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October 21, 2026

Abstract Booklet

MICHIGAN STATE UNIVERSITY | College of Human Medicine

LIVE VIRTUAL PRESENTATIONS

October 21st, 2026

1:00-3:00pm

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Title: Even the Machines Disagree: CPT Coding Variability in Craniofacial Surgery Presents in Large Language Models

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Background

Accurate Current Procedural Terminology (CPT) coding supports appropriate reimbursement and consistent reporting of surgical procedures. In craniofacial surgery, the limited availability of procedure-specific codes may contribute to variability in coding practices. As large language models (LLMs) are increasingly explored for applications in medical billing, their performance in procedures without a single, clearly defined CPT code remains understudied. This study evaluates the precision and consistency of independent LLMs in generating CPT codes for craniofacial procedures and explores their potential utility in supporting standardized code selection.

Methods

An observational study evaluated the performance of four LLMs (ChatGPT, Claude, OpenEvidence, and Gemini). De-identified operative dictations from 18 craniofacial procedures were submitted to each model using a standardized prompt: “Please provide the appropriate 2026 CPT code for...” followed by the operative dictation. Primary and additional CPT codes generated by each model were recorded, along with modifier recommendations when provided.

Results

The four LLMs reached unanimous agreement on the primary CPT code for 7 of 18 (38.9%) craniofacial procedures, all of which had well-defined CPT codes. For cleft lip repair, all models selected the same primary code but differed in whether an adjunctive rhinoplasty code was included when applicable. Double-opposing Z-plasty palatoplasty resulted in three different primary CPT codes across the four models. Among cranial vault procedures, three of four models selected a craniofacial-specific code for fronto-orbital advancement. Differences in the inclusion of additional codes, including temporalis flap, occlusal splint, bone graft harvest, and adjunctive rhinoplasty code, occurred in 6 of 18 cases (33.3%), with Claude and Gemini more frequently providing additional codes.

Conclusions

LLMs demonstrated consistency in CPT selection when well-defined procedure codes are present, while variability increased for procedures with less clearly defined coding pathways. These findings suggest that current LLMs may have limited utility for independent CPT code selection in craniofacial surgery, particularly when coding requires interpretation or selection among multiple potential codes. As artificial intelligence is increasingly incorporated into medical billing, including coding queries after surgeon selection, efforts to clarify and standardize coding for craniofacial procedures are needed to avoid undervaluation of specialized procedures.

Drinking Water Contaminants as Biologically Plausible Drivers of Colorectal Cancer Pathogenesis

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Background: Colorectal cancer (CRC) incidence is rising in selected populations despite expanded screening, suggesting that exposures beyond detection may contribute to disease burden. Drinking water is a continuous, population-wide exposure pathway, but its role in CRC pathogenesis remains underexamined. This review evaluated whether common drinking water contaminants are biologically plausible contributors to CRC and identified mechanisms and research gaps relevant to future causal studies.

Methods: A narrative literature review was conducted using peer-reviewed epidemiologic, experimental, biomarker, metabolomic, and microbiome studies focused on nitrate/nitrite, disinfection byproducts, toxic metals, and microbial pollutants in relation to CRC or CRC-relevant carcinogenic pathways. Evidence was organized by contaminant class, study type, exposure metric, CRC outcome or surrogate endpoint, proposed mechanism, host-susceptibility factor, and limitations in exposure assessment or causal inference.

Results: Nitrate and disinfection byproducts remain the most consistently studied water contaminants in relation to CRC. Nitrate exposure may promote carcinogenesis through endogenous formation of N-nitroso compounds, inducing DNA damage and genomic instability. These effects may be amplified by conditions that enhance nitrosation, including high intake of red or processed meat and reduced antioxidant availability. THMs are increasingly implicated in biologic pathways beyond direct toxicity. Human biomarker and metabolomic studies link THM exposure with inflammatory cytokines, angiogenic mediators, and altered nicotinamide, cytochrome P450, and tyrosine metabolism, suggesting chronic low-dose exposure may affect tumor microenvironment formation, xenobiotic metabolism, and redox regulation.Toxic metals and microbial pollutants broaden the concept of water-related CRC risk. Arsenic and chromium have demonstrated tumor-promoting effects in colitis-associated animal models through reactive oxygen species generation, oxidative DNA injury, impaired antioxidant defenses, and Wnt

