elements of Health Care Transition framework (Got Transition) in Northwest Arkansas clinics without an existing formal transition program.

Methods

Initial efforts focus on two core elements: (1) dissemination of a written transition and care policy, and (2) administration of a standardized transition readiness assessment for patients aged 14–18 years. Existing, publicly available tools will be adapted for local use. Baseline assessment of current transition practices will be conducted prior to implementation. Process measures will include the proportion of eligible patients receiving a transition policy and completing a readiness assessment.

Results

At baseline, no formal transition policy or standardized transition readiness assessment was in use at the study site. The implementation process is currently in progress.

Conclusions

This project demonstrates the feasibility of initiating a structured health care transition framework in a real-world clinical setting. Early implementation focuses on foundational process measures rather than long-term outcomes. Findings from this initiative may inform broader adoption of standardized transition practices.

Submitted by Arshdeep Gill

Reference List

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2. Woolf SH, Schoomaker H. Life Expectancy and Mortality Rates in the United States, 1959-2017. *JAMA*. 2019;322(20):1996-2016. doi:10.1001/jama.2019.16932

Submitted by Arshdeep Gill

Title: Renal Safety of Sugammadex in Chronic Kidney Disease

Presenter: Andrew Griffin B.S.

Mentor: Hanna Jensen, M.D., Ph.D.

Co-authors: Ashlyn Fuccello M.S., John Arthur M.D., Ph.D., Alvin Stewart M.D.

Background: Sugammadex is a reversal agent for neuromuscular blockade utilized during surgery. It is predominantly renally eliminated. FDA labeling advises against the use of sugammadex in patients with severe renal impairment. Despite this, it has been increasingly adopted in clinical practice, generating uncertainty regarding renal safety in patients with chronic kidney disease (CKD).

Objectives: We wanted to evaluate the institutional use patterns of reversal use and compare postoperative acute kidney injury (AKI) after sugammadex versus neostigmine among patients with CKD undergoing noncardiac surgery.

Methods: We performed a retrospective cohort study of adults with CKD undergoing elective noncardiac surgery with general anesthesia and endotracheal intubation at UAMS (5/1/2014-12/31/2020). The included patients received steroidal neuromuscular blockade with reversal by neostigmine or sugammadex.

Results: The final cohort included 920 patients. Postoperative AKI incidence did not differ between groups (19.35% neostigmine vs 17.81% sugammadex; p=0.56). Sugammadex adoption increased over time and accounted for 96.9% of included cases by 2020. Neostigmine was preferentially used in higher-acuity patients, including a higher prevalence of CKD stage G5 and lower median preoperative eGFR.

Conclusions: Among CKD patients undergoing elective noncardiac surgery, sugammadex was not associated with higher postoperative AKI compared with neostigmine. However, neostigmine was used disproportionately in patients with more advanced renal disease, suggesting confounding by indication and underscoring the need for risk-adjusted analyses.

Submitted by Andrew Griffin

Hiatal Hernia Associated Aspiration as a Contributor to Bronchiectasis: A Case Report With Longitudinal Imaging Correlation

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Background

Bronchiectasis is a chronic airway disease affecting roughly 500,000 individuals in America. While 50% of cases are attributable to cystic fibrosis, non–cystic fibrosis bronchiectasis (NCFB) has a broad differential of causes including infection and immune conditions. However, recurrent aspiration remains an underrecognized cause of NCFB. Increasing evidence suggests chronic microaspiration related to gastroesophageal reflux disease (GERD) and hiatal hernia (HH) as a potential driver of lower-lobe predominant NCFB.

Objectives

To describe a case of bronchiectasis in the setting of recurrent HH, supported by CT findings consistent with chronic aspiration, and to highlight characteristic image findings that suggest an aspiration related mechanism of airway injury.

Methods

Retrospective case analysis of a patient diagnosed with bronchiectasis and HH and review of High-resolution chest CT's for aspiration related lung injury using a standardized aspiration scoring system.

Results

A 72-year-old female with history of GERD, recurrent pneumonia, and failed hiatal hernia repair demonstrated lower-lobe predominant cylindrical bronchiectasis and moderate HH with intrathoracic stomach. Chest CT showed multiple findings consistent with chronic aspiration, including tree-in-bud opacities, centrilobular nodules, dependent consolidation, mucus plugging, and bronchial wall thickening. The overall aspiration score was 5/7.

Conclusions

This case supports chronic aspiration related to HH as a likely contributor to the development of bronchiectasis. CT findings can help support an aspiration-related mechanism of airway injury. Earlier recognition of these patterns may help identify potentially treatable causes of airway injury and inform management strategies aimed at slowing progression to irreversible bronchiectasis.

Submitted by Aniqa Islam

Inpatient Pharmacological Treatment of Methamphetamine-Induced Psychosis

Anirudh Iyer, ARCOM OMS4

Background:

- Psychosis in patients who have a recent history of methamphetamine use accounts for a significant portion of inpatient psychiatric hospitalizations, and treatment regimens for this condition are complex and individualized.

Objective:

- To summarize treatment options for meth-induced psychosis in the inpatient setting and outline appropriate options for discharge medications.

Methods:

- A focused narrative literature review was performed to summarize inpatient pharmacologic treatment strategies for methamphetamine-induced psychosis.

Results:

- Treatment options for methamphetamine induced psychosis in the inpatient setting are most commonly a limited variety of antipsychotics and benzodiazepines. The treatment regimen of patients with methamphetamine induced psychosis varies based on time since last use of methamphetamine, medical comorbidities, and other psychosocial factors.

Conclusions:

- While abstinence from meth use is widely agreed to be the best way to prevent future episodes of psychosis in meth using patients, the consistency of care for patients with methamphetamine induced psychosis would benefit from an evidence based, algorithmic standardization of pharmacological treatment protocol for inpatient treatment and discharge medication.

Submitted by Anirudh Iyer

Bacteriophages in Dermatologic Surgery

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Background

Bacteriophages—viruses that specifically target bacteria—provide highly targeted pathogen eradication while conserving commensal flora. This specificity, combined with their ability to replicate at the site of infection, provides a dynamic, self-amplifying antimicrobial mechanism.

Bacteriophage therapy is a promising therapeutic modality with considerable potential in dermatologic surgery. Soft-tissue infections caused by difficult-to-treat pathogens, including methicillin-resistant Staphylococcus aureus (MRSA), are routinely encountered in surgical practice. Conventional antibiotics are increasingly limited by resistance and carry risks such as microbiome disruption and systemic adverse effects. These challenges highlight the potential of bacteriophage therapy to improve the management of postoperative infections in dermatologic surgery.

Objectives

To review current literature and evidence on bacteriophage therapy, including mechanisms of action, clinical applications, and future directions relevant to dermatologic surgery.

Methods

A narrative review of the literature was conducted, focusing on bacteriophage therapy in dermatologic and surgical contexts.

Results

A literature review indicates that bacteriophage therapy offers several advantages over systemic therapies in dermatologic surgery. These advantages include targeted pathogen activity while preserving commensal bacteria, self-replication upon infection, effective penetration of microbial biofilms, and a reduced risk of antimicrobial resistance and dysbiosis. Future development directions include point-of-care bedside delivery systems, CRISPR-enhanced phages targeting resistance genes, personalized phage cocktails based on susceptibility testing, and formulation stability.

Conclusion

Bacteriophage therapy is well-suited to the unique challenges of dermatologic surgery and offers promising advantages in the face of current antimicrobial resistance. Continued research, clinical trials, and regulatory approval are imperative to support its incorporation into surgical practice.

Submitted by Ashleigh Letterman

“Upadacitinib as an Off-Label Treatment for Refractory Esophageal Lichen Planus”

Lichen Planus is an idiopathic disorder with cutaneous involvement that frequently affects mucosal surfaces. Esophageal involvement is uncommon, and refractory cases carry a risk of malignant transformation. Standard therapies for esophageal lichen planus (ELP) include corticosteroids and systemic immunosuppressants. We present the case of an 81-year-old male with ELP who experienced the symptoms of dysphagia, odynophagia, and weight loss for over three years. The patient underwent 19 esophageal dilations and failed several traditional treatments such as long-term prednisone, azathioprine, mycophenolate mofetil, methotrexate, and oral budesonide. After nearly one year of persistent symptoms and repeated esophageal dilations, treatment with upadacitinib 15 mg daily was initiated. Within six weeks, the patient reported significant improvement of dysphagia and odynophagia. One year after initiation of upadacitinib therapy, his symptoms completely resolved, including restoration of his pre-illness body weight. This case highlights the potential role of upadacitinib, a JAK inhibitor, in the treatment of refractory ELP. Previous reports have also described successful use of upadacitinib as well as other JAK inhibitors in the treatment of ELP, supporting this therapeutic approach. Given the chronic and often refractory nature of ELP, upadacitinib represents a promising off-label treatment option for patients unresponsive to traditional therapies. Larger studies are warranted to establish safety and efficacy profiles.

Submitted by Ashleigh Letterman

The Estrogen Effect: Hormone Therapy and Fusion Integrity in Spinal Arthrodesis

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Abstract

Introduction

Estrogen plays a key role in maintaining bone strength by promoting osteoblast activity and supporting bone remodeling. Its deficiency after menopause impairs bone healing and increases the risk of nonunion following fusion. Hormone replacement therapy (HRT) may improve bone quality and graft incorporation, but its overall effect on fusion outcomes remains unclear. This study examined whether preoperative estrogen HRT is associated with differences in fusion integrity following spinal arthrodesis.

Methods

A retrospective cohort study was performed using the TriNetX Research Network. Postmenopausal women (≥55 years) who underwent cervical, thoracic, or lumbar spinal fusion were divided into cohorts with and without preoperative estrogen hormone replacement therapy (HRT). Propensity score matching (1:1) was performed for demographics, comorbidities, and procedural factors, ensuring patients were matched by fusion region and instrumentation level to maintain surgical equivalence. Outcomes included pseudarthrosis (nonunion), implant loosening or mechanical failure, and revision spinal fusion at 1-, 3-, and 5-years postoperatively. Risk ratios (RRs) with 95% confidence intervals (CIs) were calculated, with statistical significance defined as $p < 0.05$.

Results

At 1 year, pseudarthrosis rates were similar between HRT and non-HRT cohorts (19.4% vs 17.9%; RR 1.08, 95% CI 0.88–1.34, $p = 0.47$). At 3 years, pseudarthrosis (21.8% vs 20.6%; RR 1.06, $p = 0.57$) and implant loosening (3.3% vs 1.9%; RR 1.79, 95% CI 0.94–3.41, $p = 0.07$) remained comparable. By 5 years, pseudarthrosis (23.6% vs 21.4%; RR 1.11, $p = 0.29$) and implant loosening (4.3% vs 2.5%; RR 1.68, 95% CI 0.96–2.94, $p = 0.06$) continued to show no significant difference. Revision fusion and fixation-device reinsertion rates were not statistically different at any interval (all $p > 0.4$).

Conclusion

Preoperative estrogen HRT was not associated with increased risk of pseudarthrosis or implant loosening across spinal regions, suggesting comparable fusion integrity between groups. The trend toward higher long-term mechanical complications among HRT users may reflect hormonal influences on bone remodeling and fixation stability, warranting further investigation.

Submitted by Angel Ramnani

Left Ventricular Assist Device (LVAD) Outcomes: A Single Institution Analysis

By: Benjamin Alexander, Ashley Wilson, Christian Eisenring, Meagan Rogers, Taufiek K. Rajab, Brian Reemtsen and Lawrence Greiten

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Background

Pediatric patients awaiting orthotopic heart transplantation face prolonged waiting periods compared to their adult counterparts. Left ventricular assist devices (LVADs) serve as a critical bridge-to-transplant strategy, with the potential to reduce morbidity and mortality while patients await donor organ availability. We sought to evaluate LVAD outcomes at our institution to better understand its role in supporting pediatric patients awaiting transplant.

Methods

Data was collected from 14 pediatric patients that were implanted with LVAD's as a bridge to transplant at Arkansas Children's Hospital between 2022 and 2026. This cohort was followed for clinical outcomes including survival, time to transplant and other major adverse events.

Results

Median age of LVAD implant was 5.1 years (IQR: 0.3; 11.2) with 43% being female. Median body surface area (BSA) was 0.75 (IQR: 0.31;1.27). 9 patients had diagnosis of dilated cardiomyopathy, 3 patients had congenital heart disease, and 1 patient had systolic heart failure secondary to viral infection. The median duration of LVAD was 202.5 days (IQR: 132.5; 328.3), with a 0% all-cause mortality in the first 30 days. 71.4% of patients (n = 10) survived to orthotopic heart transplant (OHT), with two deaths occurring at 476 and 267 days respectively. 14% of patients were changed from non-pulsatile (PediMag) to pulsatile flow (Berlin Heart LVAD) without demonstrating signs of morbidity or mortality. Median time to transplant occurred at 230 days (IQR: 163; 382.5).

Conclusion

Our findings support the use of LVAD as an effective bridge-to-transplant strategy in pediatric patients, with favorable outcomes observed across our cohort. Notably, successful outcomes in patients below traditional LVAD thresholds suggest that earlier implantation may extend benefit to a broader pediatric population. Additional research is needed to establish optimal timing for LVAD intervention.

Submitted by Benjamin Alexander

Spontaneous Intracranial Hemorrhage in the Absence of Traditional Risk Factors

Authors: Bibi S. Kassim; Behnam Javidfar; Donald Sanders, DO

Affiliations: Arkansas College of Osteopathic Medicine; Eastern Oklahoma Medical Center

Spontaneous intracranial hemorrhage arising from uncommon precipitants such as forceful coughing is clinically important because it may occur in the absence of traditional risk factors like hypertension or anticoagulation, leading to delayed recognition and diagnosis.

A 41-year-old female presented to the emergency department for evaluation of a suspected intracranial hemorrhage. Her husband reported a one-week history of cough, followed by an episode of forceful coughing associated with sudden-onset severe vertex headache. Shortly thereafter, the patient developed tingling involving the left side of her face, left arm, and left leg. Airway, breathing, and circulation were promptly assessed and stabilized. On physical examination, she exhibited bilateral spontaneous nystagmus, left-sided facial droop, and weakness of the left upper and lower extremities. She was alert, oriented, able to follow commands, and answered questions appropriately. She had no significant past medical history, and her only medication was tirzepatide (Mounjaro), which she was using for weight loss. The patient was treated with levetiracetam and acetaminophen. Laboratory studies revealed leukocytosis and hypokalemia. Noncontrast CT of the head demonstrated a right basal ganglia intraparenchymal hemorrhage measuring 1.4 × 1.2 × 1.8 cm with extension into the right midbrain and intraventricular involvement of the lateral, third, and fourth ventricles. Urgent neurosurgical consultation was recommended, and the patient was transferred via ambulance to Mercy for higher-level care.

Spontaneous intracranial hemorrhage from atypical or nontraditional precipitants is clinically significant because approximately 10–20% of spontaneous intracranial hemorrhages occur in the absence of classic risk factors such as chronic hypertension or anticoagulation, increasing the risk of delayed diagnosis. While the majority of cases are attributable to hypertension or anticoagulant use, this substantial minority highlights the importance of considering alternative mechanisms. Sudden physiologic stressors may lead to abrupt elevations in intracranial pressure and vascular rupture, particularly in susceptible cerebral vessels. Recognizing these uncommon presentations is critical, as prompt neuroimaging and early intervention in patients with acute headache and focal neurologic deficits can reduce secondary brain injury and improve overall outcomes.

Submitted by Bibi Kassim

Chiari and Sleep

Blakely Greer Norris, Mukta Vibhute, Rachel DeGood, Peter Eckard, Gresham Richter

INTRODUCTION: Sleep-disordered breathing (SBD) is common in children, but its relationship with Chiari I malformation remains poorly understood. Families often undergo extensive testing without guidelines to direct workup. Whether Chiari causes central apnea due to brainstem compression, or obstructive events from airway crowding is debated. Given their role in airway and sleep, otolaryngologists play an essential role in the multidisciplinary management of these patients.

OBJECTIVE: To describe the prevalence and mechanism of SBD in children with Chiari 1 and 1.5 malformations and examine the value of sleep questionnaires.

METHODS: We performed a retrospective review of patients < 18 years with Chiari 1 or 1.5 malformation who underwent polysomnography (PSG) between 2014-2025. Index PSG was defined as the most recent pre-decompression diagnostic study. Patients without an index PSG, incomplete data, or Chiari II or higher were excluded. Demographics, PSG metrics, surgical history, and questionnaire data were abstracted.

RESULTS: Eighty-seven patients with Chiari malformation were identified; 39 met inclusion criteria. Median age at diagnosis was 8.4 ± 4.4 years (58.9% female). Mean AHI was 4.3± 5.7 events/hr. SBD mechanism was classified as predominantly central in 5%, mixed in 2%, obstructive in 18%, and absent in 51%. Mean SpO2 nadir was 91%±4.3. Sleep questionnaires were available in 31 patients. Epworth Sleepiness Scale (n=24) averaged 8.0±5.2 (range 0-24), with 25% scoring > 10. Prematurity was noted in 33% and developmental delay in 26%.

CONCLUSION: Preliminary results show most children with Chiari I malformation did not demonstrate SBD, although both central and obstructive sleep patterns were observed. Questionnaires revealed symptom burden in a subset of cases, highlighting the role of otolaryngology in directing evaluation and the need for clearer guidelines.

Submitted by Blakely Norris

Microdebrider Assisted Lingual Tonsillectomy Surgical Techniques

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Background: Lingual tonsillar hypertrophy can contribute to obstructive sleep apnea (OSA) and can be managed with lingual tonsillectomy (LT). Different surgical techniques have been utilized, but no consensus has been established. This study aims to compare the safety and efficacy of microdebrider assisted lingual tonsillectomy (MALT) to coblation or electrocautery surgical techniques.

Methods: Retrospective cohort study of all patients with lingual tonsillectomy from 2018-2025 at a tertiary care institution. MALT was performed with local vasoconstrictor injection. Patient demographics, comorbidities, sleep history, treatment, and sleep apnea outcomes were analyzed using Fischer's exact test or ANOVA where appropriate.

Results: There were 74 patients identified who underwent LT at a mean of 10.8 (SD 4.5) years old for OSA. 39 patients underwent MALT and 33 underwent LT with a different technique, including 31 with coblation and 2 with electrocautery. There was no difference in operative time (111.5 vs 108.3 min, p=0.88). MALT was similarly effective at reducing the apnea hypopnea index (AHI) compared to LT with coblation or electrocautery with a mean AHI reduction of 9.3 and 5.7 (p=0.10), respectively. No patients had post-operative hemorrhage, new dysphagia, or hypoglossal nerve injury. There was no difference in the 30-day readmission rate (10.2% vs 9.1%, p=0.63), and only one patient who underwent LT with coblation had a readmission due to airway concerns.

Conclusions: MALT technique has a similar safety profile and efficacy to coblation or electrocautery LT techniques.

Submitted by Blakely Norris

Targeted Resection of Large Volume Vascular Malformations using NBCA Embolization

Blakely Norris[1], Mukta Vibhute[2], Jeremy Sabado[3], Kumar Shashi[3], Scott Schoenleber[3], Gresham Richter[1,2,3]

Background: Large vascular malformations can be challenging lesions to resect with risk for major bleeding and postoperative complications. Preoperative glue embolization can convert these high-risk operations into targeted and safe procedures in a staged multimodal treatment strategy. This study evaluates surgical outcomes in patients following surgical resection of targeted large volume vascular malformations using NBCA embolization.

Methods: We performed a retrospective review of 68 patients undergoing glue-based embolization for vascular malformations from 2019 to 2025. Data included lesion type and size, embolization details, and interval between embolization and surgery. Surgical variables included operative time, intraoperative blood loss, postoperative wound infection or dehiscence, surgical length of stay, and return to the operating room. Additional long-term interventions were recorded.

Results: Fifty-one patients (median age 16 years) underwent surgery after glue embolization. Median largest diameter was 5.0 cm, with 25% of lesions exceeding 7 cm, and 16% exceeding 10 cm. Technical success of embolization of the targeted surgical area was achieved in 96% of cases. Median time from embolization to surgery was 1 day. Median intraoperative blood loss was 50 mL, and 15.7% of patients required transfusion. Postoperative wound complications were uncommon, with infection in 11.8% and breakdown in 7.8%. Only 3.9% returned to the operating room. Recovery was rapid, with a median postoperative length of stay of 0 days (IQR 0–1), allowing most patients to be discharged the same-day or after an overnight stay.

Conclusion: Preoperative glue embolization supports targeted and efficient resection of large volume vascular malformations with minimal blood loss and favorable postoperative recovery. These findings underscore the value of coordinated surgical and interventional management of more challenging vascular malformations.

Submitted by Blakely Norris

Title: Hidden Weights: Prevalence of Social Determinants of Health in Adolescents with Eating Disorders

Background: Eating disorders are complex illnesses that arise from the intersection of biologic, psychologic and social drivers. Historically eating disorders were thought to occur in individuals of high socioeconomic status (SES), though in the last decade there has been increasing recognition of these disorders across all SES. Additionally, there is increasing awareness of food insecurity —one component of social determinants of health—in this population. This study aims to evaluate the presence and association between eating disorder diagnoses and social determinants of health beyond food insecurity in individuals age 10 to 25 years.

Methods: We conducted a retrospective cross-sectional analysis using the Epic Cosmos electronic health record database. We identified adolescent and young adult (AYA) patients (aged 10–25) with diagnosed eating disorders and documented social determinants of health screening in between July 2020 and July 2025. Patients were grouped by exposure status: Any eating disorder diagnosis, Anorexia Nervosa, Bulimia Nervosa, Avoidant/Restrictive Food Intake Disorder, Binge Eating Disorder, Other Specified Eating Disorder, and No Eating Disorder Diagnosis. Outcome measures included financial strain, food insecurity, housing insecurity, and social connection. We calculated odds ratios (ORs) to assess the likelihood of adverse social determinants of health in individuals with eating disorders versus those without eating disorders.

Results: Patients were included In this study with varied number of individuals with documented social determinants of health (SDoH) data; majority of the population being White, Non-Latinx, and Female. Overall, patients with eating disorders were more likely to have financial strain, food insecurity, transportation needs and housing insecurity than the general population (e.g., ORs ranged from 1.21 to 1.97). AYAs with EDs were as likely as—and in some cases, more likely than—youth without eating disorders to be socially connected in their community.

Conclusions: Surprisingly, patients with eating disorders were screened for SDOH at nearly double the rate of the general population, though overall the rate of screening remains low in this population. Adolescents and young adults with eating disorders experience a disproportionate burden of adverse social determinants of health—including financial strain, food insecurity, housing insecurity, and transportation needs—when compared with peers without eating disorders. These findings highlight the importance of screening for social context as part of comprehensive eating disorder care, as unmet social needs may exacerbate illness severity and limit recovery. Future work should examine how targeted interventions addressing SDoH can be integrated into clinical and community-based treatment models to reduce disparities and improve outcomes for this vulnerable population.

Submitted by Bianca Rochelle

Benjamin Tan

Characterizing Real World Use of Delandistrogene Moxeparvovec at a Tertiary Care Facility

Delandistrogene moxeparvovec is one of several commercially approved gene therapies for Duchenne Muscular Dystrophy (DMD), but real-world post-infusion safety data remain limited. The goal of this project is to characterize real world post-infusion safety outcomes in patients with DMD being treated with delandistrogene moxeparvovec.

Retrospective chart review was conducted on 12 ambulatory patients, aged 7-16, seen at Arkansas Children's Hospital, the only pediatric tertiary care center in Arkansas. Patients had a history of baseline corticosteroid use and were monitored for 3 months, following treatment-related toxicities, liver enzymes, cardiac structural changes, and troponin levels. Treatment-related toxicities were defined based on clinician documentation and laboratory abnormalities.

Of the 12 patients, 11 experienced treatment-related toxicities, but only 2 required an escalation of corticosteroids. Most common among these side effects were mild-to-moderate GI symptoms (n=9), liver enzyme abnormalities (n=6), acute liver injury (n=2), and troponin elevations (n=1). GI symptoms included nausea and vomiting within the first few days after administration; all cases required anti-emetics and resolved after a maximum of a week post-infusion. One case of acute liver injury resolved spontaneously while the other required an escalation in corticosteroid use. The case of troponin elevation resolved without an escalation in corticosteroid use, but it was associated with a newly identified structural abnormality on echocardiography.

These findings highlight the incidence of early, predominantly low-grade toxicities and show that hepatic and cardiac complications, though less common, merit close surveillance in real-world practice. Longer-term follow-up and multicenter studies with larger cohorts are needed to better clarify the durability of these effects, identify predictors of high-grade toxicities, and optimize peri-infusion corticosteroid protocols.

Submitted by Benjamin Tan

Reassessing Management Strategies for Seizures and Headache After Traumatic Brain Injury: A Scoping Review for the 2026 UAMS IDHI Brain Injury Program Clinical Guidelines

Althoff, Claire, BA., Reyes, Emory, DO., Roedel, Krystian, BS., Dudley, Henry, BS., Peyton, John, BS., Browning, Morganne, BS., Gardner, Rani, MD.

Background: Post-traumatic headaches (PTH) and post-traumatic seizures (PTS) are common sequelae of traumatic brain injury (TBI) that contribute to long-term morbidity. Given ongoing advances, clinical guidelines require periodic review to ensure current evidence-based practices.

Objective: To evaluate current literature on post-TBI PTH and PTS to update regional clinical guidelines.

Methods: A scoping review was conducted in accordance with PRISMA-ScR guidelines using MEDLINE, EMBASE, and Web of Science. Eligible studies examined adult populations across all TBI severities and included systematic reviews, meta-analyses, and randomized controlled trials. Key conclusions were extracted into a matrix table and assessed for quality.

Results: The PTH search yielded 294 records; 21 underwent full-text review, with 7 included. The PTS search yielded 354 articles; 25 underwent full-text review, and 3 included. PTS literature demonstrated seizure prophylaxis may reduce early PTS in mild to moderate TBI. Additional recommendations included preference for levetiracetam over phenytoin and limiting prophylaxis duration to ≤ 7 days. PTH literature emphasized individualized, symptom-targeted management. Non-pharmacologic interventions, including sub-symptom threshold aerobic exercise, Cognitive Behavioral Therapy, and multidisciplinary care, demonstrated improvements in headache-related disability and quality of life. Preliminary evidence suggested a potential benefit of rTMS and CGRP-targeted therapies, though effects were modest and data limited.

Conclusions: This scoping review synthesized current evidence to inform updates to regional PTH and PTS guidelines. As these guidelines are utilized by multidisciplinary practitioners across the regional trauma system, findings support evidence-informed, standardized decision making across diverse clinical settings. Ongoing evaluation is essential to maintain guideline relevance and clinical impact.

Submitted by Claire Althoff

Parts to the Lit Review:

- Pre-pregnancy care
    - Contraception
    - Control chronic conditions
- Prenatal
    - education
- Postpartum
- Policy in Arkansas
- What other states are doing to improve mortality
    - Access to medicine
        - Telehealth
        - Doula services
        - Midwife
    - Coverage expansion
        - Extended Medicaid coverage postpartum
        - Expand Medicaid to cover doulas

Abstract:

Maternal health outcomes in the United States reveal persistent and widening disparities, with Arkansas consistently reporting maternal morbidity and mortality rates above the national average. This literature review examines the contributing factors to maternal health outcomes in Arkansas, including contraception, prenatal care, and the postpartum period. The reviewed literature highlights cardiovascular disease as a leading cause of pregnancy-related death, exacerbated by delayed diagnosis, inadequate postpartum follow-up, and limited access to specialized care. Factors that further compound maternal risk include rural residence, socioeconomic disadvantage, racial and ethnic inequities, and gaps in health insurance coverage. Additionally, postpartum is a critical period with opportunity for intervention, with many preventable deaths occurring weeks to months after delivery. Collectively, these findings emphasize the need for comprehensive, equity-centered maternal health strategies in Arkansas, including improved cardiovascular screening, continuity of care beyond pregnancy, expansion of Medicaid coverage, and targeted public health interventions. Addressing these interconnected clinical and structural challenges is essential to reducing preventable maternal deaths and improving maternal health outcomes statewide.

Submitted by Claire Belvardi

Background: The geographic maldistribution of dermatologists results in significant access disparities, particularly among rural populations. National studies using county-level provider density and rurality metrics do not capture intra-county population distribution dynamics or the actual travel geographies patients navigate to receive care.

Objectives: To quantify U.S. dermatology access by integrating one-hour drive service areas (OHSAs) with fine-grained rural classification and determine the proportion of rural populations lacking timely access to dermatologic care.

Methods: We mapped the locations of 11,831 Medicare-participating dermatologists from the 2023 Medicare database. Using ArcGIS Pro, we generated OHSAs using existing road networks and speed limits. We overlaid Rural-Urban Commuting Area (RUCA) codes 4–10 to identify rural census tracts, and calculated the proportion of rural populations residing outside OHSAs.

Results: 38 states and the District of Columbia have total out-OHSA rates ≤10%. However, rural residence skews the distribution: 42 states have >50% of out-OHSA populations in RUCA-defined rural areas, and in 22 states >85% of out-OHSA residents are rural. Although the Atlantic Coast generally shows better rural access, New York, North Carolina, and New Hampshire each have >69% of rural out-OHSA populations. Some states with relatively large total out-OHSA populations (Wyoming, Montana, New Mexico) show nearly exclusively rural out-OHSA populations. Nationwide, 82.9% (9,480,993 individuals) of out-OHSA residents live in RUCA-defined rural areas.

Conclusions: Integrating OHSAs with RUCA codes offers a more precise analysis of rural dermatology access disparities. These findings highlight geographic areas where targeted interventions — such as rural clinic placement or teledermatology — could reduce access inequities.

Submitted by Clayton Frazier

Rethinking Anthropometrics: Phase Angle and Muscle Function Provide Distinct Insight Into Musculoskeletal Health

Shiloah Kviatkovsky Ph.D., Carsten Johnson B.S., Dylin White B.S., Landon Sandage B.S., Reagan Dodd MBA, London Parsons B.S, Noah Bogart B.S.

Background

Assessing protein status and muscle health are critical for aging and clinical populations and may inform fall risk, disease progression, surgical outcomes, and frailty. BMI remains the most standardized anthropometric used clinically, while measures such as percent body fat (PBF), skeletal muscle index (SMI), handgrip strength (HGS), muscle quality index (MQI), and phase angle (PhA) are increasingly used. PhA measured via upright bioelectrical impedance analysis (BIA) lacks established normative data in healthy adults. Bone mineral density (BMD) is also relevant to fall risk and surgical complications, yet limited data exist on its relationship to muscle health and strength in healthy populations.

Objective

Assess relationships among common anthropometrics, muscle function, and BMD in healthy adults.

Methods

Retrospective cross-sectional analysis of adults with upright BIA and DXA (N=282; DXA BMD n=199; HGS/MQI n=89; Age: 53.6 ± 16.1; Sex: Female=73%). Associations were screened with correlations. Primary models used multivariable linear regression with age (continuous) and sex as covariates; BMI was included where appropriate.

Results

Mean PhA was 5.27±0.78. In adjusted models, higher PhA was associated with higher SMI (β=0.397 per PhA unit; 95% CI 0.296–0.498; $p<0.001$) and lower percent body fat (PBF) (β=−3.023; 95% CI −4.682 to −1.364; $p<0.001$; adjusted for age/sex). Higher PhA was also associated with higher HGS (β=3.244 kg; 95% CI 0.764–5.724; p=0.011; adjusted for age/sex/BMI) and higher MQI (β=0.157; 95% CI 0.044–0.269; p=0.007; adjusted for age/sex/BMI). PhA was not independently associated with DXA BMD after adjustment (p=0.844). However, higher SMI (β=0.0511; p=0.010) and higher HGS (β=0.0068; p=0.008) were associated with higher BMD, while higher PBF was inversely associated with BMD (β=−0.0054; p=0.016).

Submitted by Carsten Johnson

Conclusions

In healthy adults, BMI showed limited association with muscle function and DXA BMD, whereas composition and function-based measures (SMI, PBF, HGS, MQI, and PhA) demonstrated stronger and more specific relationships with these outcomes. These findings support incorporating BIA and performance based measures alongside DXA where available rather than relying on BMI alone to improve clinical screening and risk stratification for low muscle health, functional decline, and potentially fall and surgery related risk in aging and at-risk populations**.**

Keywords: Phase angle, bioelectrical impedance, BMD, anthropometrics, muscle quality, MQI, hand grip strength

Submitted by Carsten Johnson

Abstract

Background: Mitochondria are key organelles for cellular homeostasis, and their dysfunction has been linked to multiple human diseases. Mitochondria further contain their own mtDNA and mtRNA in the mitochondrial matrix, which are crucial for regulating proper mitochondrial function. Importantly, mitochondrial-encoded RNA (mtRNA) forms highly dynamic mtRNA granules located within the mitochondrial matrix, which contain key mtRNA binding proteins. However, how mitochondrial function regulates mtRNA granule dynamics is still not well understood and has important implications for understanding the etiology of many human diseases associated with mitochondrial dysfunction.

Methods: We used Super-Resolution Lattice SIM2 live microscopy of mtRNA granule dynamics to investigate how mitochondrial function regulates the recruitment of mtRNA binding proteins to these granules. We further investigated how this pathway is modulated by additional protein interactors and the mechanistic role of RNA in regulating this pathway.

Results: We identified a novel pathway for mediating mtRNA granule crosstalk with cytoplasmic RNA granules. Using Super-Resolution Lattice SIM2 live microscopy, we show that a key mtRNA binding protein dynamically shuttles between mtRNA granules and cytoplasmic RNA granules. Interestingly, this pathway is dynamically regulated by mitochondrial function and interactions with protein binding partners. We further found that this process is regulated by RNA sequence length and structure. Functionally, oxidative signaling is sufficient to modulate this pathway, further highlighting this pathway in mitochondrial oxidative stress. Together, these findings identify a new mechanism for modulating mitochondrial health through mtRNA granule regulation.

Conclusion: This work identifies a new mechanism for cytoplasmic and mitochondrial RNA granule crosstalk, mediated by RNA regulation. These findings are critical for advancing our understanding of cellular homeostasis and may shed new light on the molecular pathways underlying major human disorders linked to mitochondrial defects.

Submitted by Catherine Molakal

Continuous Compartment Pressure Monitoring: A New Paradigm for Compartment Syndrome Surveillance in the ICU

Authors: Duru Erkan, BS[*]; Jack D. Sudduth, MD, MS[*]; Robert Whitford, MD[**]
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[**]University of Louisville, Department of Cardiovascular and Thoracic Surgery, Department of Emergency Medicine, Louisville, KY, USA.

Background:
Acute compartment syndrome (ACS) is a dreaded yet underrecognized complication of mechanical circulatory support (MCS).[1,2,3] Diagnosis of ACS relies on clinical examination, which may be unreliable in patients on MCS due to altered mental status and preserved distal pulses.[4,5,6,7]

Objectives:
To describe the use of continuous compartment pressure monitoring in patients on MCS with suspected ACS and evaluate its role in timely diagnosis and intervention when clinical findings are equivocal.

Methods:
We report four cases in which compartment pressure monitoring was used in patients on MCS. Cases include a 68-year-old male with cardiogenic shock requiring temporary right ventricular assist and venoarterial extracorporeal support who developed bilateral forearm ACS; a 59-year-old male post–ventricular pseudoaneurysm repair on venovenous extracorporeal support who developed left leg ACS despite distal perfusion strategies; a 61-year-old female with acute heart failure bridged to ventricular assist support who developed right forearm ACS suspected by intravenous line extravasation; and a 59-year-old male with acute respiratory distress syndrome on venovenous extracorporeal support who developed left forearm ACS despite patent vascular access.

Results:
All patients demonstrated sustained elevations in compartment pressures that directly informed the decision to proceed with emergent fasciotomy. Two patients achieved full functional recovery, one achieved limb salvage, and one expired unrelated to ACS or fasciotomy. No device-related complications were observed.

Conclusions:
These cases highlight limitations of clinical assessment alone in diagnosing ACS in critically ill patients on MCS. Continuous compartment pressure monitoring may serve as a valuable adjunct to improve diagnostic confidence, reduce delays to intervention, and support limb salvage.

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Submitted by Duru Erkan

Beyond the Skin: Maternal Whole-Health, Management, and Outcomes of Vitiligo during Pregnancy

Divya Purswani BA[1], Ashleigh Letterman BS[1], Scott Jackson MD[1], Shahrzad Bazargan-Hejazi PhD[1]

[1] Alice L. Walton School of Medicine, Bentonville, AR.

Background: Vitiligo is a complex autoimmune disease affecting roughly 0.5-2% of the global population, characterized by depigmented skin patches from selective melanocyte destruction. Although vitiligo does not directly cause mortality, it may signal systemic disease and bring a psychosocial burden that can significantly impact quality of life. Childhood and adult burden are well-documented, while pregnancy outcomes and safe treatments are limited. Since pregnancy alters immune function, further understanding of vitiligo on maternal and fetal health is needed.

Objective: To summarize evidence on vitiligo during pregnancy through a whole-health lens and identify gaps in current evidence.

Methods: A scoping review was conducted according to PRISMA-ScR guidelines. PubMed, Cochrane, and Embase were searched for peer-reviewed English-language published articles. Studies examining treatments, outcomes, wellbeing, or disease courses among pregnant women with vitiligo were included. Two reviewers independently screened manuscripts and extracted data was summarized in standardized tables.

Results: A total of 6 studies met inclusion criteria, spanning populations from the United States, Middle East, and Asia. Maternal vitiligo was associated with increased risk of adverse pregnancy outcomes such as spontaneous abortion, hypertensive disorders, and higher cesarean delivery rates. Findings were inconsistent, with some studies reporting no significant association and one suggesting reduced depigmentation during pregnancy. One study demonstrated increased autoimmune disorders in vitiligo-exposed offspring, including vitiligo, alopecia areata, and atopic dermatitis.

Conclusions: Literature examining vitiligo in pregnancy remains limited to a few observational studies investigating pregnancy outcomes. No studies comprehensively evaluated whole-health, psychosocial burden, or patient-centered outcomes, representing a critical gap future research should address for patient counseling.

Submitted by Divya Purswani

Title: Multidomain Preoperative Nutritional Risk in Total Joint Arthroplasty: High Prevalence and Overlapping Deficits in a Pilot Cohort

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Introduction: Sarcopenia and poor muscle quality are associated with worse functional outcomes and higher complication rates after total joint arthroplasty (TJA). Despite this, preoperative nutritional risk assessment in TJA often relies on limited metrics that may overlook deficits in nutritional status. Although several measures are used clinically, such as Onodera's Prognostic Nutritional Index (OPNI), Geriatric Nutritional Risk Index (GNRI), appendicular skeletal muscle mass (ASM), skeletal muscle index (SMI), ASM/BMI, and handgrip strength (HGS), there is no consensus on a standardized assessment approach for patients undergoing TJA.

Objective: Characterize the prevalence of nutritional risk across risk stratification domains and evaluate patterns of risk overlap among patients undergoing TJA.

Methods: In a prospective cross-sectional pilot study, patients (N=100; Age: 66.3±10.4 yrs; Male: 56%) undergoing hip, knee, or shoulder TJA were evaluated preoperatively via bioelectrical impedance (BIA) and hand dynamometry. Nutritional risk was classified using established cut points across the following domains: micronutrient status (Vit D, Zinc), protein/immune nutrition (OPNI, GNRI), function (HGS), and reserve (ASM, SMI, ASM/BMI). Prevalence of the highest-risk category for each measure and quantified multi-domain vulnerability were summarized by counting deficits across domains.

Results: High-risk classifications were common for OPNI=46.9%, Zinc=47.0%, and Vit D=42.3% (n=78). High-risk muscle reserve/function categories were less prevalent: HGS=15.0%, ASM=11.7%, ASM/BMI=14.0%, SMI=4.3%, and GNRI 4.3%. 76.1% had ≥1 deficit and 42.4% had ≥2 deficits.

Conclusion: Protein and micronutrient deficits were highly prevalent despite relatively preserved muscle reserve and function, underscoring the heterogeneity of preoperative nutritional risk and supporting the potential value of multidomain screening.

Submitted by Dylan White

Non-Invasive Hypoxia Detection in Circulating Exosomes

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[2]University of Arkansas for Medical Sciences, Department of Radiation Oncology

Hypoxia, a hallmark of most solid tumors, may be detectable via exosomes which are tiny vesicles shed from cells. In this study, we sought to utilize click chemistry methodology, which is a fast, specific chemical reaction that "clicks" two molecules together—typically an alkyne and an azide instead of the antibody-based detection methods. SCCVII and U118MG tumor cells grown under normoxic and hypoxic conditions were treated with Azidoazomycin arabinofuranoside (N3-AZA), a click-chemistry-compatible 2-nitroimidazole. Cells, as well as the exosomes isolated from the cell culture medium, were then subjected to click chemistry reaction using an alkyne dye (OG488) and analyzed by fluorescence measurement, western blotting, and flow cytometry.

Although in cells, the results show N3-AZA robustly labeled the hypoxic cells; no distinct bands were observed for exosome samples. The low exosome yield could have contributed to this result. Further studies will be conducted to optimize exosomes' count and medium conditions to achieve the detection of tumor hypoxia.

We proceeded to analyze exosomes in blood samples from tumor bearing mice that were treated with N3-AZA and found up to a 1.8 fold increase in hypoxic signal compared to non-tumor bearing mice.

Submitted by Emmanuela Beliard

Title: Mapping the longitudinal trajectory of skin pigmentation in critically ill neonates

Authors: Erinn Roblee[4], Simon Chung MS[2,3], Andrew W Brown PhD[2,3], Erinn Roblee[4], Sarah Diamond MD[1,2], Mario Schootman PhD[5,6], Peter M Mourani MD[7], Megha Sharma[1,2]

[1] Department of Pediatrics, UAMS, Little Rock, AR; [2]Arkansas Children's Research Institute, Little Rock, AR; [3]Department of Biostatistics, UAMS, Little Rock, AR; [4]College of Medicine, UAMS, Little Rock, AR; [5]Department of Medicine, UAMS, Little Rock, AR; [6]College of Nursing, UAMS, Little Rock, AR, [7]Department of Pediatrics, University of Michigan, Ann Arbor, MI

Background: Recent reports of pulse oximeter inaccuracy (POI) in patients with dark skin pigmentation highlight the need for objective measurement of skin pigmentation to quantify the magnitude of this inaccuracy. However, there are limited data on how best to assess skin pigmentation in neonates. No studies have longitudinally tracked skin pigmentation during infancy. Such data are essential for studies evaluating POI in neonates, as dynamic changes in skin maturation and pigmentation may influence device performance and should be considered when designing and refining pulse oximeter technology.