BALANCING RISK AND RELIEF: THORACIC EPIDURAL USE IN LIVER TRANSPLANTATION

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Background: Patients usually spend one to three days in the intensive care unit following a liver transplant. Post-operative pain is typically described as moderate to severe in the first few days, particularly around the large incision site. Transversus abdominis plane blocks, abdominal wound catheters, or thoracic epidurals may be used for targeted pain relief, depending on clotting profiles. While a thoracic epidural offers superior pain control, the risk of developing epidural hematoma in cirrhotic patients with impaired coagulation limits its routine use. Also, higher rates of abscess and nerve injury are associated with chronic liver disease.

Case Presentation: 21 years old male received a liver transplant due to liver disease. Past medical history is significant for X-linked erythropoietic protoporphyria complicated by hepatic cirrhosis and ascites as well as anemia, leukopenia, and thrombocytopenia. Other comorbidities included acute pancreatitis, dysuria, chronic and neuropathic pain. Patient is non-English speaking. Three days after the surgery patient underwent an epidural catheter placement for post-operative pain management. Patient monitoring included EKG, continuous capnography, continuous pulse ox and blood pressure. Midline approach was used. Location was at T7-8. Spring wound catheter was used. Medications administered: 0.125% bupivacaine at 8 ml every 1 hour, then the rate was increased to 10 ml every 1 hour. After the rate increase to 10 ml the patient was satisfied with the pain level and was able to eat and ambulate. Epidural was removed 6 days later.

Conclusion: Thoracic epidural analgesia can be effectively used for postoperative pain management after liver transplantation. Research has shown that an epidural containing a local anesthetic, with or without the addition of an opioid, decreases pain after a major abdominal surgery and accelerates the return of gastrointestinal transit. The benefits of the epidural: it provides superior pain control compared to intravenous opioids, reduces the need for systemic opioids and helps in avoiding sedation and reducing pulmonary complications. An important consideration in liver transplant patients is hepatic coagulopathy-related increased risk of inducing epidural hematoma. Coagulation profile should be checked before epidural placement. Another consideration is that epidurals might cause urinary retention and a decreased urge to urinate, so a patient requires a urinary catheter while epidural is in place.

Title

Moving Beyond Screening: An Equity-Centered Framework for Pediatricians to Advance Youth Suicide Prevention

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Background

Youth suicide remains a leading cause of death among children and adolescents in the United States, with disproportionate burdens among populations affected by adverse childhood experiences (ACEs), historical trauma, structural inequities, disability, rural residence, and barriers to mental health care. While universal suicide screening and risk assessment are essential components of pediatric practice, they primarily identify youth already at risk and may miss opportunities for upstream prevention.

Methods / Framework Development

Building upon the Social-Ecological Model and the American Academy of Pediatrics Blueprint for Youth Suicide Prevention, this review presents an equity-centered conceptual framework that positions pediatricians as leaders in suicide prevention across clinical, school, community, and policy settings.

Results / Key Findings

The framework emphasizes addressing upstream determinants of mental health—including trauma, social determinants of health, discrimination, and limited access to care—while strengthening protective factors such as family and school connectedness, cultural identity, trusted adult relationships, emotional coping skills, and community engagement. It further highlights four interconnected domains for pediatric advocacy:

- Trauma-informed and culturally responsive clinical care
- School partnerships
- Community collaboration
- Policy initiatives that improve access to behavioral health services and promote safe environments

Conclusion

By shifting the focus from crisis response to resilience building, this framework illustrates how pediatricians can advance equitable, population-level suicide prevention strategies and reduce disparities while improving the mental health and well-being of all children and adolescents.