Methods: While focus of the parent prospective study is to quantify the extent of POI in neonates of diverse skin pigmentation, we are conducting an ancillary/nested study evaluating the longitudinal trajectory of skin pigmentation. Eligible infants are 0-3 months of age and have arterial lines in the NICU or CVICU. Skin pigmentation measures are obtained from enrollment to 6 months using a spectrophotometer at the pulse oximeter probe site (dorsal foot). This device reports comprehensive skin color metrics, including a Melanin Index (skin darkness), Erythema Index (redness), Individual typology angle, and the color coordinate L (skin lightness on a Black→White scale). We fit a linear mixed-effects model for these color metrics with gestational age, maternal race/ethnicity, and age as fixed effects. Age and its interactions with race/ethnicity were modeled using natural spline terms. A random intercept for each patient was included to account for within-subject correlation. Marginal predictions with 95% CI were calculated to visualize the trajectory of these skin color metrics across age, with corresponding skin tones rendered according to the L*C*h color space.

Results: To date, 172 of 200 planned neonates have been enrolled (156 analyzed), with 51 completing at least 4 weeks of follow-up for a total of 705 measurements. The cohort (Table 1) comprised 63% Non-Hispanic White, 28% Non-Hispanic Black; 62% male; and 34% preterm. Preliminary analyses show similar pigmentation at birth across race/ethnicity groups. Over time, Melanin Index remains elevated in NHB neonates, while it declines and plateaus in NHW neonates (Figure 1, 2).

Conclusions: This study provides the first longitudinal characterizations of skin pigmentation trajectories in critically ill infants. Pigmentation follows distinct courses in NHB and NHW neonates, with implications for evaluating the magnitude and clinical impact of POI. If pigment-related POI exists, its degree and consequences may vary across time points as pigmentation changes, in this vulnerable patient population.

Submitted by Erinn Roblee

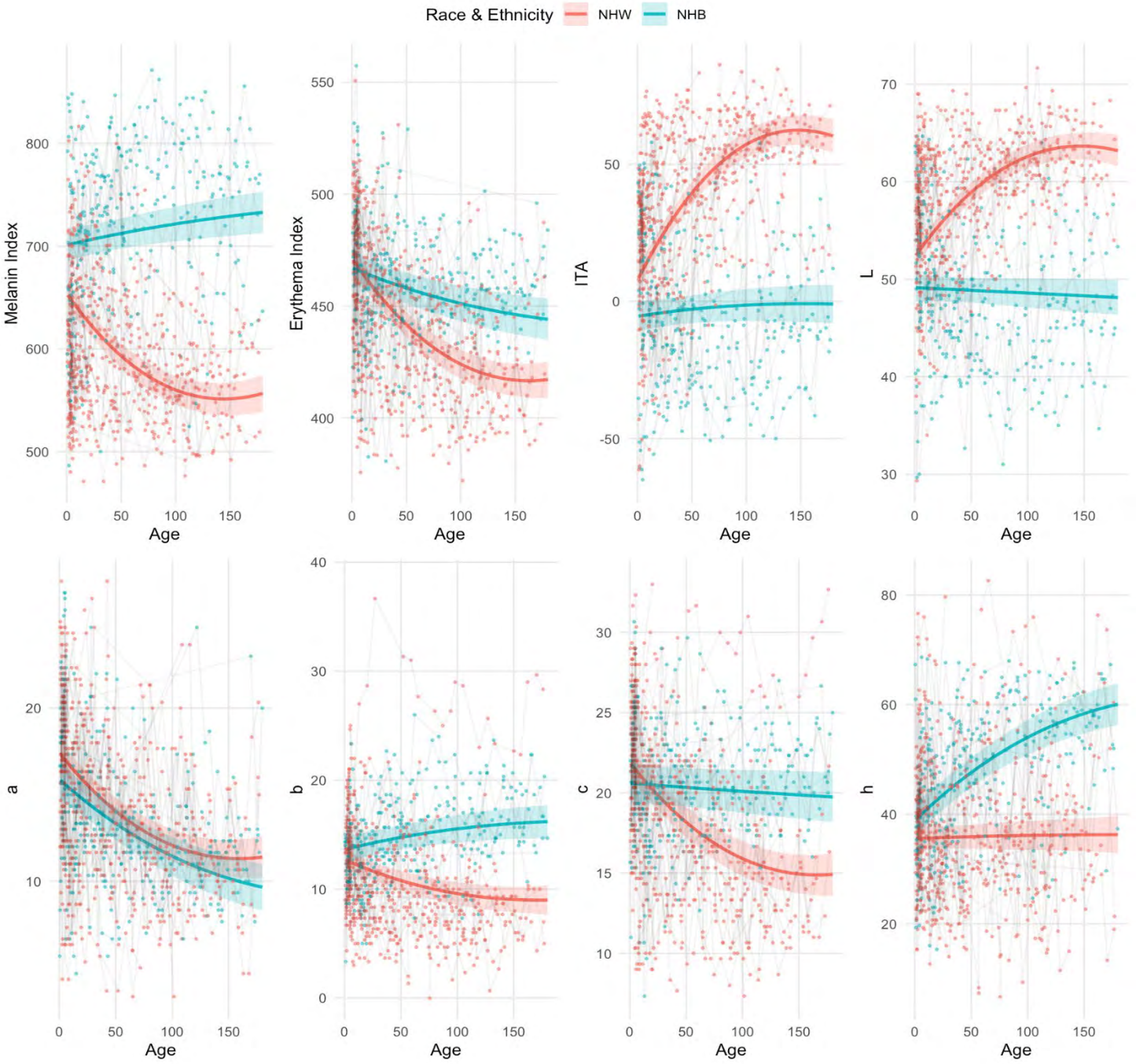
Table 1. Demographic characteristics of study cohort.

Characteristic	Overall N = 156[1]	Total N = 154			
		NHB N = 44[1]	NHW N = 97[1]	Hispanic N = 10[1]	Other N = 5[1]
Sex					
Female	59 (38%)	20 (45%)	36 (37%)	3 (30%)	0 (0%)
Male	97 (62%)	24 (55%)	61 (63%)	7 (70%)	5 (100%)
Birth Weight (kg)	2.33 (1.10)	1.88 (1.15)	2.52 (1.05)	2.47 (1.00)	2.33 (0.83)
Birth Weight category					
< 1500 g	44 (29%)	20 (47%)	21 (22%)	2 (20%)	1 (20%)
1500 - 2500 g	83 (54%)	14 (33%)	61 (64%)	5 (50%)	3 (60%)
> 2500 g	27 (18%)	9 (21%)	14 (15%)	3 (30%)	1 (20%)
GA (weeks)	33.91 (5.14)	31.71 (5.68)	34.69 (4.75)	35.53 (4.45)	34.80 (3.90)
GA category					
< 32 weeks	52 (33%)	24 (55%)	24 (25%)	3 (30%)	1 (20%)
32 - 37 weeks	61 (39%)	13 (30%)	42 (43%)	4 (40%)	2 (40%)
> 37 weeks	43 (28%)	7 (16%)	31 (32%)	3 (30%)	2 (40%)
Weight for GA					
SGA	16 (15%)	7 (21%)	8 (13%)	1 (11%)	0 (0%)
AGA	82 (75%)	23 (70%)	49 (77%)	7 (78%)	3 (100%)
LGA	11 (10%)	3 (9%)	7 (11%)	1 (11%)	0 (0%)
Unknown	47	11	33	1	2

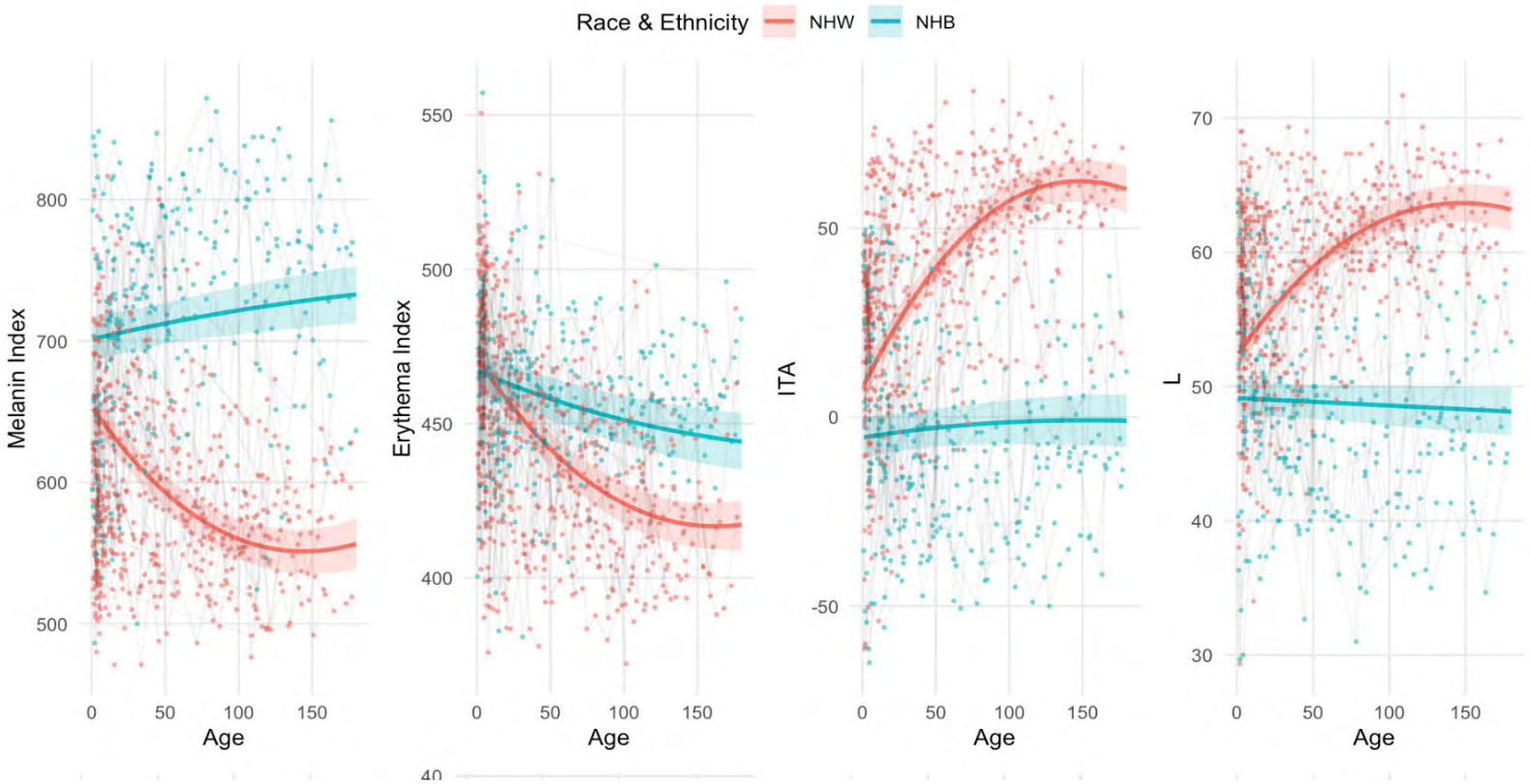
Abbreviation: NHB = Non-Hispanic Black, NHW = Non-Hispanic White, GA, gestational age, SGA = Small-for-gestational age, AGA = Appropriate-for-gestational age, LGA = Large-for-gestational age, 1 n (%); Mean (SD)

Submitted by Erinn Roblee

Figure 1. Plot depicting colorimetric measures reported by Spectrophotometer, SkinColorCatch, over serial weekly measurements on the Y-axis, with chronological age on the X-axis. Each dot represents a value of the colorimetric measure for a neonate. The solid line shows the marginal prediction from mixed-effects linear regression model, the shaded areas represent the 95% confidence intervals. Melanin Index and Erythema index are both reported on an arbitrary scale of 0-999, Individual Typology angle (ITA) is reported on a scale of -90° to +90°, L is reported on a scale of 0 (Black) -100 (White).

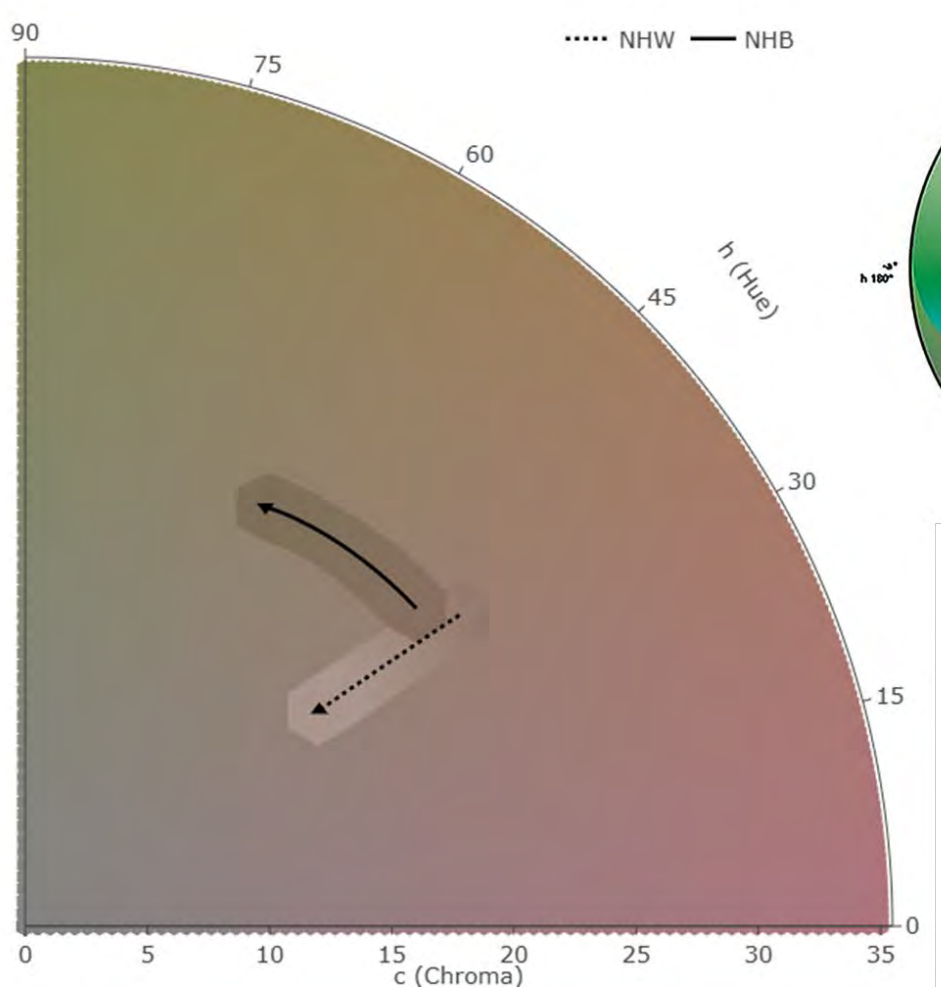


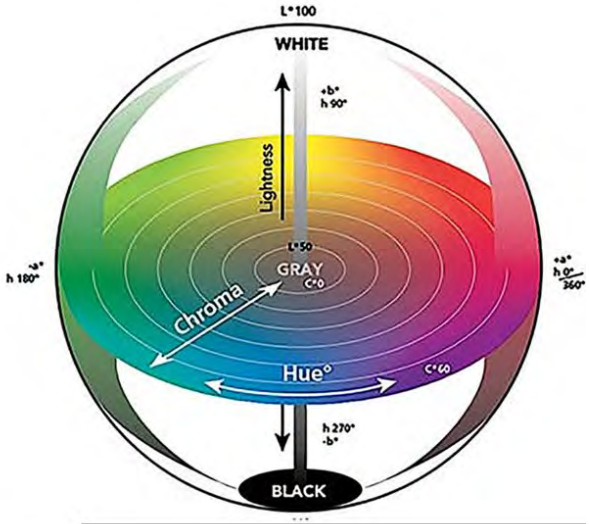
Submitted by Erinn Roblee



Submitted by Erinn Roblee

Figure 2. Visual representation of skin pigmentation change over time for NHB (solid arrow) and NHW (dotted arrow) infants. This plot reproduces skin color in 3-D space using colorimetric coordinates obtained from the spectrophotometer which captures a color's brightness (lightness, L), intensity or vividness (chroma, c) and the actual color eg, red, green, blue (hue, h). In the quadrant below, the hue (h) and chroma (c) are displayed in 2-D space as angle 0-90° and radius (0-35) respectively. Length of arrow from head to tail represents chronological age (0-180 days). The band around the two arrows captures the lightness (L) in addition to the h and c coordinates for the NHB and NHW groups.





Submitted by Erinn Roblee

Implementation and Evaluation of the Sun Protection Outreach Teaching by Students (SPOTS) Program in the Little Rock School District

Elizabeth Stevens, BS; Blakely Norris, BS
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Background

Ultraviolet radiation exposure is a major risk factor for photoaging and skin cancer, including melanoma. Childhood and adolescence are critical periods for establishing sun protection behaviors that influence lifelong risk. Sun Protection Outreach Teaching by Students (SPOTS) provides structured educational modules designed to improve sun safety awareness among school-aged children. Early implementation of sun safety education may improve knowledge and promote preventative behaviors in pediatric populations.

Objectives

To implement the SPOTS educational module in elementary and high school settings and evaluate its effectiveness in improving student knowledge of sun safety and skin cancer recognition using pre- and post-instruction assessments.

Methods

A standardized SPOTS educational module consisting of slides, videos, and interactive activities was delivered to students in the Little Rock school district. High school students received a 90-minute session, and elementary students (4^{th} and 5^{th} grade) received a condensed 20-minute session. All students completed an identical 10-question quiz immediately before and after instruction. Quiz performance was analyzed to assess changes in knowledge.

Results

To date, the module has been implemented in one high school classroom (n=21). Preliminary analysis demonstrated improved performance, with incorrect responses decreasing from 40% on the pre-instruction quiz to 10% on the post-instruction quiz. Final analysis including all seven cohorts is ongoing and will be completed prior to presentation.

Conclusions

Baseline sun safety knowledge among students appears limited. Structured educational interventions such as SPOTS may improve awareness and represent a practical strategy for early skin cancer prevention, supporting broader public health prevention efforts.

Submitted by Elizabeth Stevens

Pediatric and Adolescent Skin Conditions Across Skin Tones

Elizabeth Stevens, Mark Johsnon, Erica Malone Ph.D.

Background:
During preclinical medical education and dedicated USMLE Step 1 preparation, the authors observed a persistent lack of dermatologic teaching materials depicting skin conditions across diverse skin tones. Most resources emphasize Fitzpatrick skin types I–III, limiting exposure to how common pediatric and adolescent dermatologic conditions present and respond to treatment in darker pigmentation.

Objective:
To develop a comparative, image-based educational resource illustrating the presentation and management of common pediatric and adolescent skin conditions across skin tones using the Fitzpatrick Scale.

Methods:
A curated collection of clinical images, descriptive features, and treatment considerations was developed for five common pediatric and adolescent conditions: atopic dermatitis, infantile hemangiomas, herpes simplex virus, acne vulgaris, and tinea versicolor. Images were sourced from the AAD and DermNet. Targeted literature reviews were conducted for each condition, emphasizing variations in clinical appearance, therapeutic response, and risk of complications across Fitzpatrick skin types. The Fitzpatrick scale was used as a standardized reference point.

Results:
Notable differences were observed in lesion morphology, erythema visibility, and potential complication across skin tones. Treatment considerations also varied. Adjustments in topical potency, duration of therapy, and counseling regarding pigmentary outcomes were often necessary.

Conclusion:
This resource emphasizes the importance of inclusive dermatologic education that integrates both diagnostic and therapeutic considerations across skin tones. By highlighting differences in presentation and treatment response, this work aims to support more accurate diagnosis, optimized management, and equitable pediatric and adolescent dermatologic care.

Submitted by Elizabeth Stevens

Title:
A Real-Time Beighton Scoring (RTBS) Computer Application for Hypermobility Assessment for Patients with Ehlers-Danlos Syndrome and Hypermobility Spectrum Disorder: An Early Prototype

Authors:
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Institution:
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[2]New York Institute of Technology College of Osteopathic Medicine at Old Westbury

Background:
Ehlers-Danlos Syndrome (EDS) and Hypermobility Spectrum Disorder (HSD) are hereditary connective tissue disorders characterized by joint hypermobility and tissue fragility. Diagnosis relies on physical examination including a Beighton score–a nine-point system used to assess thumb, pinkie, elbow, knee, and spine joint hypermobility. This scoring system is a clinician-observed assessment that may rely on subjective visual estimation or objectively quantified using a goniometer. However, manual evaluation is time-dependent and susceptible to observer variability. With increasing utilization of telemedicine, virtual assessment remains challenging. This highlights the need for rapid, objective, and automated tools capable of supporting remote clinical evaluation.

Objective:
To develop a computer application prototype that populates a Beighton score in virtual evaluation of EDS and HSD in real-time.

Methods:
The application was built using PyCharm version 21.0.6 and Python 3.11. This application utilizes real-time computer visual assessment through MediaPipe, Math, and OpenCV, to detect joint landmarks and angles using the computer's webcam and automate a Beighton score.

Results:
Initial testing demonstrates consistent identification of joint landmarks and automated angle measurements required to obtain a Beighton score, including bilateral pinkies, elbows, and knees. This prototype also features preliminary testing of thumb mobility and spinal curvature.

Submitted by Fah Sysavanh

Conclusions:
This RTBS computer application, under continuous development, demonstrates the potential for automating hypermobility assessment in an objective fashion. Further development is needed to rapidly assess all nine joints, include mobile device integration, and incorporate compensatory movement detection, so clinicians can objectively assess Beighton's score in hypermobile patients virtually.

Submitted by Fah Sysavanh

Transfusing Trauma Patient Transfers in a Rural State: An Analysis of a State Trauma Registry from 2016 to 2022.

Authors: Garrett R. Darden, Kyle J. Kalkwarf MD, Austin Porter DrPH, Jeff Tabor, Stephen Bowman PhD, Charles Mabry MD & Richard Betzold MD

Abstract: This study examined blood transfusions among injured patients transferred from rural hospitals to higher-level facilities (2016-2022). Transfer patients who presented with hypotension or abdominal/thoracic AIS ≥3 were included. Transfusions were categorized as sending hospital only (SHO), receiving hospital only (RHO), both, or neither, and each group was compared with respect to systolic blood pressure, Injury Severity Score (ISS), and ED Length of Stay. Of the 634 patients, 25.7% received blood only after transfer (RHO) and 7.8% received blood only before transfer (SHO). Group RHO's hypotension rate and average ISS increased by 59.5% and 9.3 points, respectively, after transfer, compared to Group SHO's increases of only 27.9% and 5.2 points. These findings suggest inconsistent transfusion practices in rural centers and highlight opportunities to improve early recognition and treatment of hypotension and reduce disparities in access to blood products.

Submitted by Garrett Darden

IMPACT OF PRE-EXISTING PSYCHIATRIC DISORDERS ON CLINICAL OUTCOMES IN TAKOTSUBO CARDIOMYOPATHY

Gunner Gilbert, Praneeth Ulavala, Aselin Puthenpurail, Jillian Hackney, Andrew Moore, Byron Marciniak, Samantha Robinson, Srikanth Vallurupalli, Hanna Jensen

Abstract

Background: Takotsubo cardiomyopathy (TTC) is an acute, reversible form of heart failure often triggered by emotional or physical stress. Psychiatric comorbidities are common among TTC patients, but their influence on clinical outcomes remains unclear.

Objective: This study seeks to evaluate the association between pre-existing psychiatric disorders and clinical outcomes in patients with TTC.

Methods: We conducted a retrospective cohort study of 641 patients diagnosed with TTC. Patients were stratified by presence or absence of pre-existing psychiatric illness, defined by diagnosis or psychiatric medication use. Demographic data, substance use history, InterTAK scores, and a range of clinical outcomes, both in-hospital and post-discharge, were compared between groups.

Results: Of the 641 patients, 422 (65.8%) had a history of psychiatric illness. This group was younger, more often female, and had higher InterTAK scores. They also experienced a longer hospital stay ($p<0.05$). No significant differences were observed in ICU admissions, in-hospital cardiac arrest, intubation, or left ventricular dysfunction. One-month mortality was lower in the psychiatric cohort, though this group had higher, but not statistically significant, rates of readmission and was more frequently lost to follow-up. Long-term outcomes, including mortality and recurrence, trended more favorable but did not reach statistical significance.

Conclusion: In this study, we found that pre-existing psychiatric illness is common among patients with TTC and is associated with longer hospital stays and distinct clinical characteristics. However, psychiatric comorbidity did not independently worsen in-hospital complications or long-term cardiovascular outcomes. These findings underscore the importance of multidisciplinary care that integrates psychiatric and cardiologic management.

Submitted by Gunner Gilbert

Title: Preparing Rural Hospitals for Obstetric Emergencies in the United States

Background:

Widespread closure of rural hospital obstetric units has reduced access to maternity care in the United States, exacerbating disparities between rural and urban populations. Maternal mortality rates in rural communities are nearly double those in urban areas. As geographic access continues to decline, rural hospitals without obstetric services must be prepared to manage obstetric emergencies in resource-limited settings.

Objectives:

To identify effective strategies that rural hospitals can implement to respond to obstetric emergencies in the United States.

Methods:

A structured review of literature published over the past two decades, including studies focused on obstetric access in rural communities, emergency preparedness and quality improvement initiatives. Articles were analyzed for themes related to geographic access, hospital delivery volume, maternal outcomes, training effectiveness and workplace challenges.

Results:

Rural hospitals face staffing shortages, low delivery volumes, financial constraints and long travel distances, all of which negatively impact maternal outcomes. Most rural hospitals without obstetric units are equipped to perform blood transfusion and neonatal resuscitation, however few have surgical capability or policies implemented for emergency cesarean deliveries. Effective strategies include readiness assessments, standardized emergency protocols, simulation-based clinician training and investment in quality improvement initiatives.

Conclusions:

Systemic readiness assessments, standardized protocols and simulation-based clinician training can strengthen rural hospitals for obstetric emergencies. These strategies may help reduce disparities and mitigate maternal morbidity and mortality in rural communities. Investment in rural hospitals and populations is essential to addressing geographic inequities in maternal health outcomes.

Submitted by Grace Tidwell

Title: Risk Beyond Relationships: Intimate Partner Violence and Rates of Sexually Transmitted Infections in Adolescents

Background
Intimate partner violence (IPV)—aggression or abuse within a romantic relationship—is common in adolescents and young adults, with nearly 41% of women and 26% of men experiencing it in their lifetime. While prior research demonstrates that adults who experience IPV have higher rates of sexually transmitted infections (STIs), including HIV, this association is poorly studied in adolescents. We sought to explore the associations between IPV and STIs in adolescents and young adults aged 11 to 25 years using a large, multi-institutional dataset.

Methods
We conducted a retrospective cross-sectional analysis using the Epic Cosmos electronic health record database. We identified patients (aged 11–25) with documented screening for IPV (emotional, fear, physical, or sexual) between August 2020 and July 2025. Patients were grouped by exposure status: IPV+ (reported experiencing IPV) and IPV– (reported no IPV exposure). Outcome measures included diagnoses of gonorrhea, chlamydia, trichomoniasis, syphilis, and HIV. We calculated odds ratios (ORs) to assess the likelihood of STI diagnosis in the IPV+ group compared to the IPV– group.

Results
A total of 1,266,479 patients had documented IPV screening, with 41,416 (3.3%) reporting at least one type of IPV exposure. We found significant odds ratios for the association between each category of IPV (emotional, fear, physical, and sexual) and each STI outcome. Across all models, IPV exposure was associated with significantly higher odds of STI diagnosis (e.g., ORs ranged from 2.01 to 4.19).

Conclusion
In this large cohort of adolescents and young adults, all categories of IPV were significantly associated with increased odds of STIs compared to those who had not experienced IPV. These findings underscore the importance of routine IPV screening in adolescent care and the need for integrating targeted STI prevention and treatment strategies for at-risk adolescents and young adults.

Table 1: Demographic Data

Number of Patients	# IPV+	% IPV+	# IPV-	% IPV-
Race (if disclosed, more than one may be selected)				
White	28886	69.7	812506	66.3
Black or African American	9771	24.0	251223	20.5
Other	6469	15.6	211026	17.2
Asian	1029	2.5	45508	3.7
American Indian	906	2.2	16598	1.4
Native Hawaiian	301	0.7	7819	0.6
None of the Above	1287	3.1	54158	4.4
Ethnicity (if reported)				
Not Hispanic or Latino	32009	77.3	879,766	71.8

Submitted by Grace Turbyfilll

Hispanic or Latino	6367	15.3	264,733	21.6
Not disclosed	3040	7.3	80564	6.6
Gender				
Female	15482	37.4	378798	30.9
Male	3192	7.7	136809	11.1
Transgender male	335	0.8	4567	3.7
Transgender female	231	0.6	2550	0.2
Non-Binary	66	0.2	653	0.05
Not Disclosed	22110	53.4	701686	57.3

Table 2: Likelihood of Sexually Transmitted Infection

	Odds Ratio	99% CI	P-value
(vs. – Emotional IPV)			
+ Emotional IPV/+Gonorrhea	2.59	2.37 – 2.83	<0.01
+ Emotional IPV/+Chlamydia	2.16	2.05 – 2.27	<0.01
+ Emotional IPV/+Trichomoniasis	2.58	2.06 – 3.24	<0.01
+ Emotional IPV/+Syphilis	2.43	2.04 – 2.89	<0.01
+ Emotional IPV/+HIV	2.30	1.86 – 2.83	<0.01
(vs. – Fear IPV)			
+ Fear IPV/+Gonorrhea	2.68	2.41 – 2.97	<0.01
+ Fear IPV/+Chlamydia	2.10	1.97 – 2.23	<0.01
+ Fear IPV/+Trichomoniasis	2.99	2.32 – 3.87	<0.01
+ Fear IPV/+Syphilis	2.61	2.13 – 3.19	<0.01
+ Fear IPV/+HIV	2.42	1.89 – 3.09	<0.01
(vs. – Physical IPV)			
+ Physical IPV/+Gonorrhea	3.72	3.34 – 3.35	<0.01
+ Physical IPV/+Chlamydia	2.72	2.54 – 2.90	<0.01
+ Physical IPV/+Trichomoniasis	4.19	3.22 – 5.45	<0.01

Submitted by Grace Turbyfilll

+ Physical IPV/+Syphilis	3.63	2.95 – 4.47	<0.01
+ Physical IPV/+HIV	2.95	2.26 – 3.87	<0.01
(vs. – Sexual IPV)			
+ Sexual IPV/+Gonorrhea	2.16	1.80 – 2.59	<0.01
+ Sexual IPV/+Chlamydia	2.01	1.82 – 2.22	<0.01
+ Sexual IPV/+Trichomoniasis	2.45	1.66 – 3.95	<0.01
+ Sexual IPV/+Syphilis	2.93	2.17 – 3.96	<0.01
+ Sexual IPV/+HIV	2.75	1.91 – 3.96	<0.01
(vs. – Any IPV)			
+ Any IPV/+Gonorrhea	2.56	2.36 – 2.77	<0.01
+ Any IPV/+Chlamydia	2.10	2.01 – 2.20	<0.01
+ Any IPV/+Trichomoniasis	2.58	2.11 – 3.17	<0.01
+ Any IPV/+Syphilis	2.46	2.11 – 2.87	<0.01
+ Any IPV/+HIV	2.16	1.78 – 2.62	<0.01

Submitted by Grace Turbyfilll

Intermittent Maple Syrup Urine Disease in a 13-month-old

Hannah Krehbiel, Katie Beaton M.D., Charles Glasier M.D., Aixa Gonzalez M.D.

Case and Discussion

A 13-month-old male presented with vomiting, lethargy, and intermittent episodes of ataxia which began as he transitioned from breast milk to cow's milk. The patient had no pertinent birth or medical history, a normal newborn screen, and was up to date on vaccines. Initial workup found significant anion gap metabolic acidosis. Head CT showed diffuse, abnormal deep white matter hypodensity involving the bilateral thalami, basal ganglia, and brainstem and diffuse cerebral edema. Stat MRI was obtained, genetics was consulted, and the patient was ultimately admitted to the PICU following new-onset seizures. Marked elevations in both plasma amino acids and urine organic acids (Table 1) supported a diagnosis of maple syrup urine disease (MSUD). Further genetic testing showed that the patient carries two pathogenic variants *in trans* in the DBT gene, one of which is known to have residual enzyme activity close to 14%. This finding is diagnostic for intermittent MSUD.

MSUD is caused by a deficiency of branched-chain alpha-ketoacid dehydrogenase complex (BCKDC), an enzyme involved in the breakdown of the branched chain amino acids (BCAAs) leucine, isoleucine, and valine. BCKDC deficiency causes BCAAs and their corresponding ketoacids to build up in the plasma. This can cause neurotoxicity, psychomotor delay, feeding issues, and a maple-syrup-like odor of the urine. While classic MSUD typically presents in neonates and is identifiable on newborn screen, intermittent MSUD with residual enzyme activity is easy to miss and should be kept on the differential for patients who present with encephalopathy and metabolic derangements.

Table 1: Initial Plasma Amino Acids and Urine Organic Acids

Plasma Amino Acids	**Value (umol/L)**
Alloisoleucine	155 (reference range <1)
Isoleucine	687 (reference range 31-86)
Leucine	1670 (reference range 47-155)
Valine	1422 (reference range 64-294)
Urine Organic Acids	**Value (mmol/mCr)**
2-Ketoisovaleric Acid	>250 (reference range 0-4)
2-Keto-3-methylvaleric Acid	>501 (reference range 0-10)
2-Ketoisocaproic Acid	>250 (reference range 0-4)

Submitted by Hannah Krehbiel

Adverse Childhood Experiences and the Development of Endometriosis: A Scoping Review

Authors:

Paige Diamond[1]

Ashleigh Lacey[1]

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Background

Endometriosis is a chronic gynecologic disorder affecting approximately 6–10% of reproductive-age women worldwide and is associated with pelvic pain, dysmenorrhea, infertility, and reduced quality of life. Although hormonal, genetic, and environmental factors contribute to its pathogenesis, the etiology remains incompletely understood. Emerging evidence suggests that exposure to adverse childhood experiences (ACEs) may alter inflammatory and neuroendocrine pathways, potentially increasing susceptibility to endometriosis.

Objective

To map and characterize the existing literature, examine the association between ACEs and endometriosis.

Methods

This scoping review followed PRISMA-ScR guidelines. PubMed and Embase were searched using controlled vocabulary (MeSH/Emtree terms) and keywords related to childhood adversity and endometriosis for studies published from 2001 through 2025.

Eligibility criteria included participants with a clinical or surgical diagnosis of endometriosis; assessment of ACE exposure before age 18; and peer-reviewed,

Submitted by Hannah Matthews Crum

Two independent reviewers conducted title/abstract and full-text screening. Study design, population characteristics, ACE measurements, endometriosis assessment, and reported associations were synthesized descriptively.

Results

After duplicate removal, 81 records were identified, with 16 meeting inclusion criteria. Most included studies were observational and used standardized questionnaires.

Across studies, women reporting one or more ACEs had higher odds of endometriosis compared to those without exposure, with several demonstrating graded associations. Effect sizes varied, and heterogeneity was noted in ACE definitions and diagnostic confirmation. Data synthesis remains ongoing.

Conclusions

Current evidence indicates a possible association between ACEs and endometriosis, though findings are limited by observational design and methodological variability. Prospective studies are needed to clarify temporality and underlying mechanisms.

Submitted by Hannah Matthews Crum

A Cadaveric Discovery of Vascular Abnormality and Disease: Abdominal Aortic Aneurysm and Retro-aortic Left Renal Vein

Authors: Phelan, Matthew, Pocsi, Anna J., Rahal, Alex A., Rana, Haris, Ranganath, Rahul

Background: Heart disease accounts for 23.6% of all deaths in Arkansas. Atherosclerosis weakens large arterial walls via matrix degradation and chronic inflammation, causing vessel dilation, aneurysm formation, luminal narrowing, ischemia, and potential myocardial infarction. Abdominal aortic aneurysms (AAA; >3.0 cm or 50% enlargement) are linked to heart disease. Lying posterior to the abdominal aorta, a retro-aortic left renal vein raises nutcracker syndrome risk. AAA incidence rises after age 55 with hypertension and smoking.

Objectives: This study examined histological and gross findings in a cadaver to analyze risk factors and determine the cause of death.

Methods: Over 8 weeks, histological samples from the right lung, right kidney, superior mediastinal lymph nodes, and left ventricle of a male cadaver aged 70-80 years were collected and stained.

Results: The 5’10”-6’2”, 220-240 lb donor had a reported cause of death of congestive heart failure. A 33 mm fusiform AAA with calcification was present. The heart weighed 658 g, contained a pacemaker, and showed ventricular wall thicknesses of 25 mm (left) and 15 mm (right). Histology revealed remote myocardial infarction and multinucleation. A retro-aortic left renal vein showed no renal pathology. Enlarged lymph nodes, lungs, and kidneys displayed increased plasma cells. Other findings included acute airway inflammation, hyaline membranes, and absence of hemosiderin-laden macrophages.

Conclusions: The findings support congestive heart failure as the cause of death. Cardiac enlargement, pacemaker presence, prior infarction, and myocardial remodeling indicate long-standing ischemic heart disease. These results support further research into systemic contributors to cardiac disease.

Submitted by Haris Rana

Severe Mucositis and Rash in a Patient with Prophylaxis Methotrexate for Post-Molar Gestational Trophoblastic Neoplasia: A Case Report for Management with Corticosteroids and Leucovorin Rescue

Authors: Halston Tran, OMS-III, BS[1]; Vaidehi Patel, OMS-III, MS[1]; Ravallika P. Konda, MD[2]
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Introduction

Methotrexate (MTX) is standard first-line chemotherapy for low-risk gestational trophoblastic neoplasia (GTN), with remission rates of 54.4–85%. Although generally well-tolerated, severe mucocutaneous toxicity can develop rapidly. Hypoalbuminemia increases unbound drug levels and tissue penetration, amplifying toxicity risk. We present a case of rapid recognition and management of severe MTX-induced toxicity.

Clinical Presentation

A 26-year-old female with complete molar pregnancy (beta-hCG 1,000,000mIU/mL) presented with acute-onset diffuse pruritic vesicular rash, grade 4 oral mucositis, severe odynophagia, and inability to tolerate oral intake. Baseline albumin 3.1g/dL. Vital signs stable. Consultations and negative blood cultures excluded alternative etiologies. MTX-induced mucocutaneous toxicity diagnosed based on temporal relationship and classic triad.

Outcome

MTX discontinued immediately. Intravenous leucovorin rescue, corticosteroids, acyclovir, and fluconazole initiated. Within 24 hours, marked improvement noted. By hospital day 4, complete symptomatic resolution achieved with tolerating regular diet and afebrile status. Discharge labs: WBC 2.8×10^9/L, platelets 129×10^9/L, hemoglobin 10.8g/dL, renal function preserved. Discharged in stable condition with close outpatient monitoring and methotrexate documented as drug allergy.

Discussion

Severe MTX-induced toxicity, though rare, develops rapidly in low-risk GTN. Prompt identification of the classic triad and immediate MTX withdrawal with leucovorin or corticosteroids typically leads to rapid improvement within 24 hours, unlike SJS/TEN. Baseline hypoalbuminemia amplified toxicity and represents an underrecognized pre-treatment risk factor. For MTX-intolerant patients, actinomycin D offers superior remission rates (72.8% vs. 54.4%, p=0.0038).

Conclusion

Early recognition and prompt aggressive rescue therapy with leucovorin and corticosteroids yields rapid improvement. Baseline hypoalbuminemia screening before MTX initiation is warranted. Actinomycin D is a superior alternative for MTX-intolerant patients.

Submitted by Halston Tran

Title: "Does HPSP Reduce Degree-Based Disparities? A Scoping Review of DO vs MD Match Outcomes in Competitive Military Residencies"

Authors: June Dunwald B.S., OMS-III[1]; Halston Tran B.S., OMS-III[1]; Eva Wilk B.S., OMS-III[1]; Michael Strieby B.S., OMS-III[1]; Amanda Deel, D.O.[1]

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Background

Osteopathic physicians comprise a growing share of Health Professions Scholarship Program (HPSP) recipients and military medical trainees. In civilian graduate medical education (GME), DO applicants match at significantly lower rates than MD applicants in competitive specialties. Military GME operates through a centralized Joint Services Graduate Medical Education Selection Board (JSGMESB), yet whether this system mitigates or reproduces civilian DO disadvantages remains unknown.

Objective

To systematically map the existing literature on DO versus MD match outcomes in competitive military specialties and identify critical evidence gaps.

Methods

Scoping review following JBI methodology with semantic search resulted in 500 academic papers across 138 million sources. PubMed, Google Scholar, and military medical repositories were searched using terms related to military residency match, HPSP, and DO/MD outcomes. Full-text screening of 168 sources identified 70 relevant studies addressing military GME, DO/MD training comparisons, or competitive specialty matching.

Results

Of 70 included sources, only three examined degree-stratified outcomes in military GME. One Army general surgery study reported DO match rates of 9% versus 91% for MDs ($p=0.026$), while surveys of Army orthopedic program directors and Navy HPSP residents found no perceived degree-based bias. In contrast, civilian literature consistently documented DO match-rate disadvantages of 15–40% in many competitive specialties.

Conclusions

This scoping review finds that while more osteopathic physicians are entering military medicine, there is little empirical data comparing DO and MD match outcomes, despite extensive civilian research. Greater transparency in JSGMESB reporting and degree-stratified outcome tracking is needed to inform advising, workforce planning, and equitable access to competitive military residencies.