From Diagnosis to Research Readiness: A Parent-Led Implementation Model for Primrose Syndrome

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Background: Primrose syndrome is an ultra-rare, multisystem neurodevelopmental disorder caused by pathogenic variants on the gene *ZBTB20 (located at 3q13.31)*. Features include developmental, intellectual, and behavioral disabilities; macrocephaly; central nervous system abnormalities; seizures; hearing and vision impairment; skeletal and craniofacial differences; and endocrine, metabolic, and immune complications. The severity and combination of symptoms vary widely. Families report isolation, fragmented care, limited access to knowledgeable clinicians, and few coordinated opportunities to participate in research. Although resource platforms for genetic conditions such as Primrose syndrome exist, the lack of consolidated and up to date evidence create barriers to quality care and information for both patients and families affected.
Methods: Here we describe how a newly formed parent-led organization built a community and research-readiness infrastructure for Primrose Syndrome while integrating family articulated priorities with multidisciplinary scientific oversight. This is a retrospective descriptive implementation assessment of Beyond Primrose ZBTB20 Foundation activities from November 2025 through September 2026 was conducted. Activities and completed or initiated milestones were mapped across five domains: community engagement, governance, education and support, data infrastructure, and translational research. Outputs and time -to milestone- were summarized descriptively.
Results: Within 9 months, the initiative connected 88 affected families worldwide through a secure contact registry and established recurring virtual meetings. A centralized website was launched with information on Primrose syndrome, supportive care and surveillance, specialists, research participation, caregiver and sibling support, and financial and travel assistance. More recently, a communication platform has been implemented to allow families direct support and share experiences to better guide patient care. Research-readiness milestones included initiating an international, institutional review board-approved longitudinal natural history registry incorporating standardized measures; work to identify potential biomarkers; and establishing two complementary drug-repurposing collaborations using patient-derived fibroblast and RNA-based approaches, including a sibling control.
Engagement within the foundation has allowed for the development and planning of an “Innovation Summit” to allow affected families to gather and discuss their personal experiences, while also deepening their understanding of the clinical therapies available by hearing from knowledgeable providers of the field. The summit also presents a unique opportunity to provide families with the option of additional genetic testing to potentially provide families with more insight into genetic transmission and clinical treatment. Together, these efforts created coordinated pathways for community support, education, data contribution, biospecimen donation, functional studies, and therapeutic development.
Conclusions: A patient-led organization can build measurable research-readiness infrastructure on a compressed timeline when community engagement, multidisciplinary governance, education, data systems, and translational partnerships are developed in parallel. Consolidation of literature and data, along with lived experience, allows family utilization when communicating with providers is essential to producing therapeutically favorable outcomes globally. Additional gathering of lived experience data via discussion and surveys allow for a more objective understanding of individual impacts on treatments and outcomes, particularly due to the variation of presentation in each individual patient. Future evaluation should measure participation, representativeness, stakeholder experience, disease burden, and longitudinal outcomes.

POSTER ABSTRACTS

CASE REPORTS

Building Trust with a Patient Utilizing Complementary and Alternative Medicine

1. Katherine Bekker, Michigan State University, College of Human Medicine
2. Elizabeth Nisper, MD, Corewell Health, Butterworth Hospital

Complementary medicine is defined as an addition of nontypical medical approaches to conventional medicine, while alternative medicine *replaces* conventional therapies. The use of complementary and alternative medicine (CAM), has increased globally in recent years, suggesting a need for further investigations into their health effects and medication interactions. Furthermore, CAM, particularly alternative measures, are major topics of medical misinformation and disinformation, potentially eroding trust between the patient and their health teams. Thus, research into why patients turn to CAM and how healthcare workers can build trust with patients who use CAM, is important.

This case presents a young adult woman with no significant past medical history who presented to the ED with chest pain, productive cough, shaking and syncope with collapse. She was tachycardic and hypertensive on presentation and imaging showed a left lower pneumonia and bacterial sinusitis without concern for neurological involvement. After admission, the patient disclosed using multiped CAMs, including chlorine dioxide, hydroxychloroquine, ivermectin, methylene blue, and multiple unspecified homeopathic remedies. She disclosed further symptoms including diarrhea, discolored urine, and lightheadedness, which began when she started the alternative therapy.