Submitted by June Dunwald

Closing the Bone Health Gap in Arthroplasty: Preoperative DXA Screening

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Introduction: Low bone mineral density (BMD) is common in older adults and may be under-recognized in patients undergoing total joint arthroplasty (TJA). Although many TJA candidates meet criteria for osteoporosis screening with dual-energy X-ray absorptiometry (DXA), screening rates remain low. Unrecognized osteopenia/osteoporosis at surgery may increase risk of intraoperative and postoperative complications.

Objectives: To determine the prevalence of osteopenia/osteoporosis diagnoses and preoperative DXA screening in a University of Arkansas for Medical Sciences (UAMS) TJA cohort and to assess rates of preoperative DXA screening among complication/revision cases.

Methods: This retrospective cohort study included adults undergoing elective primary hip, knee, or shoulder TJA at UAMS over a 3-year period. BMD disorders were identified using ICD-10 codes for osteoporosis and osteopenia (M80, M85). Preoperative DXA screening was defined as a documented DXA within 2 years prior to TJA. Available lumbar spine, femoral neck, and total hip T-scores were abstracted. Descriptive statistics summarized patient characteristics, BMD disorder prevalence, and DXA screening frequency. Associations between DXA diagnosis and postoperative complications were assessed using cross-tabulations and Fisher's exact testing.

Results: DXA screening was uncommon among patients with postoperative complications (2/87) and absent among revision cases (0/66). Among patients with documented DXA diagnosis (n = 119; 5.4%), complications were rare (2/119), occurring as pain in the osteoporosis group (1/31) and infection in the osteopenia group (1/51).

Conclusion: Preoperative DXA screening was markedly underutilized, limiting assessment of preoperative risk. Screening pathways may improve diagnosis of BMD disorders and inform surgical planning and bone health optimization prior to surgery.

Submitted by Jayden Goff

Novel Non-Cytochrome P450-Mediated Drug Dehalogenation Pathway

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BACKGROUND: Approximately 25% of current pharmaceuticals and 30% of drugs in development are halogenated. The incorporation of halogens into drugs typically improves its pharmacokinetic properties. These favorable drug properties are undone by metabolic dehalogenation. The most well-studied dehalogenation pathway involves oxidation by microsomal Cytochrome P450s (CYP). Those reactions require NADPH; however, studies by our group and others indicated defluorination was possible in the absence of NADPH. Subsequent studies showed this reaction to be hydrolytic. We hypothesized that microsomal halo-hydrolysis is a novel, uncharacterized metabolic pathway contributing to the clearance of clinically relevant drugs.

OBJECTIVES: Determine the reaction kinetics of the novel dehalogenation pathway with model halogenated drugs.

METHODS: As a model fluorinated drug, we characterized the reaction kinetics for the hydrolytic defluorination of 5F-APINACA using liver microsomes from humans and rodents. Initial control experiments explored conditions driving the reaction followed by quantitative steady-state studies. We also explored the impact of structural differences among synthetic cannabinoid substrates on the hydrolytic reaction.

RESULTS: Initial studies with human liver microsomes demonstrated hydrolytic defluorination exhibited properties of an enzyme-driven process. The microsomal activity toward 5F-APINACA could be heat-inactivated and was linear as a function of time and protein concentration but saturable at high substrate concentrations. Steady-state kinetic data were fit to the Michaelis-Menten model yielding Vmax 96 pmol/min/mg protein and Km 2.7 μM.

CONCLUSIONS: We report the first kinetics for hydrolytic defluorination of 5F-APINACA. The kinetic parameters were comparable to those reported for CYPs, indicating the potential clinical relevance of this reaction.

Submitted by Jed Johnson

Current Postpartum Depression Screening Practices of Relevant Post-Natal Care Specialists for Mothers with Premature Infants: A Scoping Review

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Background:

Mothers of premature infants have increased risk of postpartum depression (PPD), with studies showing a 40% increase in PPD in comparison to mothers of term infants[1]. A preliminary literature search identified no existing reviews addressing PPD screening practices between post-natal care specialists for mothers of preterm infants. This highlights the need for comprehensive synthesis of current practices to inform clinical guidelines and health policy.

Objectives:

To review current PPD screening practices among relevant post-natal care specialists for mothers of premature infants including screening frequency, provider type administering screenings and screening instruments used. Additionally, comparing geographic settings and identifying barriers of PPD detection.

Methods:

PubMed, MEDLINE via Ovid, CINAHL Ultimate, ProQuest Central, Scopus, and Google Scholar (for grey literature) were searched from inception until February 2026. Hand searching of relevant articles was performed. The articles selected were screened for the inclusion and exclusion criteria then synthesized and critically evaluated by the researchers for PPD screening practices in outpatient postpartum follow-up care.

Results:

Preliminary themes suggest mothers of premature infants have increased contact with healthcare providers. Pediatricians likely will have the highest number of PPD screenings performed compared to other providers. Gaps in data for rural communities are likely with less literature regarding this community type.

Conclusions:

Further directions include comparing screening tools' efficacy, determining average time to identify PPD symptoms from onset and consideration for updated PPD screening guidelines within this population. Limitations to our study include focusing on a low-risk age group from 18-34 years old.

Submitted by Julia Neiswander

Citations:

1. Brady, S., Steinwurtzel, R., Kim, R., Abascal, E., Lane, M., & Brachio, S. (2023, July 10). *Improving postpartum depression screening in the NICU: Partnering with students to improve outreach*. Pediatric quality & safety. https://pmc.ncbi.nlm.nih.gov/articles/PMC10332827/

Submitted by Julia Neiswander

Pediatric Cervical Fusion: A Retrospective Analysis of Incidence and Complications - A Decade in Review

Schneck, Rainwater, Landrum, Bumpass

Background:
Pediatric cervical fusion is rare, and limited data exist regarding indications and postoperative outcomes compared with adults.

Objectives:
To compare indications and 90-day postoperative complications and readmissions among pediatric patients undergoing anterior cervical discectomy and fusion (ACDF) versus posterior cervical fusion (PCF), stratified by single- and multilevel procedures.

Methods:
A national claims database identified patients <18 years undergoing ACDF (n=309) or PCF (n=872). Demographics, comorbidities, and 90-day complications and readmissions were analyzed. Chi-square and t-tests were performed (α=0.05).

Results:
A total of 1,181 pediatric cervical fusions were identified. Multilevel ACDF patients had higher comorbidity burden and diabetes prevalence. Multilevel PCF patients were older and had higher comorbidity and obesity rates. PCF was more commonly performed for congenital, traumatic, and neurologic conditions. Multilevel PCF demonstrated higher dysphagia (p=0.0004) and wound dehiscence (p=0.036). Ninety-day readmissions were high across groups (24–32%), highest after multilevel PCF (31.9%).

Conclusions:
Pediatric cervical fusion demonstrates substantial postoperative morbidity, particularly following multilevel posterior fusion and trauma-related indications. Elevated readmission rates suggest the need for improved perioperative management and risk stratification in this population.

Submitted by Julia Schneck

Air Pollution Induces Atrial Fibrosis via CARD9-Mediated Immune Response

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Background and Objective

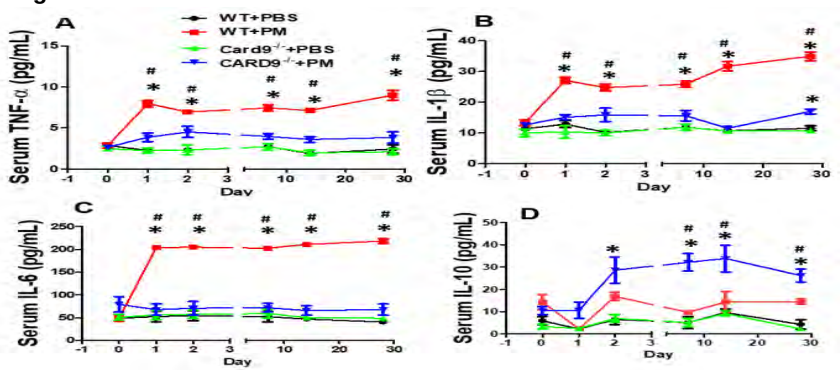
Exposure to ambient fine particulate matter (PM) triggers systemic inflammation, leading to atrial fibrosis and cardiac arrhythmia. The cytosolic adaptor caspase recruitment domain 9 (CARD9), a key adaptor in macrophage function, mediates the immune response. This study explores the role of CARD9 in PM-induced inflammation and its harmful effects on the heart atrium.

Methods

Male C57BL/6 WT and CARD9 knockout mice (4-6 months, n=8-12) were intranasally exposed to PM for 1, 2, 7, 14, and 28 days. Serum levels of TNF-α, IL-1β, IL-6, and IL-10 were measured via ELISA. Macrophage populations and M1/M2 subtypes in bone marrow (BM) and blood were analyzed. BM macrophages were cultured to assess their response to PM exposure. Atrial cardiomyocytes were analyzed for p-Akt, p-Erk, and Ankyrin-B via immunoblotting, and AF area was measured using Masson's trichrome staining.

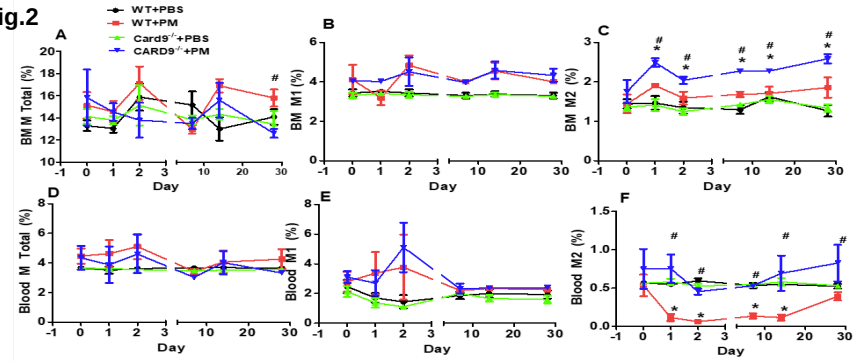
Results

Fig.1



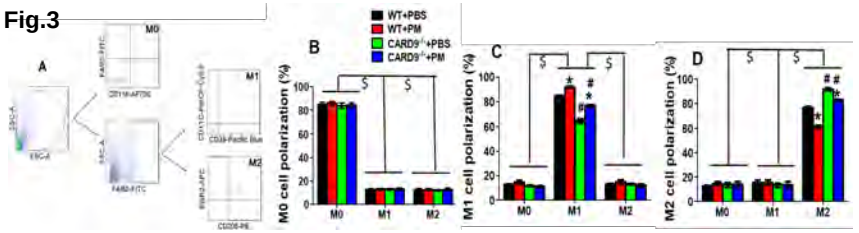
CARD9 deficiency prevented PM exposure-induced elevated serum inflammatory cytokines

Fig.2



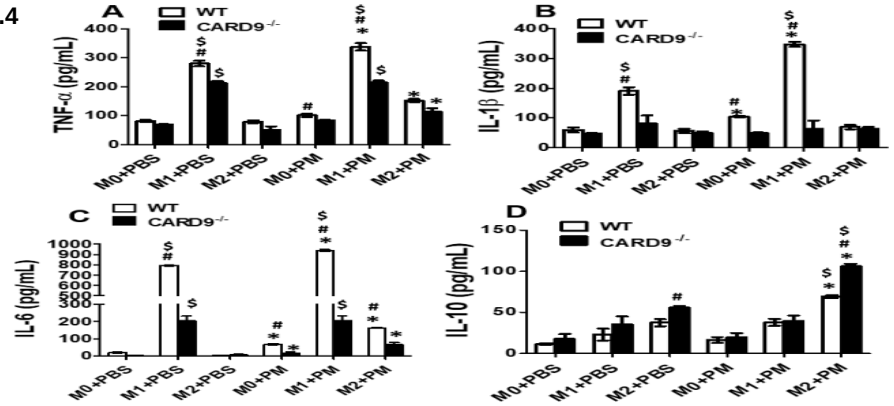
The BM and blood M2 population were significantly increased in CARD9-/- mice compared with WT mice following PM exposure

Fig.3



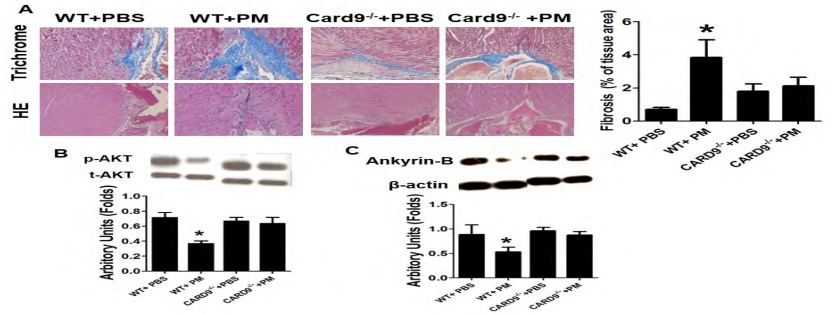
CARD9 deficiency prevented PM exposure-induced M1 polarization and inflammatory cytokine production *in vitro*

Fig.4



CARD9 deficiency prevented PM exposure-induced M1-related inflammatory cytokine production and enhanced M2-related IL-10 production in vitro.

Fig.5



Increased atrial fibrosis area with PM exposure was significantly decreased in mouse with NAC treatment, or with CARD9 deficiency

Conclusion

PM exposure-induced AF may be linked to an enhanced macrophage inflammatory response through CARD9-mediated reduction in IL-10 secretion, resulting in a decreased M2 macrophage polarization from M0 macrophage.

Acknowledgements

This work was supported by a US NIH grant to ZL (NIH R01 HL094650) and an American Heart Association grant to HZ (AHA 12SDG12070174)

Abstract:
Chronic spontaneous urticaria is frequently idiopathic, with infectious triggers often overlooked. We report a 46-year-old male with chronic diffuse urticaria found to have Helicobacter pylori–positive chronic gastritis on endoscopic biopsy despite minimal gastrointestinal symptoms. This case highlights H. pylori as a potential extra-gastric contributor to chronic urticaria.

Introduction:
Urticaria is a common mast cell-mediated cutaneous disease presenting with pruritic wheals, angioedema, or both. It is classified as acute (≤6 weeks) or chronic (>6 weeks) and as spontaneous (no definite triggers) or inducible (definite and subtype-specific triggers) [1]. Chronic urticaria (CU) has numerous causes, yet in a majority of cases, it is idiopathic [2]. In more recent studies, Helicobacter pylori (H. pylori) has been subject to much research as a leading cause of CU. In fact, H. pylori has been implicated in an infectious role in peptic ulcer disease, chronic active gastric [3].

Recent evidence suggests that H. pylori may contribute to CU through systemic immune activation rather than direct cutaneous infection. Proposed mechanisms include molecular mimicry, chronic antigenic stimulation, and increased gastric permeability leading to circulating immune complexes capable of mast cell activation [4,5]. Several observational studies and meta-analyses have demonstrated partial or complete resolution of CU symptoms following successful H. pylori eradication, supporting a potential causal or disease-modifying role in a subset of patients [6]. Despite this, routine testing for H. pylori in CU remains controversial, and current guidelines do not universally recommend screening in the absence of gastrointestinal symptoms [1]. This case therefore contributes to the growing body of literature suggesting that select patients with refractory CU may benefit from targeted infectious evaluation. We present a novel presentation of a rare condition of CU with H. pylori positive on endoscopy that is diagnosed in adulthood.

Case Description:
We present a unique case of a 46 year-old south asian male who was self referred via ChatGPT for diffuse urticarial wheals for several months. He has a history of allergies to tree nuts as well as cat dander. The patient states that eating foods with cheese or sugars causes the hives to flare within 4-5 hours of consumption. Moreover, the patient altered their diet and lost 20 pounds within 3 months. Family history is not significant for any allergies, gastrointestinal (GI) cancers or Inflammatory Bowel Disease (IBD). The patient denied gastrointestinal symptomps including nausea, vomiting and bloating. Abdominal exam was benign and diffuse urticaria was observed on physical exam. The patient was seen by an allergist beforehand and all secondary causes such as worm infestations were ruled out. Initial findings depicted hemoglobin of 15.6 g/dL, white blood cell 7,300 mcL and platelets of 19,700 mcL as well as HbA1C of 5.5%. The patient consented to undergo endoscopy which revealed focally active chronic gastritis with H. pylori immunostaining positive for organism within the stomach antrum as well as body. He is treated with triple therapy consisting of rifabutin 150mg twice daily, amoxicillin 1000mg twice daily and omeprazole 20mg twice daily. If the urticaria does not resolve with the eradication of H. pylori, the patient is recommended to follow up with an allergist to start on Xolair.

Discussion:
To our knowledge, this is one of the first reported cases of CU with H. pylori infection. The current literature review does not examine patients that have chronic diffuse urticarial wheals despite positive

endoscopic histological testing for H. pylori. This case highlights the importance of considering extra-gastric manifestations of H. pylori, particularly in patients with chronic spontaneous urticaria that is refractory to dietary modification or standard antihistamine therapy. Although gastrointestinal symptoms were notably absent in this patient, histologic confirmation of active infection supports the concept that H. pylori associated immune dysregulation may occur independently of overt GI disease [4]. Additionally, the use of rifabutin-based triple therapy reflects evolving treatment strategies in the context of rising clarithromycin resistance, further underscoring the need for individualized management approaches [7]. Recognition of H. pylori as a potential trigger in CU may facilitate earlier diagnosis, reduce unnecessary dietary restriction, and prevent progression to biologic therapy when eradication alone may be sufficient. Future studies can examine a larger cohort of patients that present with similar symptoms to determine the underlying cause. Above all, it is essential to provide knowledge to patients as well as physicians alike.

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Submitted by Kian Ghodrati

Investigating the Effects of GLP-1R Agonists on Colorectal Cancer: A Retrospective and Mouse Model Study

Kennedy Johnson, Sarita Garg, Ph.D., Dr. Isabelle R. Miousse, Ph.D.

Background:

Semaglutide and tirzepatide are two glucagon-like peptide-1 receptor agonists (GLP-1RAs) commonly used for type 2 diabetes (T2D) management and weight loss. Recent evidence suggests that GLP-1RAs decrease cancer incidence, but effects on cancer progression and the underlying molecular mechanisms remain poorly understood. This project investigates the role of semaglutide and tirzepatide as anti-tumor agents in colorectal cancer (CRC) using a mouse model and retrospective clinical analysis.

Objectives:

We evaluated GLP-1RA antitumor efficacy, identified underlying molecular mechanisms, and assessed clinical relevance in CRC patients with comorbid T2D. We hypothesized that GLP-1RA treatment would suppress tumor growth by modulating proliferative and apoptotic pathways and improve prognosis, including reduced metastasis and improved overall survival.

Methods:

Female mice bearing MC38 colorectal tumors had received vehicle, semaglutide, or tirzepatide for 20 days. In this project, we assessed molecular markers in tumor tissues using Western Blot and evaluated clinical relevance using a multi-institutional TriNetX cohort study.

Results:

GLP-1RA-treated mice exhibited reduced final tumor volumes compared to controls. Semaglutide upregulated mTOR pathway-related proteins, indicating a potential mechanism. Clinical analysis revealed that semaglutide and tirzepatide use was associated with a reduced risk of secondary malignancies and an improved overall survival rate compared to non-users.

Conclusion:

Our findings suggest that GLP-1RAs may exert beneficial effects on colorectal cancer progression through modulation of oncogenic pathways and may have clinical benefit in patients with CRC and T2D, although further studies are needed to confirm and refine our findings.

Submitted by Kennedy Johnson

Multimodal Management of Distal Neuropathic Pain Using Tibial Nerve Stimulation After Minimally Invasive Lumbar Decompression

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Background
Minimally invasive lumbar decompression (MILD) is an established intervention for lumbar spinal stenosis that alleviates mechanical compression and improves function. Despite anatomically successful decompression, some patients experience residual or recurrent nerve compression manifesting as chronic distal neuropathic pain consistent with failed back surgery syndrome (FBSS). Peripheral nerve stimulation (PNS) may be added after MILD to address unresolved focal neuropathic pain.

Objective
This case report evaluates a multimodal strategy using tibial nerve PNS following MILD to treat persistent distal S1 neuropathic pain.

Methods
A 61-year-old male with severe lumbar spinal stenosis from L4 to S1 with lateral recess stenosis contacting the descending S1 nerve root and bilateral foraminal narrowing underwent MILD. Postoperatively, proximal pain resolved, but severe neuropathic pain persisted in the right foot and ankle in an S1 distribution. Given the focal distal symptoms, a percutaneous tibial nerve PNS trial was performed. After success, permanent implantation followed.

Results
Before any intervention, pain was rated 10/10. After MILD, proximal symptoms resolved, while distal S1 neuropathic pain remained. Following a three-day tibial nerve PNS trial, pain improved to 3/10. After permanent implantation, the patient reported near-complete resolution of foot and ankle pain with sustained functional and quality-of-life improvements. No complications occurred.

Conclusions
This case suggests that distal peripheral nerve stimulation can effectively target residual neuropathic pain that persists despite adequate decompression after MILD. Incorporating focal neuromodulation may expand treatment options for patients with localized distal symptoms following minimally invasive spine procedures and warrants further investigation.

Submitted by Kainza Khan

A Comparison of Anthropometric Measures between Dual X-Ray Absorptiometry (DEXA) and Bioelectrical Impedance Analysis (BIA): The Impact of Orthopaedic Implants

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Background: Accurate body composition assessment informs perioperative risk stratification and recovery optimization. Dual X-ray absorptiometry (DXA) is the reference standard but is limited by cost and access, while bioelectrical impedance analysis (BIA) offers a rapid alternative. Prior studies show moderate BIA–DXA agreement with wide individual error and frequent BIA overestimation of lean mass. Orthopedic implants may introduce DXA artifacts and could theoretically alter BIA conductivity, yet their impact on body composition measures remains poorly understood.

Objective: To evaluate agreement between BIA and DXA for fat mass (FM), lean body mass (LBM), and percent body fat (PBF), and to determine whether orthopedic implants influence BIA–DXA measurement differences, proportional bias, or DXA-derived bone outcomes.

Methods: In this cross-sectional method-comparison study, paired BIA (InBody) and DXA (Hologic) measurements were analyzed in 200 adults (age 54.7±15.7 years; BMI 27.6±4.4; 75% female), including 28 with orthopedic implants. Agreement was assessed using mean bias (BIA−DXA), Pearson correlation, ICC(A,1), and Bland–Altman analyses. Implant effects were evaluated using Welch tests and regression models adjusted for age, sex, and BMI.

Results: BIA overestimated LBM relative to DXA (+4.02 kg; $p<0.001$), while FM and PBF showed minimal bias. Agreement was moderate with wide limits. Implants were not associated with BIA–DXA bias, proportional bias, or adjusted body composition estimates (all $p\geq0.31$). In contrast, implants were strongly associated with higher DXA-derived BMD, T-scores, and Z-scores (all $p\leq3.3\times10^{-}7$).

Conclusions: BIA showed moderate agreement with DXA but overestimated lean mass. Implant status did not meaningfully alter soft-tissue body composition estimates but substantially inflate DXA bone metrics. Implant status should therefore be considered when interpreting DXA-derived bone outcomes but are not a concern for musculoskeletal measures via DXA or BIA.

Submitted by Landon Sandage

Geographic access to neurosurgery in the United States: a one-hour drive-time analysis

Lawrence VanDyke BS, Congcong Miao MS, Lily DeSpain BS, Gabriel Dharwadke BS, Clayton Frazier MS, Justin Long BS, Erika A. Petersen MD

Background

Timely access to neurosurgical care is critical for reducing morbidity and mortality from traumatic and non-traumatic neurologic emergencies. Despite increasing demand, the neurosurgical workforce has declined, particularly in rural regions, potentially exacerbating geographic disparities.

Objectives

To evaluate geographic access to neurosurgical services in the United States using a travel-time–based approach and to identify populations underserved by a one-hour drive-time threshold.

Methods

Clinic addresses for 4,371 actively practicing, Medicare-billing neurosurgeons were obtained from the 2023 Medicare Physician Public Use File. Network-based one-hour drive-time service areas (OHSAs) were generated around each clinic using existing road infrastructure. U.S. Census population data were overlaid to estimate the proportion of the population residing within and outside any OHSA at national and state levels.

Results

92.83% of the U.S. population resides within one hour of a Medicare-billing neurosurgeon, while 7.17% live outside any OHSA. States in the Mountain West and West had the highest proportions of residents outside an OHSA, led by Wyoming (55.4%), Montana (53.8%), and Alaska (46.2%). In contrast, densely populated northeastern and midwestern states demonstrated excellent coverage, many with fewer than 3% of residents living outside an OHSA. Geographic complexity, size, and sparse road networks were contributors to prolonged travel times in underserved regions.

Conclusions

A one-hour drive-time model provides a meaningful assessment of geographic access to neurosurgical care and identifies substantial neurosurgical “deserts” in the United States. These findings have implications for workforce planning, regional trauma system design, and policy initiatives aimed at improving equitable access to time-sensitive neurosurgical services.

Submitted by Lawrence VanDyke

Title: Do Negative Chronotropic Medications Affect the Outcomes of Tilt Table Testing in Non Hypermobile Patients?

Authors: Larissa Whale, OMS-II, Jared Wilber, OMS-II, Ruchitha Arvapally, OMS-II, Bilal Niazi, OMS-II, Todd J Cohen MD

Background: Tilt table testing (TTT) can be useful in evaluating patients with unexplained and/or recurrent syncope/presyncope and Postural Orthostatic Tachycardia Syndrome (POTS). Some patients may be on negative chronotropic agents such as β-blockers and nondihydropyridine calcium channel blockers (non-DHP CCB), which may have a confounding effect on the TTT outcome. The Long Island Heart Rhythm Center (LIHRC) provides cardiac care at a large osteopathic medical school (NYITCOM) and its hypermobility treatment center including the evaluation of syncope/presyncope and POTS. Although negative chronotropes are known to affect TTT outcomes and may obscure the diagnosis of POTS, their specific impact in patients without underlying hypermobility has not been well characterized.

Objective: To explore the effect of negative chronotropic medications on TTT outcomes in non hypermobile patients.

Methods: LIHRC patients with syncope, presyncope, and/or POTS who received TTT between 2019 and 2025 were included. Patients with Ehlers–Danlos Syndrome/Hypermobility Spectrum Disorder were excluded. TTT outcomes and concurrent medication use were documented. Binary logistic regressions were used and were adjusted for age and sex. Data reported as mean ± SD and $p \leq 0.05$ was considered statistically significant.

Results: 280 patients with syncope/presyncope, and/or POTS of which 124 had tilt table testing and 91 (73.4%) non-hypermobile patients were the subject of this study. 73 (80.2%) were not on negative chronotropic medications: age 40.08±18.3 years; M/F (9.6%)/(90.4%). 18 (19.8%) were on negative chronotropic medications (13 β-blockers, 5 non-DHP CCB therapy): age 50.6±17.2 years; M/F (22.2%)/(77.8%). Logistic regression showed younger age was associated with a POTS diagnosis during TTT ($p = 0.018$). There was a trend towards less TTT- diagnosed POTS in those on negative chronotropes ($p = 0.060$). All other binary logistic regressions were non significant.

Conclusions: Negative chronotropic medications may affect the outcome of TTT in non hypermobile patients. In this study there was a trend towards less POTS identified during TTT in those on negative chronotropic medications. In addition, younger age was associated with POTS

Submitted by Larissa Whale

during TTT. A case-controlled study would help determine the true impact of negative chronotropic medications on TTT results in this cohort.

Submitted by Larissa Whale

Comparison of Emergency Winter and Shelter Activation Criteria by Region in the United States

Background
During winter weather emergencies, U.S. cities activate low-barrier sheltering and other protections to prevent cold-related morbidity and mortality among people experiencing homelessness. Activation criteria for these emergency responses vary widely across municipalities and are largely determined by local officials. The factors influencing these thresholds are not well characterized.
Objectives
To examine national trends in winter weather emergency activation criteria and whether local climate severity and precipitation influence activation thresholds for low barrier sheltering.
Methods
The three most populous cities from each of the nine U.S. Census geographic regions were selected. For each city, the mean annual number of days below freezing was obtained from National Oceanic and Atmospheric Administration data. Winter activation criteria, including temperature thresholds with and without precipitation, were identified through publicly available sources and confirmed via direct contact with city officials. Analysis of covariance and ordinary least squares regression were used to assess relationships between climate variables and activation criteria, with a 95% confidence interval.
Results
Analysis demonstrated a statistically significant inverse relationship between the mean number of days below freezing and activation temperature for low barrier sheltering ($p=0.0004$), indicating that colder cities activate shelters at lower temperatures. Precipitation did not significantly affect activation thresholds ($p = 0.4903$). Regression models showed modest explanatory power, with coefficients of determination of 0.25 and 0.17 for activation criteria without and with precipitation, respectively.
Conclusions
Cities with colder climates tend to adopt lower activation thresholds for winter emergency sheltering. However, precipitation does not appear to meaningfully influence activation decisions, and climate variables alone explain only a portion of threshold variability. These findings suggest that non-climatic factors such as resource constraints, policy priorities, and local burden of cold-related injury play a substantial role. Standardized, evidence-based activation guidelines may improve equity and consistency in winter weather emergency responses.

Submitted by McKenzie Hendrix

Young Adult and Adult Skin Conditions Across Skin Tones

Mark Johnson

Background: Young adult and adult dermatologic conditions encompass a wide range of inflammatory, infectious, pigmentary, and malignant disorders. Despite their prevalence, medical education underrepresents how these conditions present and respond to treatment in patients with darker skin tones, contributing to diagnostic and therapeutic disparities.

Objective: To create an educational resource that highlights presentational differences and management of common young adult and adult skin conditions across skin tones utilizing the full Fitzpatrick Scale.

Methods: Clinical images, descriptive features, and treatment strategies were compiled for six adult dermatologic conditions: psoriasis, melanoma, seborrheic dermatitis, vitiligo, tinea versicolor, and molluscum contagiosum. Images were sourced from the American Academy of Dermatology. Targeted literature reviews were conducted for each condition, emphasizing variations in disease morphology, treatment response, adverse effects, and pigmentary outcomes across Fitzpatrick skin types. The Fitzpatrick scale was used as a standardized reference point.

Results: Variation in erythema, scaling, lesion morphology, and pigmentary contrast was observed across skin tones. Treatment considerations differed for several conditions, including increased risk of dyspigmentation with topical corticosteroids, retinoids, and procedural therapies in darker skin.

Conclusion: By integrating diagnostic and treatment-based differences across skin tones, this resource addresses a critical gap in dermatologic education. This work aims to improve clinical decision-making, reduce disparities, and enhance outcomes for young adult and adult patients across the spectrum of skin pigmentation

Submitted by Mark Johnson

Primary tumors reprogram osteocytes to facilitate breast cancer bone metastasis

Mattie R. Nester[1], Japneet Kaur[1,2], Bethany C. Paxton[1,2], Hayley M. Sabol[1,2], Aric Anloague[1], Sharmin Khan[1], Sanja Novak[1], Intawat Nookaew[2,3], Ruud P.M. Dings[4], Jesus Delgado-Calle[1,2]

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Background. Bone metastases occur in ~70% of patients with advanced breast cancer (BCa) and remain a barrier to improving patient outcomes. Early intervention is critical, as established bone lesions are typically incurable. Metastasis begins with the formation of a pre-metastatic niche (PMN) that prepares distant tissues for colonization; however, the early events preparing bone for the arrival of BCa cells remain poorly defined.

Objectives. We investigated the role for osteocytes, the most abundant bone cell and key sensors of systemic cues, in the earliest stages of BCa bone metastasis.

Methods. To model PMN formation, BCa cells were orthotopically implanted in mice. Primary tumors were resected prior to detectable bone metastasis at 4 weeks. BCa cells were then injected intracardially to model hematogenous dissemination and subsequent colonization.

Results. Mice with resected primary tumors showed a 60% increase in BCa bone colonization compared to naïve mice. This was associated with significant vascular remodeling and increased permeability. Single-cell RNA sequencing of endosteal cells identified osteocytes, rather than osteoblasts or their precursors, as the primary source of upregulated vascular remodeling genes. Histology confirmed increased osteocyte derived *Vegfa*. *In vitro*, BCa-conditioned media reprogrammed osteocytes to overexpress *Vegfa* and promoted angiogenesis. Furthermore, osteocyte-specific *Vegfa* knockdown significantly reduced tumor growth in an *ex vivo* bone metastasis model.

Conclusions. These results identify osteocytes as remote responders to primary tumors that drive vascular remodeling to facilitate BCa colonization, revealing a promising target for early intervention in BCa.

237/250 words

Submitted by Mattie Nester

Comparative retrospective chart review study of breast cancer patients who opt in or who opt out for genetic testing and their follow-up outcomes Megan Pelley[1], Alexandrea Wadley[2], Ashlynn Fuccello[5], Kim Gates[4], Crystal Croswell[5], Ronda Henry-Tillman[5], Daniela A. Ochoa[5]

Background: Genetic testing is integral to breast cancer management. Despite national guideline recommendations, disparities in testing uptake persist and may be influenced by demographic and socioeconomic factors.
Objectives: To evaluate whether demographic and socioeconomic characteristics are associated with the decision to undergo genetic testing among newly diagnosed breast cancer patients and to assess whether testing uptake is associated with overall survival.
Methods: A retrospective chart review was conducted of female patients aged ≥18 diagnosed with breast cancer between January 1, 2021 and December 31, 2021 at University of Arkansas for Medical Sciences. Data collected included age, race/ethnicity, education, employment, marital status, insurance type, geographic location, cancer stage, tumor characteristics, comorbidities, family history of breast cancer, genetic testing decision and results, and survival data through December 31, 2023. Multivariable logistic regression identified factors independently associated with testing uptake.
Results: Among 246 newly diagnosed patients, 154 (62.6%) underwent testing. In multivariable analysis, testing uptake was independently associated with younger age (OR 0.97 per year, 95% CI 0.94-0.99; p=0.022), married status (OR 2.79, 95% CI 1.40-5.70; p=0.004), and family history of breast cancer (OR 2.50, 95% CI 1.26-5.12; p=0.010). Testing uptake was not associated with improved overall survival.
Conclusion: Genetic testing uptake was associated with younger age, marital status, and family history of breast cancer but not overall survival. Identifying barriers to testing may inform targeted counseling, reduce disparities, and promote equitable breast cancer care.

Submitted by Megan Pelley

"Beyond City Limits: Evaluating Dermatologic Preparedness and Attitudes in Rural Medical Students"

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NYIT College of Osteopathic Medicine at Arkansas State

Background: Approximately half of osteopathic medical students enter primary care specialties, often practicing in underserved communities with limited access to dermatologic care. In these settings, primary care physicians serve as the first point of contact in evaluating skin conditions.

Objectives: This study aimed to assess medical students' preparedness in recognizing and managing common dermatologic conditions, identify perceived barriers to care in underserved areas, and evaluate how current curriculum prepares students for clinical practice.

Methods: An anonymous, cross-sectional survey was developed and distributed via REDCap to osteopathic medical students (OMS I-IV). Survey domains included dermatologic lesion morphology, cutaneous manifestations of systemic diseases, treatment and counseling strategies, and case-based scenarios reflective of rural primary care. Confidence levels in recognition and management were self-reported using Likert-scale responses.

Results: Students demonstrated strong performance in identifying lesion morphology (eg, macules, nodules, papules, bullae), recognizing cutaneous presentations of systemic diseases (eg, systemic lupus erythematosus, dermatomyositis, herpes simplex virus, diabetes mellitus), and managing atopic dermatitis. Knowledge gaps included distinguishing psoriasis from atopic dermatitis, treatment for rosacea, and hidradenitis suppurativa counseling. Overall confidence was low, with 42.9% of students reporting low confidence in recognition and 52.4% in management of common dermatological conditions. Most students (95.2%) felt dermatology education could be improved, and 85.7% expressed interest in additional dermatology training.

Conclusion: These findings highlight gaps in dermatologic preparedness and support the need for enhanced dermatology education and training regarding diagnostic differentiation, management, and patient counseling to better prepare future primary care physicians in underserved communities.

Submitted by Mary Claire Swaim

Title: Associations Between Social Determinants of Health and Preoperative Body Composition and Muscle Health Markers in Total Joint Arthroplasty

Bogart N.D.[1], White D.W.[1], Johnson C.R.[1], Sandage L.B.[1], Parsons L.J.[1], Dodd R.E.[1], Hill J.R.[1], Barnes C.L.[1], Mears S.C.[1], Stambough J.B.[1], Stronach B.M.[1], Rabinowitz J.M.[1], & Kviatkovsky S.A.[1]

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Background: Social determinants of health (SDOH) may influence preoperative nutrition and muscle health, but links with objective body composition and muscle quality markers in surgical candidates are not well described.

Objective: To describe SDOH risk prevalence and evaluate associations between SDOH domains and preoperative body composition and muscle health markers in patients undergoing elective total joint arthroplasty (TJA) of the hip, knee, and shoulder.

Methods: We analyzed adults with preoperative bioelectrical impedance analysis and SDOH screening (N=118). Outcomes included BMI, percent body fat (PBF), phase angle (PhA), skeletal muscle index (SMI), and maximal handgrip strength (HGS). SDOH predictors included tobacco, alcohol, financial resource strain, food insecurity, physical activity, stress, social connection, depression, and housing instability. SDOH prevalence was summarized as n (%). Associations between SDOH variables and continuous outcomes were assessed using Spearman correlations (α=0.05).

Results: Prevalence of SDOH risk was food insecurity 10.3% (9/87), financial strain 27.0% (17/63), alcohol misuse 13.6% (8/59), inactivity 36.2% (21/58), stress 34.4% (21/61), social isolation 51.9% (28/54), depression 10.0% (5/50), and housing instability 25.3% (19/75). Mean±SD outcomes were: BMI 30.17±5.78, PBF 35.13±9.20, PhA 5.02±0.81, SMI 7.96±1.45, and HGS 70.21±25.23. Stress was associated with lower HGS (ρ=−0.263, p=0.041, n=61). Social isolation correlated with higher BMI (ρ=0.282, p=0.050, n=49). Housing instability correlated with lower SMI (ρ=−0.239, p=0.046, n=70). No other correlations were significant (all p>0.05).

Conclusions: Stress, social isolation, and housing instability were associated with worse preoperative muscle strength and/or muscle mass. Integrating SDOH screening may improve preoperative risk stratification and optimization.

Submitted by Noah Bogart

Investigating the use of DNA-PKcs Inhibitors for Melanoma Therapy

Nicole K. Hooten BS, Randall R. Rainwater BS, Ana Azevedo-Pouly PhD, Lyle Burdine M.D., Marie Schluterman Burdine Ph.D.

Background
DNA-dependent protein kinase catalytic subunit (DNA-PKcs) is upregulated in cancer and contributes to chemotherapy resistance through non-homologous end joining. Clinical trials using DNA-PKcs inhibitor NU7441 have shown resensitization of cancer to DNA-damaging agents. Melanoma is highly resistant to treatment, and the role of DNA-PKcs inhibition in melanoma remains understudied. DA-143 is a DNA-PKcs inhibitor synthesized by the Burdine and Frett laboratories with improved solubility and bioavailability compared to currently available inhibitors.

Objective
Determine activity of DA-143 on melanoma cells and ability of DNA-PKcs inhibitors to resensitize melanoma cells to doxorubicin, a chemotherapy not normally effective against melanoma.

Methods
B16F10 mouse melanoma cells were treated with dimethyl sulfoxide (DMSO), or DNA-PKcs inhibitors NU7441 or DA-143 at 0.5 μM or 5μM. Western blotting assessed total DNA-PKcs and phosphorylated DNA-PKcs levels. A wound scratch assay tracked cell migration over 12 hours. Apoptosis was measured using Annexin APC and 7-AAD staining followed by flow cytometry after treatment with doxorubicin.

Results
DA-143 inhibited activation of DNA-PKcs by blocking phosphorylation of DNA-PKcs, similar to NU7441. 5μM DA-143 significantly reduced cell migration compared to DMSO controls and demonstrated results similar to equivalent NU7441 concentrations. Apoptosis assays did not show significant resensitization of melanoma cells to doxorubicin following DNA-PKcs inhibition.

Conclusion
DA-143 shows comparable activity to NU7441 as a DNA-PKcs inhibitor in melanoma, inhibiting both DNA-PKcs phosphorylation and cell migration. Apoptosis assays did not support resensitization of melanoma to chemotherapy.

Submitted by Nicole Hooten

Vancomycin Elution from MgPO4 vs CaSO4 Bone Filler for Orthopedic Infection Prevention

Nathania Nischal, Mara J. Campbell Ph.D., Karen E. Beenkan Ph.D., Mark S. Smeltzer Ph.D.

Background
Many patients may have bone deficits due to trauma or surgical debridement and require bone grafts or bone substitutes. Calcium sulfate ($CaSO_4$) is a commonly used bone filler that is prepared in the operating room, and has been shown to elute vancomycin effectively over a short period of time. Magnesium phosphate (MgPO4) bone fillers are relatively new, and may offer increased bone strength and more ideal resorption time than $CaSO_4$ bone fillers. Incorporation of antibiotics into $MgPO_4$ has yet to be assessed.

Objectives
This project aims to assess the elution of antibiotics and its impact on structural integrity of $MgPO_4$ bone filler in comparison to $CaSO_4$ to determine whether it is a viable option for antibiotic incorporation.

Methods
Using an *in vitro* assay in which the elution buffer was replaced in its entirety every 24 hours for 9 days, we assessed the amount of vancomycin released from both $CaSO_4$ and $MgPO_4$ beads over time. Structural integrity of the beads was assessed via micro-computed tomography.

Results
Comparable amounts of vancomycin are released from both bone fillers on days 1 through 3. However, on days 6 through 9 the amount of vancomycin released from $MgPO_4$ beads significantly exceeded the amount released from $CaSO_4$. The inclusion of vancomycin did not impact the set time or structural integrity of $MgPO_4$ beads.