Within the month following discharge, she came to the ED 7 more times, mostly with headaches and seizure-like activity, which was eventually diagnosed as migraines with psychogenic non-epileptic seizures, possibly exacerbated by extreme familial stress. The patient was placed in the care of a multidisciplinary team including social workers, psychiatrists, psychologists, neurologists, and her primary care doctor. Her care is on-going, focusing on mental health care, migraine control, anxiety management, and psychogenic seizure monitoring.

This case illustrates the vitality of non-judgmental, systematic approaches when caring or patients who use CAM, particularly those who turn to alternate therapies due to perceived ineffectiveness or dismissiveness from the healthcare system. Because CAM can exert real pharmacological effects, cause direct toxicity, and interact with prescription drugs, undisclosed use, a common consequence of a poor patient-provider relationship, is a genuine safety hazard. This patient had multiple risk factors for utilizing alternative therapies and required a non-judgmental approach alongside frequent visits with her care team to find effective therapies and management modalities.

Bilateral Accessory Psoas Tertius Muscles and Interactions with the Femoral Nerve: A Case Report of an Adult Male Cadaver

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Introduction

The psoas muscle group typically consists of the psoas major and the psoas minor. The psoas major attaches to the vertebral bodies and transverse processes at levels T12-L5 and inserts at the lesser trochanter of the femur via the iliopsoas tendon. The psoas minor is variably present, with reported prevalence of approximately 65%. The psoas minor runs medially and anteriorly to the psoas major, attaching to the vertebral bodies of T12 and L1 and inserting at the iliopubic ramus. The psoas tertius is a rare accessory muscle with variable anatomy that may join with the iliopsoas tendon to insert at the lesser trochanter of the femur.

The femoral nerve, a branch of the lumbar plexus, is composed of the posterior divisions of the ventral rami of L2-L4. The femoral nerve forms and travels within the psoas major muscle and emerges at its lateral border in the iliac fossa. It then passes beneath the inguinal ligament to innervate muscles of the anterior compartment of the thigh. However, if the psoas tertius is present, the accessory muscle may pierce and split the femoral nerve as the muscle travels distally and joins with the iliopsoas tendon. The psoas tertius may have clinical implications for femoral neuropathy, symptoms mimicking lumbar radiculopathy, and potential femoral nerve entrapment.

Methods

This anatomical variation was identified during a prosection elective course at the Michigan State University College of Human Medicine. The cadaver was a 97-year-old male with a medical history significant for hypertensive heart disease, congestive heart failure, and diabetes. Bilateral psoas tertius muscles were identified during cadaveric dissection.

Results

The male cadaver was found to have bilateral psoas tertius muscles. The left psoas major, minor, and tertius were removed to expose surrounding nervous structures. The right psoas major, minor, and tertius were kept intact to preserve the accessory structure and to show the integration with other surrounding structures. Both psoas tertius muscles pierced and split the femoral nerve within the iliac fossa before joining to the iliopsoas tendons.

Discussion and Significance

The psoas tertius is a rare anatomical variation with few documented cases. The accessory muscle possesses the potential to alter the course of the femoral nerve and, consequently, its function. This case demonstrates this through the bilateral piercing and splitting of the femoral nerves. This finding is clinically relevant as the psoas tertius, though rare, may contribute to femoral neuropathy, nerve entrapment, or symptoms mimicking lumbar radiculopathy.

Title: Anesthetic Management for Cesarean Delivery in Suspected Uncharacterized Spinal Dysraphism

Authors: Amita Dutt MS2, Will Kurtz, MD

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Abstract:

Spina bifida is a congenital spinal dysraphism that can present challenges for neuraxial anesthesia during cesarean delivery due to altered vertebral and spinal cord anatomy. Although neuraxial anesthesia has been successfully performed in patients with spina bifida, management should be individualized based on clinical presentation and spinal anatomy. We report a parturient with an uncharacterized history of spina bifida whose uncertain spinal anatomy influenced anesthetic decision-making despite previous successful spinal anesthesia.

The patient's medical record was retrospectively reviewed for relevant clinical and anesthetic information. All protected health information was de-identified. As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per Corewell Health policy. Patient informed consent was obtained for submission of this case report.

A 28 year old woman with a self reported history of spina bifida presented for an elective cesarean delivery. Her diagnosis had been made incidentally by a physician abroad, however the type and extent of abnormality were unknown. She had never undergone treatment and reported no history of neurologic symptoms or deficits. She reported two previous uncomplicated spinal anesthetics for a previous cesarean section and cholecystectomy. Due to a language barrier, limited historical information, and the absence of prior imaging or operative records from another country, her spinal anatomy could not be adequately characterized. Because her history was identified on the day of surgery, she had not undergone neurology or anesthesia consultation before delivery.

Physical Examination revealed a prominent lumbosacral hair tuft, raising concern for spinal dysraphism and possible tethered cord. Because a low-lying or tethered cord could not be excluded, a safe lumbar insertion level could not be confidently identified. Neuraxial anesthesia was deferred, and cesarean delivery proceeded under general anesthesia with endotracheal intubation. Bilateral transversus abdominis plane blocks were performed for postoperative analgesia. The postoperative course was uncomplicated.

Although successful neuraxial anesthesia has been reported in patients with spina bifida, abnormal spinal anatomy may complicate neuraxial techniques and increase the risk of neurologic injury. This case highlights anesthetic decision-making when spinal dysraphism is uncharacterized. Prior successful spinal anesthesia does not establish normal spinal anatomy, particularly when physical examination findings suggest underlying dysraphism. Early anesthetic evaluation may facilitate characterization of spinal anatomy and allow individualized assessment of the feasibility of neuraxial anesthesia before delivery.

Title: Exploring Risk Factors and Rehabilitative Care for Aspiration Pneumonia After Oropharyngeal Carcinoma Treatment: A Case Report and Literature Review

Author(s): Eidy, Zeinab[1] and Patel, Chintankumar, DO[2]

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Background:
Oropharyngeal squamous cell carcinoma may occur in the posterior one-third of the tongue. Various risk factors may impact risk, including but not limited to human papillomavirus (HPV), smoking, family history, and more. This cancer is commonly treated with surgery, chemotherapy, and radiation therapy. Due to the nature and location of the cancer, complications post-treatment may arise, such as aspiration. This report analyzes a 90-year-old female patient with a past medical history of oropharyngeal squamous cell carcinoma. The patient presented to the emergency room almost 10 years later, experiencing severe aspiration pneumonia in addition to atrial fibrillation with rapid ventricular response (RVR). In this case report, we identify risk factors for developing complications and review current literature that examines the outcomes of targeted rehab and swallowing exercises to improve health.

Case Report:
The patient is a 90-year-old female with a past medical history of oropharyngeal carcinoma in the posterior one-third of the tongue that was biopsied and treated with chemoradiation therapy without recurrence. The patient presented almost 10 years later with severe aspiration pneumonitis. She received an X-ray demonstrating lower lobe opacities bilaterally and was considered to be developing pneumonia. Videofluoroscopy swallow studies highlighted significant residual fluid in the valleculae, even after multiple attempts at swallowing. She has elected to work with a speech pathologist practicing teach-back of lingual press, effortful swallow, Mendelsohn maneuver, and rehab education to prevent further exacerbations.

Discussion:
Current literature reports age as a significant risk factor and positive outcomes in studies analyzing individualized rehabilitative care for patients with oral malignancies. Specifically, one study reviewed 29 published manuscripts to examine pre-rehabilitative programs, their timing, and the exercises included. Based on their paper, the authors found that increased exercise of 10 repetitions three times a day was recommended. Additionally, the study found that increased adherence to the exercises had better outcomes. Other important implications of the study include the significance of multidisciplinary care between otolaryngologists, medical oncologists, and speech pathologists in the treatment and management of oral malignancies as well as preventing future exacerbations.

Conclusion:
Complications and impacts on swallowing may arise following treatment and radiation to the neck. Current literature supports standard treatment, which may vary depending on the patient, with increased discussion of rehabilitative care to decrease the risk of complications and improve health outcomes.