Conclusion
These results suggest that $MgPO_4$ may offer added benefits for the prevention of orthopaedic infections following traumatic injury to the bone and the recurrence of infection following surgical debridement of an established infection.

Submitted by Nathania Nischal

Synergistic Comparison of Ceftobiprole and Ceftaroline with Daptomycin for Biofilm Prevention

Nathania Nischal, Randall R. Rainwater, Mara J. Campbell Ph.D, Ryan K. Dare M.D., Karen E. Beenkan Ph.D., Mark S. Smeltzer Ph.D.

Background
Ceftobiprole is a fifth-generation cephalosporin demonstrating increased activity against a broad spectrum of bacteria, including Methicillin-resistant S. aureus (MRSA). MRSA is a major concern following orthopedic surgeries, notorious for developing treatment resistant biofilms. Ceftaroline is currently used with daptomycin to limit biofilm formation but has a limited spectrum of activity. Ceftobiprole has demonstrated synergy with daptomycin; however its synergy in comparison to ceftaroline and its efficacy against biofilms has yet to be characterized.

Objectives
This study aims to assess ceftobiprole's synergy with daptomycin in comparison to ceftaroline. Further, this study aims to assess ceftobiprole's efficacy at preventing biofilm formation in combination with daptomycin.

Methods
Checkerboard assays were performed to compare synergy of daptomycin with ceftobiprole and ceftaroline. Both were administered with daptomycin to catheters treated with Methicillin-resistant USA300 strain LAC to assess efficacy against *in vitro* biofilm formation and compared to efficacy of single antibiotic administration.

Results
Ceftaroline demonstrated clearer synergy with daptomycin than ceftobiprole, however additional trials are needed to clarify this relationship. Both combinations were more effective than single drug administration against biofilm formation. By D3, ceftaroline and ceftobiprole with daptomycin were not significantly different from each other in terms of elimination of biofilms.

Conclusions
Ceftobiprole may be a viable alternative to ceftaroline with daptomycin due to its similar activity against MRSA biofilm formation. As the majority of implant-related infections in an orthopedic setting involve biofilm formation, additional options with broader spectrum coverage could improve patient outcomes. However, ceftobiprole's activity must be further assessed *in vivo* to fully assess its potential benefits.

Submitted by Nathania Nischal

Associations Between Brain White Matter Development in 8-year-old Children and Maternal Physical Activity During Pregnancy

Authors: Nada Tolba, Xiaoxu Na, and Xiawei Ou

Background

The impact of maternal physical activity on fetal development has been studied, however the potentially long-lasting impact of maternal physical activity on brain development is not yet known. Potential effects on long term brain development, especially white matter which is essential for neurodevelopmental outcomes still need to be characterized.

Objective

Our aim is to characterize potential impact of physical activity on brain white matter development, specifically by analyzing relationships between maternal physical activity and white matter microstructure in 8-year-old children.

Methods

Physical activity of healthy pregnant women (N=40) was monitored using accelerometers which logged daily total steps and activity as well as time spent in each of the following modes of activity: sedentary, light, moderate, and vigorous. Brain images of offspring were obtained at 8 years of age using advanced Diffusion Weighted Imaging (DWI) and analyzed using Tract-Based Spatial Statistics (TBSS) and both the Diffusion Tensor Imaging (DTI) and the Neurite Orientation Dispersion and Density Imaging (NODDI) model.

Results

Significant negative correlations ($p <= 0.05$) were found between light exercise during the first trimester of pregnancy and mean orientation dispersion index (ODI) in the internal capsule. Light exercise during the second trimester of pregnancy was also negatively correlated with ODI in the internal capsule and positively correlated with Fractional Anisotropy (FA) in the External capsule. Lower ODI and higher FA are both indicative of better brain white matter microstructural development.

Conclusions

Our findings indicate that physical activity during pregnancy may have long-lasting implications on brain development in children.

Submitted by Nada Tolba

When Broad-Spectrum Is Not Enough: Fatal Septic Shock From Vancomycin-Resistant *Enterococcus faecium*

Phat Duong[1], Mohamed Mraiyan[2], Baylee King[2], Paige Nappier[2], Ishita Gupta[2], Kayla Long[2], Yuqi Cui[2]

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Background:
Timely administration of appropriate antimicrobial therapy is a cornerstone of sepsis management. Delays in effective coverage, particularly in critically ill patients with evolving shock and organ failure, are associated with increased mortality. We report a case of refractory septic shock in which delayed identification and treatment of vancomycin-resistant *Enterococcus faecium* (VRE) bacteremia may have contributed to a fatal outcome.
Case Presentation:
A 64-year-old woman with a history of polysubstance abuse and psychiatric disease presented with altered mental status and laboratory evidence of severe sepsis, including leukocytosis, lactic acidosis, acute kidney injury, and metabolic derangements. She was admitted to the ICU with presumed urosepsis and treated empirically with piperacillin–tazobactam. Despite early source control measures and hemodynamic support, her course rapidly progressed to refractory septic shock with worsening lactic acidosis, anuric renal failure requiring continuous renal replacement therapy, and multiorgan dysfunction. Blood and urine cultures remained negative for several days, and broad-spectrum beta-lactam therapy was continued. On hospital day 7, blood cultures grew gram-positive cocci, prompting a change to vancomycin. The patient subsequently suffered cardiac arrest with profound metabolic acidosis and escalating vasopressor requirements and expired on hospital day 9. Final blood culture speciation revealed vancomycin-resistant *Enterococcus faecium*, susceptible to linezolid and daptomycin.
Conclusion:
This case highlights the limitations of relying on preliminary or negative culture data in critically ill patients with persistent shock and worsening organ failure. Current sepsis guidelines emphasize early reassessment and escalation of antimicrobial therapy when clinical deterioration persists despite empiric treatment. Earlier initiation of VRE-active therapy in the setting of refractory septic shock may have altered the clinical trajectory and potentially improved survival. This case underscores the need for heightened suspicion of resistant organisms and proactive antibiotic adjustment based on clinical response rather than delayed culture confirmation.

Submitted by Phat Duong

Bollinger, Frances B.; Bosche, Emily A.; Breeding, Raegan R.; Brown, Caroline R. and Brown, Megan A.

Dissection Team Number: 4

Advisor: Jeanette M. Ramos, M.D., UAMS Department of Clinical Pathology

Findings and investigation of systemic amyloidosis: An initial anatomical and histological study

INTRODUCTION. Amyloidosis is a disease in which misfolded, insoluble beta-sheet fibrillar proteins aggregate within different tissues. These proteins can accumulate within tissues of the spleen, liver, nerves, heart, lung, and blood vessels. Amyloids can lead to failures within the tissue systems they occupy. Amyloidosis can be localized or systemic. Chronic inflammatory diseases are the most common causes of systemic amyloidosis. Systemic amyloidosis occurs in 6% of the total amyloidosis cases.

METHODS. Observations were collected from an adult female cadaver, who was greater than 80-years-old, during eight weeks of a didactic dissection course. Tissue samples were taken and analyzed by the UAMS Department of Pathology from the following locations: left ventricle, left breast tissue, apex of spleen, left lobe of liver, and left kidney.

FINDINGS. Evidence of surgical interventions was observed to the following sites: 1) uterus, 2) breasts, 3) appendix, and 4) palatine tonsils. Other observations include rib remodeling indicative of prior CPR, uterine prolapse, right-handed osteoarthritis, prominent bruising to extremities, and mild plaque buildup in carotid artery. Heart weight was 350mg, right ventricle thickness was 0.6cm, and left ventricle thickness was 2.2cm. Upon pathological inspection of sections taken from the locations listed above, systemic amyloidosis was found in all sections.

CONCLUSIONS. Based on our cadaveric dissection and examination of medical literature, systematic amyloidosis is consistently present. Due to the limitation of pathology and confidential patient history, the specific type cannot be determined. Differential diagnoses can be made based on the following findings: perivasculature amyloid plaque, over 80 years of age, findings in multiple systems, and no observable bony lesions. The most probable diagnosis is senile systemic amyloidosis, but light chain amyloidosis cannot be excluded without further testing.

Submitted by Raegan Breeding

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Submitted by Raegan Breeding

Geography as a Proxy for Socioeconomic Status in Total Joint Arthroplasty: Associations with BMI and Complications

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Background: Volumes of total joint arthroplasty (TJA) of the hip, knee, and shoulder are projected to increase substantially by 2030, while postoperative complications remain prevalent. Nutritional status is a modifiable risk factor for adverse outcomes and is more common among older adults and populations with obesity, food insecurity, and lower socioeconomic status (SES). Because patient-level SES is not routinely captured in orthopaedic registries, ZIP-code-derived geographic regions may serve as a pragmatic SES proxy.

Objectives: To evaluate whether a regional socioeconomic proxy (ZIP-derived region) is associated with BMI and postoperative complication rates among adults undergoing primary TJA at UAMS.

Methods: We conducted a 3-year retrospective cohort study of adults undergoing primary TJA at UAMS (N=2,266). Region was categorized using a six-level ZIP-code grouping as a proxy for SES. Postoperative complications were defined as documented postoperative problems and/or joint revisions. BMI differences by region were assessed using Welch's ANOVA (Kruskal-Wallis sensitivity). Complication rates were compared using Pearson's chi-square testing. Multivariable logistic regression evaluated associations between region and complications adjusting for age, BMI, sex, race, and procedure type.

Results: Mean BMI did not differ by region (Welch ANOVA p=0.087; Kruskal-Wallis p=0.142) with values shown in Table 1. Complication rates were similar across regions (p=0.636) and remained non-significant after adjustment (p=0.573).

Table 1. Regional BMI±SD in TJA Patients at UAMS

Region	**BMI (Mean±SD)**
Central	30.29±5.99
Southeast	31.14±6.14

Submitted by Reagan Dodd

Southwest	30.40±6.35
Northwest	30.02±5.36
Northeast	31.49±6.25
Outside Arkansas	30.07±5.21

Conclusions: ZIP-derived region showed no evidence of BMI or postoperative complications differing by region. Geographic SES proxies alone may be insufficient to identify patients at elevated risk, supporting the need for patient-level nutritional and social risk measures.

Submitted by Reagan Dodd

Remote patient monitoring for type 2 diabetes in pregnancy: device usability and maternal-neonatal outcomes.

Background: Type 2 Diabetes Mellitus (T2DM) during pregnancy is associated with adverse maternal and neonatal health outcomes. This study assessed the feasibility of using a Remote Patient Monitoring (RPM) iGlucose glucometer to manage T2DM during pregnancy among a cohort of Medicaid women and compared clinical outcomes among RPM users and women using a standard glucometer with paper log.

Method: Thirty-three pregnant women utilizing Medicaid with T2DM were provided an RPM iGlucose device. Participants completed a pre-post survey and semi-structured interview. To assess clinical outcomes, we created a Connected Device Use Group of participants who used the iGlucose device or a continuous glucose monitoring device (CGM), and Standard Paper Log group of individuals who used a standard glucometer.

Results: A significant decrease between pre-post scores was seen for Appraisal of Diabetes (p=0.0046) and Perceived Stress (p=0.0296). Treatment Self-Efficacy (p=0.0030) and General Self-Efficacy (p=0.0129) significantly increased with iGlucose device use. Overall, perceptions of the iGlucose device were positive with advantages including automatic upload of glucose readings, ease of use, increased self-efficacy, perceived better care, and decreased stress and anxiety. No significant difference in clinical outcomes was seen.

Conclusion: By automatically uploading glucose readings through a remote patient monitoring glucometer, remote patient monitoring significantly lightens the burden for people with chronic conditions like diabetes. Integrating this technology provides a

Submitted by Rebecca Jones

comprehensive view of glycemic control throughout pregnancy, enabling clinicians to identify glucose patterns early and shift from reactive management to proactive, data-driven decision-making.

Submitted by Rebecca Jones

Intraoral Endotracheal Tube Kinking in a Prone Infant with Achondroplasia: The Combined Impact of Neck Flexion and Thermal Softening: A Case Report

Fourteen-month-old child (8.4 kg) with achondroplasia presented for posterior fossa decompression for foramen magnum stenosis. Airway secured with 3.5 mm Microcuff ETT, child positioned prone with head flexed in Mayfield pins. Sixty minutes later, peak airway pressures rose from 16 to 38 cm H_2O with worsening hypoxia, hypercarbia. Breath sounds equal but diminished; no bronchospasm or external kink. Suction catheter couldn't pass; 2.8 mm bronchoscope got stuck, dislodging ETT during withdrawal. Removed tube showed intraoral kink. Excessive neck flexion and thermal softening likely causes. Patient turned supine, reintubated with 4 mm ETT and surgery resumed uneventfully with reduced neck flexion.

Submitted by Riley Swafford

Breathing in Silver: A Rare Case of Pulmonary Toxicity from inhaled Colloidal Silver

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Abstract

Background:

Silver-containing compounds are increasingly marketed for their antimicrobial properties and are readily available through nonregulated wellness platforms. While topical and medical uses of silver have been described, inhalational exposure— particularly via nebulized formulations—poses a significant and underrecognized risk for pulmonary toxicity.

Case Presentation:

We report a case of a 70-year-old male with chronic obstructive pulmonary disease, atrial fibrillation, and hypertension who presented with acute hypoxemic respiratory failure initially attributed to pulmonary embolism and suspected pneumonia. Despite anticoagulation and broad-spectrum antibiotics, his respiratory status progressively worsened. Imaging demonstrated evolving right upper lobe ground-glass opacities and consolidation. Further history revealed recent use of nebulized colloidal silver for respiratory symptoms. Bronchoscopy revealed marked mucosal erythema, friability, and blood-tinged secretions predominantly in the right lung. Bronchoalveolar lavage cultures were negative, and endobronchial biopsy demonstrated acute inflammation with focal crystalline foreign material consistent with inhaled particulate exposure. The patient developed refractory hypoxemia, shock, and multi-organ failure despite maximal supportive care. Given the poor prognosis, goals-of-care discussions were held, and the patient ultimately expired after transition to comfort measures.

Discussion:

Silver inhalation is believed to cause direct epithelial injury through oxidative stress, mitochondrial dysfunction, and inflammatory cell recruitment, leading to mucosal sloughing and impaired gas exchange. Although most data are derived from animal and in vitro studies, this case highlights severe and fatal pulmonary toxicity in a human subject.

Conclusion:

This case underscores the dangers of unregulated inhaled therapies and emphasizes the importance of eliciting detailed exposure histories in patients with unexplained pulmonary deterioration. Increased clinician awareness is essential as the use of alternative inhaled substances continues to rise.

Submitted by Rida Zaidi

Lymphatic Valve Dysfunction in Cutaneous Leishmaniasis

Co-authors: Spencer Hazeslip; Hayden Roys; Lucy Fry, PhD; Tiffany Weinkopff, PhD

Background:
Cutaneous *Leishmania* infection can cause prolonged inflammation requiring extended antiparasitic therapy. We discovered that changes in the lymphatic network influence inflammation severity, and that blocking lymphatic growth increases skin lesion size. However, the role of lymphatic valve function on inflammation during chronic skin infection remains poorly understood. Because lymphatic valves dictate lymphatic function, we hypothesize that valve damage disrupts lymph transport, causes fluid and cell accumulation in the skin, and ultimately sustains chronic inflammation.

Objectives:
To determine whether chronic cutaneous *Leishmania* infection is associated with altered lymphatic valve abundance and lymphatic dysfunction.

Methods:
Prox1–GFP reporter mice, which allow the visualization of lymphatic vessels, were infected intradermally in the ear with *Leishmania major*parasites. At 4 weeks post-infection, dermal lymphatic vessels and valves were imaged by fluorescence microscopy. Segment diameter,
length, and valve counts were quantified. Additionally, CD24 and other markers indicating lymphatic valves were investigated using transcriptomic and flow cytometry analyses.

Results:
Post-infection fluorescence microscopy revealed pronounced lymphatic remodeling in the dermis, including increased vessel diameter and altered morphology. Flow cytometry of infected inflamed skin lesions exhibited a significant decrease in the frequency of $CD24^{+}$ lymphatic endothelial cells versus uninfected control tissue. These findings aligned with quantitative imaging data demonstrating fewer lymphatic valves in lesions relative to controls.

Conclusions:
These results support reduced lymphatic valve density in chronic skin infection, which

Submitted by Spencer Hazeslip

may have profound effects on lymphatic function and skin inflammation. Future analysis of blinded human dermal tissue will assess clinical relevance and inform future therapeutic targets.

Submitted by Spencer Hazeslip

ABSTRACT

Introduction: Head and neck cancers are some of the most common types of cancers worldwide. They can critically impact anatomical sites for speech, swallowing, and respiration. Prior studies suggest significantly improved survival outcomes for patients at high-volume academic centers, possibly due to clinical trials access.

Objectives: The goal of this study is to evaluate how clinical trial participation affects survival outcomes for patients with head and neck cancer at an academic institution in a rural state.

Methods: This retrospective cohort study analyzed cancer registry data from a single academic institution between 2010 and 2023. Adult patients (≥18 years) with histologically confirmed head and neck cancer were included, and those with incomplete follow-up were excluded. Patients were classified according to therapy received: clinical trial versus non-clinical trial therapy. Demographics, comorbidities, and cancer status were compared between the two cohorts.

Results: 1,875 patients met inclusion criteria, with 47 patients enrolled in clinical trials. Patients in the clinical trial cohort demonstrated greater survival outcomes even when adjusting for age, race, insurance, cancer stage, tobacco history, alcohol history, and comorbidities ($p=0.028$).

Conclusion: The clinical trial participants in our study had improved survival outcomes despite having higher comorbidity scores when compared to those who did not participate in a clinical trial. These results can be utilized to empower patients diagnosed with head and neck cancer to consider clinical trial participation.

Submitted by Sydney Hibbs

Title: Social Determinants of Health (SDOH) Influencing Vaccine Hesitancy in Arkansas
Authors: Samantha Huang, OMS III and Rajendram Rajnarayanan, Ph.D., FRSPH

Abstract

Background: Vaccine hesitancy presents a significant public health challenge, impacting group immunity and potentially leading to disease outbreaks. This issue is particularly relevant in Arkansas, where only 64.9% of children aged 24 months had received all CDC recommended vaccinations compared to the national average of 71% (America's Health Rankings, 2023). Existing articles emphasize vaccine hesitancy, influenced by factors beyond availability. SDOH—encompassing economic stability, education, healthcare access and quality, neighborhood characteristics, and social context—play a crucial role in health outcomes, including vaccination decisions.

Objectives: To synthesize evidence on how SDOH influence vaccine hesitancy across the Arkansas region and identify common structural, cultural, and access-related factors influencing vaccination decisions.

Methods: A literature review conducted through PubMed, CENTRAL, CDSR, Scopus, and CINAHL using a specific search string using articles within 10 years of July 15, 2024. After screening 40 articles with inclusion criteria, 19 studies met eligibility requirements. Study demographics and key findings from these articles were extracted and organized for analysis.

Results: Individuals facing economic instability may prioritize immediate needs over preventive healthcare. Furthermore, the literature indicates a link between higher education levels and increased vaccine adherence. Additionally, individuals with a primary care provider and a history of regular checkups demonstrate higher vaccination rates, whereas those who forgo healthcare due to cost exhibit elevated vaccine hesitancy.

Conclusion: Addressing vaccine hesitancy in Arkansas necessitates a multifaceted approach that considers SDOH. Interventions should focus on mitigating financial barriers, enhancing health literacy, ensuring equitable access to healthcare, and fostering trust in healthcare providers.

Submitted by Samantha Huang

Background:
Stress exposure has been consistently recognized as a risk factor for chronic medical conditions. Prenatal stress is known to influence general health outcomes, yet its role in immune-related diseases remains unclear. Prior studies have suggested that it may increase autoimmune disorder risk, but this relationship has not yet been investigated. The present study sought to address these gaps by examining associations between prenatal stress exposure and disease diagnoses across two countries.

Objectives:

- Clarify associations between prenatal stress and autoimmune disease risk to help identify prenatal stress as a clinical risk factor.

Methods:
532 adults in the United States (n=203) and Brazil (n=329) were included in the study. Information about prenatal stressor exposure and physician-diagnosed health conditions, including both general health and autoimmune disorders, was obtained. Demographic information and confounds such as socioeconomic status were controlled for in all analyses.

Results:
Each additional prenatal stressor exposure was linked with a 28% increased risk of an autoimmune disorder diagnosis (RR = 1.28, 95% CI 1.09 to 1.47, $p < .001$). Separate analyses explored associations between each prenatal stressor and health outcome, finding that certain prenatal stressors were found to predict more negative health outcomes than others.

Conclusions:
Prenatal stress exposure was associated with a greater burden of general health and autoimmune disorders in adulthood. These findings offer preliminary evidence linking prenatal stressor exposure to autoimmune disorder risk. Understanding these relationships may inform future research and aid clinicians in recognizing high-risk individuals, supporting earlier clinical monitoring practices and prevention.

Submitted by Sarah Khot

Commentary on Maternal Mortality in Arkansas: The Role of Social Determinants of Health in Shaping Outcomes

Sasha Kumar, Anushka Narielwala

Arkansas College of Osteopathic Medicine

Maternal mortality is rising at an alarming rate in the United States, with an even more concerning increase in Arkansas compared to the national average. Significant racial, socioeconomic, and geographic disparities continue to contribute to preventable pregnancy related deaths. While maternal mortality has been widely discussed at the national level, fewer publications have focused specifically on the unique and worsening trends within Arkansas.