When Back Pain Isn't Just Back Pain: Spinal Epidural Abscess in an Unhoused Woman With IV Drug Use History

Jenny Haely, Tom Peterson MD, Jeffrey Jones MD

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Introduction: Spinal epidural abscess (SEA) is a rare but potentially devastating spinal infection in which delayed diagnosis can lead to permanent neurologic injury or death. Back pain is common and often nonspecific, while fever and focal neurologic deficits may be absent early, making SEA easy to miss in emergency department (ED) patients with seemingly benign presentations. Intravenous drug use (IVDU) is a major risk factor, yet reliance on "red flag" symptoms and reassuring examinations can contribute to diagnostic anchoring and delay.

Patient Description: A 38-year-old unhoused woman with prior intravenous heroin use and chronic low back pain presented four times over 10 days to three EDs for worsening back pain. Initial visits showed normal vitals, intact neurologic exams, no spinal tenderness, and unremarkable labs; she was repeatedly diagnosed with musculoskeletal pain, and inflammatory markers were not obtained. On the fourth visit, she arrived in septic shock with leukocytosis, lactic acidosis, pulmonary nodules concerning for septic emboli, and positive blood cultures for *Staphylococcus aureus*; MRI revealed an extensive cervicaltolumbar dorsal spinal epidural abscess.

Interventions: Management included early broad-spectrum intravenous antibiotics for septic shock once septic emboli were suspected, followed by targeted therapy after *S. aureus* was identified. Surgical teams deemed decompression futile given diffuse disease and delayed presentation, and despite prolonged intravenous antibiotics, mechanical ventilation, and tracheostomy, she died three months later from complications of systemic infection and multiorgan failure.

Conclusions: This case illustrates how SEA in a patient with IVDU can be repeatedly overlooked when clinicians rely on normal neurologic examinations and absence of classic red flags to exclude serious spinal infection. It underscores the importance of recognizing IVDU as a persistent highrisk feature, obtaining inflammatory markers, and maintaining a low threshold for contrastenhanced MRI in highrisk patients with recurrent back pain, even when early findings are reassuring. Earlier consideration of SEA might have limited disease extent and preserved neurosurgical options; future work should focus on decision tools that integrate risk factors to guide imaging in ED patients with back pain.

Title: Superior Sagittal Sinus Obstruction as a Complication of Posterior Vault Distraction Osteogenesis: Successful Reversal with De-Distraction

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Background:

Posterior vault distraction osteogenesis (PVDO) is commonly performed for craniocerebral disproportion associated with craniosynostosis, given its ability to achieve substantial intracranial volume expansion and reduce venous outflow obstruction. While its risk profile generally consists of infection, poor wound healing, and cerebrospinal fluid leaks, serious venous complications are rare and incompletely characterized. Furthermore, successful treatment with de-distraction represents a management strategy that has not been well described.

Methods:

A retrospective review of the patient's medical records was performed.

Results:

A 15-year-old female presented with CVST of the right transverse, sigmoid, and proximal internal jugular venous sinuses secondary to mastoiditis. Failed recanalization following antibiotic treatment, anticoagulation, and mastoidectomy ultimately progressed to refractory intracranial hypertension, manifested by headaches, papilledema with vision changes, and sixth nerve palsy. Treatment failure resulted in ventriculoperitoneal shunt placement, requiring four shunt revisions for shunt failure and worsening of symptoms. Recurrent shunt failures were later attributed to slit ventricle pathology and craniocerebral disproportion for which PVDO was performed. Distraction proceeded to 29 mm over four weeks but was complicated by an epidural hematoma and narrowing of the superior sagittal sinus at a bony step-off. This prompted urgent de-distraction and early removal of one distractor. Her course was further complicated by two additional shunt revisions and wound dehiscence requiring surgical debridement six weeks postoperatively. Remaining hardware was removed four months later once new bone formation was confirmed at distraction sites.

Conclusion:

This case represents a novel management strategy of de-distraction in the setting of superior sagittal sinus obstruction following PVDO. In patients with pre-existing venous sinus pathology, bony changes at the distraction site can directly compromise the sinus itself, a complication not encountered in standard PVDO candidates. Close radiographic surveillance and a low threshold to de-distract were essential to identifying and safely managing this complication.