This commentary examines maternal mortality in Arkansas using data from the Arkansas Maternal Mortality Review (MMR) Committee Legislative Reports, the Centers for Disease Control and Prevention (CDC), and maternal health-focused nonprofit organizations. National Center for Health Statistics mortality data from 2018–2022 show Arkansas has a maternal mortality rate of 38.3 deaths per 100,000 live births, compared to the national average of 23.2 per 100,000. Disparities are especially severe among Black non-Hispanic mothers, who experience 2.3 times the rate of pregnancy-associated deaths compared to White non-Hispanic mothers, according to the 2023 Arkansas MMR Legislative Report. Additionally, the Arkansas MMR Committee reported that 92% of pregnancy-related deaths were preventable.

These findings highlight how maternal mortality in Arkansas is strongly influenced by social determinants of health, including healthcare accessibility, rural geography, and state-level policy barriers. Together, these compounding factors create an urgent need for action. Strategies should prioritize expanding and strengthening Medicaid coverage, improving prenatal and postpartum care, and addressing the limited availability of maternal healthcare services across the state. Future research should explore region-specific policy impacts and community-level obstetric surveillance to reduce preventable maternal deaths and improve maternal outcomes throughout Arkansas.

Submitted by Sasha Kumar

Delayed Echocardiographic Detection of Infective Endocarditis Despite Early Neurologic Septic Emboli: A Case Report

*[2]Justin Casper, D.O.,[*1]Hayley Creath, [*1]Sasha Kumar, [*1]Anushka Narielwala Arkansas College of Osteopathic Medicine*
Northwest Medical Center

Infective endocarditis (IE) is a life-threatening condition with extracardiac complications, including neurologic septic emboli. Diagnosis relies on clinical suspicion, microbiology, and imaging; however, echocardiographic sensitivity varies by disease stage. This case highlights the diagnostic limitations of early echocardiography in suspected IE.

A 53-year-old woman presented with generalized weakness after recent travel and was previously treated outpatient for streptococcal pharyngitis, urinary tract infection, and pneumonia. On emergency department arrival, she was febrile, tachycardic, tachypneic, and hypotensive, consistent with sepsis, later progressing to septic shock requiring ICU admission. On hospital day two, she developed acute left arm weakness and dysarthria. MRI brain revealed multiple small embolic infarcts consistent with septic emboli, despite a normal initial CT. Initial TTE and TEE showed an atrial septal defect (ASD) but no vegetations, raising concern for paradoxical emboli. However, persistent MSSA Staphylococcus aureus bacteremia and worsening embolic complications prompted repeat TEE on hospital day four, which revealed new mobile tricuspid valve vegetations with tricuspid regurgitation, confirming IE. CT venography demonstrated cavitary nodules and rounded airspace opacities consistent with septic pulmonary emboli.

This case demonstrates that neurologic septic emboli and persistent bacteremia may precede echocardiographically detectable vegetations by several days. The presence of an ASD further complicated interpretation, and reliance on a single early TTE/TEE delayed definitive intervention (tricuspid valve replacement). Early repeat TEE should be strongly considered in high-risk patients with persistent bacteremia or new embolic phenomena to avoid diagnostic delay and improve outcomes.

Submitted by Sasha Kumar

Autonomous Deep Learning for Pediatric Bone Age Estimation Using Historical Atlases

Authors: Samuel Lane, Carson Wood, Samuel Turner, Joshua Gullace, Rajendram Rajnarayanan

Background: Automated bone age assessment using deep learning has shown promise in pediatric radiology. This study investigates image CNN backbones for estimating skeletal maturity from hand radiographs and their relationship to the Greulich and Pyle methodology.

Objectives: To compare the performance of four CNN architectures (DenseNet121, EfficientNetB0, MobileNetV2, and ResNet50) trained with autonomous deep learning on the RSNA Pediatric Hand dataset, and to compare model performance between continuous ages and Greulich and Pyle intervals.

Methods: Four CNN architectures were trained using semi-supervised learning on the RSNA Pediatric Hand dataset to estimate skeletal age. All models were fine-tuned via transfer learning in a custom training pipeline that leveraged autonomous hyperparameter tuning. Performance was evaluated using accuracy, precision-recall, and ROC metrics. Models were compared between two approaches: regression on continuous ages and classification using Greulich and Pyle skeletal age intervals.

Results: Models trained with Greulich and Pyle intervals achieved 1.5 to 2 times higher validation and test accuracies compared to continuous age regression, with improved macro-averaged PR and ROC AUC scores. EfficientNetB0 and ResNet50 showed the greatest improvements.

Conclusion: CNN backbone architectures, particularly EfficientNetB0 and ResNet50, demonstrate significant performance gains when trained on pediatric skeletal age estimation tasks. Structuring training data using clinically established Greulich and Pyle intervals substantially enhances model accuracy. Future work should explore additional data augmentation, hyperparameter optimization, and physical optimizations such as region masking to further improve diagnostic performance across diverse architectural designs.

Submitted by Samuel Lane

Background
Assessment of clinical competence in medical education requires students to integrate communication, clinical reasoning, and decision-making skills under standardized conditions. AI-simulated virtual patient consultations designed to reflect OSCE/C3DO-style encounters may offer a scalable approach to assessment preparation; however, evidence describing performance improvement across repeated encounters during routine curricular implementation remains limited.

Objectives
The study aims to evaluate changes in medical student performance across repeated AI-simulated, OSCE/C3DO-style virtual consultation encounters implemented as part of a pilot program.

Methods
A pilot study was conducted involving 120 fourth-year medical students who completed 16 faculty-assigned AI-simulated virtual patient consultations over four weeks. Each consultation represented a standardized clinical encounter and was scored using predefined performance criteria. Two linear mixed-effects models were fitted: one compared first versus last consultation scores, and the second examined the association between consultation attempt number and performance score. Student identifier was included as a random intercept in both models.

Results
Mean performance scores increased from the first consultation (mean = 56.8) to the final consultation (mean = 79.3) representing a mean improvement of 22.5 points ($p < 0.001$). Mixed-effects modeling demonstrated significant improvement between first and last consultations (estimate = 16.9, $p < 0.001$) and a positive association between consultation attempt number and performance score (estimate = 1.14 points per attempt, $p < 0.001$).

Conclusions
Medical students demonstrated significant performance improvement across repeated AI-simulated, OSCE/C3DO-style virtual patient consultations. These findings support the use of structured AI-simulated consultation programs for assessment preparation and integration into undergraduate medical education curricula.

Submitted by Shadan Roumany

Sensorineural Hearing Loss And Neurocognition In Survivors Of Childhood Cancer: A Meta-Analysis

Tripti Shukla[1], Jennifer E. Schlak[2], Anne Eaton[2]; Lindsay Blake[1], Alicia Kunin-Batson[2], Ellen van der Plas[1]
University of Arkansas for Medical Sciences[1]
University of Minnesota[2]

Background: Various studies have shown that sensorineural hearing loss (SNHL) is associated with neurocognitive impairment among childhood cancer survivors, though prior studies are limited by small sample sizes and inconsistent methods.

Objective: This systematic review and meta-analysis evaluated neurocognitive differences between childhood cancer survivors with and without SNHL.

Methods: Studies were included if they evaluated childhood cancer survivors (diagnosed ≤21 years), were ≥2 years post-treatment, received cranial radiation and/or platinum-based chemotherapy, used neurocognitive tests, and included survivors with and without SNHL. Methods and reporting adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Databases searched included PubMed, Web of Science, Cochrane, Scopus, PsycINFO, and Embase. Study quality was assessed using an adapted Newcastle-Ottawa Scale. We collected study details, authors, neurocognitive tests, sample sizes, and group scores (means and standard deviations [SD]). Pooled mean differences and 95% confidence intervals were calculated using standard scores (mean=100, SD=15) and random effects models.

Results: Of 1,012 records identified, nine studies were included in the analyses, with 503 childhood cancer survivors with s-SNHL and 1,553 survivors without s-SNHL. Compared to survivors without s-SNHL, survivors with s-SNHL scored lower on measures of overall intellectual functioning (MD=-8.1, 95%CI=-10.0,-6.2), verbal reasoning (MD=-9.7, 95%CI=-11.4,-7.9), perceptual reasoning (MD=-6.6, 95%CI=-11.1, -2.1), working memory (MD=-5.3, 95%CI=-7.1, -3.4), processing speed (MD=-6.3, 95%CI=-9.9,-2.6), short-term visual memory (MD=-6.0, 95%CI=-8.2, -3.7), and reading (MD=-6.2, 95%CI=-7.9, -4.5).

Submitted by Tripti Shukla

Conclusions: Severe SNHL is associated with neurocognitive deficits in childhood cancer survivors. Routine hearing screening and timely neurocognitive assessments are recommended to identify and address these impairments.

Submitted by Tripti Shukla

Exploring the Behavioral and Cellular Effects of CMF Chemotherapy: Insights into Learning, Memory, and Hormonal Regulation

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College of Medicine[1], College of Pharmacy[2]
University of Arkansas for Medical Sciences

Background: Breast cancer is one of the most prevalent malignancies worldwide, with approximately 1 in 8 women at risk of diagnosis. Advances in chemotherapy and radiation therapy have increased survival rates to 91%, shifting attention to long-term treatment-related sequelae. Chemotherapy-induced cognitive impairment ("chemobrain") affects memory, attention, and executive function, contributing to anxiety and reduced quality of life. The CMF chemotherapy regimen (cyclophosphamide, methotrexate, and 5-fluorouracil) is widely used; however, its effects on cognition and female reproductive function remain poorly characterized.

Objective: This study examined short- and long-term effects of CMF chemotherapy on cognition and the hypothalamic–pituitary–ovarian axis.

Methods: Two cohorts of three-month-old female C57BL/6 mice received weekly CMF injections (60 mg/kg cyclophosphamide, 4 mg/kg methotrexate, 60 mg/kg 5-fluorouracil) on days 1, 8, 15, and 22. Cohort 1 underwent Y-Maze and Morris Water Maze testing 24 hours after the final injection, while Cohort 2 was tested 30 days later. Following sacrifice, serum, brain, hypothalamus, pituitary, and ovaries were collected. Ovarian gene expression was analyzed by qPCR, reproductive hormones by ELISA, and hippocampal proteomics assessed cellular function.

Results: CMF-treated mice in Cohort 1 demonstrated impaired short-term and spatial memory in behavioral testing. FSH and LH levels were reduced in both cohorts, indicating pituitary suppression. ZAR1 and YAP1 expression decreased transiently in Cohort 1 but normalized in Cohort 2, while ovarian gene expression remained unchanged.

Conclusion: CMF chemotherapy induces transient cognitive deficits and suppresses pituitary hormone signaling, suggesting reversible disruption of neuroendocrine regulation that may

Submitted by Tripti Shukla

contribute to chemobrain and reproductive dysfunction.

The Association Between Uveitis and Optic Neuritis in Central Nervous System Demyelinating Disorders: A Multi-Institutional Cohort Study

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Financial Disclosures: None

BACKGROUND

- Optic neuritis (ON) is a common manifestation of central nervous system (CNS) demyelinating diseases, including multiple sclerosis (MS), neuromyelitis optica spectrum disorder (NMOSD), and myelin oligodendrocyte glycoprotein antibody–associated disease (MOGAD).[1,2]
- Uveitis and ON share overlapping immune-mediated mechanisms and may co-occur in demyelinating disease.[1]
- Large-scale data evaluating the risk of uveitis following ON in CNS demyelination are limited.
- **Objective**: To evaluate the 5-year incidence of uveitis in patients with CNS demyelinating disease with and without ON.

METHODS

- **Design**: Retrospective, multicenter cohort study using the TriNetX Collaborative Network.
- **Cohort Construction**: Three propensity-matched cohorts were assembled: (1) overall CNS demyelinating disease, (2) MS, and (3) combined NMO/MOGAD—each stratified by presence or absence of ON.
- **Statistical Analysis:** One-to-one propensity score matching was performed; 5-year cumulative incidence was estimated using time-to-event analyses, with hazard ratios (HRs) and 95% confidence intervals (CIs) reported.

RESULTS

- Patients with CNS demyelinating disease and ON had a significantly higher 5-year cumulative incidence of uveitis compared with matched patients without ON (1.09% vs 0.61%; HR 1.99, 95% CI 1.57–2.52; *P*<0.0001) (**Table 1**).
- Across the overall CNS demyelinating disease cohort, intermediate uveitis demonstrated the strongest association with ON (**Table 1**).
- The association persisted in the MS cohort (HR 1.95, 95% CI 1.51–2.53); trends were similar but not statistically significant in the NMO/MOGAD cohort.

Table 1. Measures of Association Between Uveitis and Patients with Central Nervous System Demyelinating Disease With and Without Optic Neuritis

	With Optic Neuritis			Comparison			Log Rank Test P	Hazard Ratio (95% CI)
Outcome	Patient Cohort	Patient Outcome	Cumulative Incidence (95% CI)	Patient Cohort	Patient Outcome	Cumulative Incidence (95% CI)		
Any uveitis	25,756	210	1.09 (0.950-1.25)	25,903	104	0.610 (0.501-0.743)	<0.0001	1.99 (1.57-2.52)
Anterior	25,799	143	0.755 (0.638-0.892)	25,903	75	0.435 (0.345-0.548)	<0.0001	1.87 (1.42-2.48)
Intermediate	25,872	50	0.274 (0.207-0.364)	25,903	13	0.081 (0.046-0.143)	<0.0001	3.77 (2.05-6.93)
Posterior/Panuveitis	25,862	80	0.406 (0.325-0.508)	25,903	32	0.192 (0.135-0.274)	<0.0001	2.45 (1.63-3.69)

CONCLUSIONS

- ON is associated with an approximately twofold increased risk of subsequent uveitis in patients with CNS demyelinating disease.
- Intermediate uveitis shows the strongest relationship with ON, supporting shared inflammatory mechanisms.[3,4]
- ON represents a clinically meaningful risk marker for uveitis.
- These findings support proactive ophthalmic surveillance and close neurologic–ophthalmologic collaboration.

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Evaluation of laboratory screening guidelines for occult abdominal trauma in child physical abuse

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BACKGROUND

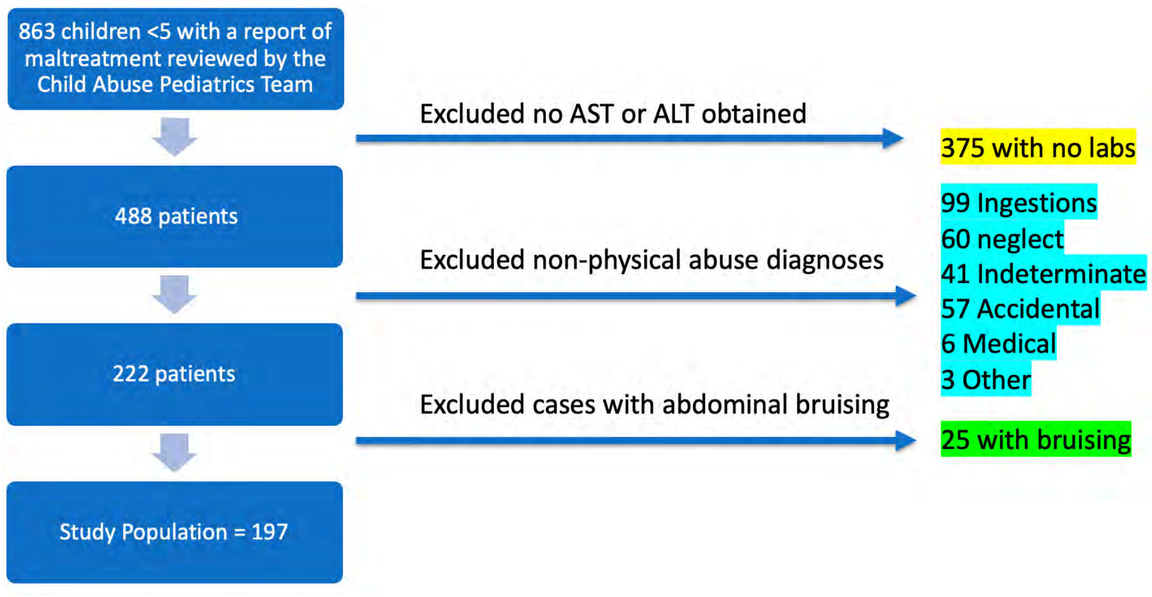
- Abusive abdominal trauma is a leading cause of death in physically abused children.
- Early signs can be nonspecific (ie. tenderness) or there can be an absence of external signs of injury (ie. bruising).
  - Screening upon initial evaluations is critical
- Older literature suggests:
  - If AST or ALT are >80 IU/L → Abd. CT w/ contrast
- Newer literature:
  - If AST >125 IU/L or ALT >200 IU/L → Abd. CT w/ contrast
  - Limitations of newer literature: poor compliance of obtaining CTs and varying definitions of "occult injury"

OBJECTIVES

- **Aim 1:**
  - Evaluate the diagnostic yield of abdominal imaging for evaluation of pediatric physical abuse when AST or ALT are >80.
- **Aim 2:**
  - Determine sensitivity and specificity of varying thresholds of AST and ALT levels.

METHODS

- Single children's hospital network (ACH and ACNW)
- Retrospective review of maltreatment cases of children <5 years of age from January 2022 – May 2025 reviewed by the child abuse pediatrics team



RESULTS

- 197 patients total
- 41 (21%) with AST or ALT >80
  - 38 (92.7%) had an abd. CT w/ contrast obtained
  - **10 (24.4%) with occult Torso Trauma**
- Under current guidelines: All 10 patients were identified
- Under new proposed guidelines: 6 patients were identified
- Utilizing a cutoff of 80 for AST or ALT yielded a sensitivity of 90% and a specificity of 85%.
- As the threshold increased sensitivity declined
  - Sensitivity 80% when AST or ALT >100
  - Sensitivity 60% when AST or ALT >125

Table 1: Potentially Missed Cases under New Guidelines

Age	AST and ALT values	Occult CT findings
2 months	AST: 86, ALT:32	Pulmonary contusion
3 months	AST: 108, ALT: 99	9th rib fracture
4 months	AST: 66, ALT: 189	9th rib fracture
2 years	AST: 101, ALT: 58	Vertebral compression fracture

Table 2: Sensitivity/Specificity when AST or ALT >80.

Sensitivity and Specificity				
Statistic	**Estimate**	**Standard Error**	**95% Confidence Limits**	
Sensitivity	0.9000	0.0949	0.7141	1.0000
Specificity	0.8546	0.0234	0.8088	0.9005
Positive Predictive Value	0.2143	0.0633	0.0902	0.3384
Negative Predictive Value	0.9949	0.0051	0.9848	1.0000

LIMITATIONS

- Single-institution study and small sample size limits generalizability
- Reliance on existing medical records may mean some data is missing, poorly documented, or incorrect

DISCUSSION & CONCLUSIONS

- Our study identified
  - Optimal sensitivity and specificity with AST or ALT>80
  - Several isolated, occult torso trauma findings seen solely on advanced imaging in patients with minimally elevated AST or ALTs
- We recommend caution and further study prior to adjusting screening guidelines for evaluation of clinically occult injury in suspected child physical abuse cases.
- Potential future studies: Diagnostic yield of chest CTs in additional to abdominal CT for possible occult chest trauma.

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SETD2 inhibition enhances γH2AX foci formation in KRAS-mutant colorectal cancers

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Background: KRAS mutations in colorectal cancers augment cell proliferation, impair differentiation, and suppress apoptosis, thereby conferring poorer prognoses and increased resistance, making them a particular concern. Our preliminary data suggests that, among these other effects, KRAS mutations can upregulate the histone methyltransferase SETD2 in KRAS-mutant colorectal cancers, therefore establishing a regulatory connection between KRAS and SETD2. Significantly, SETD2 adds a third methyl group to lysine 36 of histone H3 (H3K36me3), a histone modification essential for DNA damage repair and important for cellular response to ionizing radiation. Furthermore, alterations to levels of H3K36me3 are associated with reduced sensitivity to radiation in KRAS-mutant colorectal cancers.

Objectives: We seek to determine if targeting SETD2 enhances radiosensitivity in KRAS-mutant colorectal cancers.

Methods: To investigate the role of H3K36me3 in response to ionizing radiation (IR), we performed γH2AX foci immunofluorescence analysis of DNA damage response proteins on two human KRAS-mutant colorectal cancer cell lines (LoVo & HCT116). The cells were treated with EZM 0414, a specific SETD2 inhibitor.

Results: Our investigations revealed an increase in DNA damage, as indicated by the upregulation of γH2AX foci detected by immunofluorescence, in cells treated with radiation and EZM 0414 compared to radiation treatment alone.

Conclusion: This data is consistent with a role of SETD2 in DNA repair, which suggests it could be pharmacologically targeted in KRAS-mutant rectal cancer patients receiving radiotherapy. Therefore, these findings suggest SETD2 may serve as a promising target for treatment of colorectal cancers, offering a potential way to improve management of radiation resistance.

Submitted by Zoe Rodrigues