Acute Pelvic Pain Revealing Bilateral Ovarian Serous Cystadenomas in an Adolescent

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Background: Serous cystadenomas are benign epithelial ovarian tumors commonly diagnosed in reproductive-aged women, but are rare in pediatric patients. Bilateral involvement is especially uncommon in adolescents with very few cases reported in the literature. Due to their rarity, these lesions may be difficult to diagnose and manage when identified in children and adolescents.

Case Presentation: A 12-year-old female presented with a one-week history of pelvic pain and dysuria. Physical examination demonstrated suprapubic and RLQ minimal tenderness without palpable abdominal or pelvic masses. Pelvic US demonstrated large bilateral multicystic ovarian masses with corresponding volumes of 93.1 and 312 mL, without torsion, concerning for ovarian neoplasms. There was no leukocytosis with LDH, ß-hCG, AFP, CA-125, CEA and TSH within normal limits. The patient subsequently underwent exploratory laparotomy with left salpingoophorectomy the following day which was tolerated well. Pathology results were positive for serous cystadenoma of the left ovary. Post-operatively anti-mullerian hormone was detected in the right ovary suggestive of viable tissue with normal FSH. Due to concerns for cystic invasion of the remaining ovary, right ovarian cystectomy with debulking of multiple cysts and detorsion was performed two months later. Pathology results also demonstrated serous cystadenoma of the right ovary. The patient is now awaiting repeat pelvic US in 6 months.

Discussion: The treatment of pediatric adnexal masses requires balancing the importance of preserving future reproductive function with the risk of malignancy. Due to the rarity of bilateral serous cystadenomas in children and adolescents, they are often diagnosed later in the disease course. In this case, the patient's symptoms were nonspecific and could easily have been attributed to more common gastrointestinal or gynecologic conditions. This case emphasizes the value of comprehensive imaging, multidisciplinary evaluation, and fertility-spring surgical management when possible.

Conclusion: Bilateral serous cystadenomas, although rare, can occur in adolescents and may present with acute, nonspecific symptoms. Early recognition and timely surgical management are important to optimize outcomes while preserving ovarian function and future fertility.

Primary Villar's Nodule Mimicking an Umbilical Cystic Lesion: An Unusual Presentation

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Background: Villar's nodule is a rare manifestation of primary umbilical endometriosis that may present as a painful umbilical lesion with cyclical symptoms. It accounts for approximately 0.5%-1% of all extrapelvic endometriosis cases. Due to its rarity, it is often misdiagnosed, resulting in delayed treatment. This case report will describe the clinical presentation, diagnostic workup, and management of Villar's nodule in a 25-year-old female patient.

Case Presentation: We report the case of a 25-year-old female who presented with a painful cystic-like lesion on the umbilicus that was initially presumed to be infectious in origin. The patient was first evaluated in an urgent care setting and subsequently in the emergency department, where the lesion was treated as an abscess with antibiotics. Three weeks later, she presented to a general surgery clinic, where the lesion was incised and drained. Following recurrence three months later, she underwent definitive surgical excision. Complete surgical excision of the 5x10mm cystic mass was performed. Histopathologic analysis demonstrated several foci of endometrial glands and surrounding endometrial stroma, consistent with the diagnosis of Villar's nodule. Postoperatively, the patient experienced complete resolution of symptoms with no evidence of recurrence at two-week follow-up.

Discussion: Given its rarity and nonspecific presentation, Villar's nodule remains an underrecognized cause of umbilical lesions in women of reproductive age. This case highlights the importance of maintaining a high index of suspicion even in the absence of prior abdominal surgery. Early diagnosis and surgical excision are essential for definitive management and symptom resolution.

Conclusion: Villar's nodule should be considered in the differential diagnosis of painful umbilical lesions in reproductive-age women, as early diagnosis and surgical management can improve outcomes.

Case Report: Incomplete Bifid Ureter with Corresponding Venous Anomalies

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Background: Duplications of the collecting system are among the most common congenital malformations of the urinary tract, with bifid ureters resulting from incomplete or complete duplication of the ureteric bud during embryologic development. Although these anomalies are often asymptomatic and discovered incidentally, they are clinically relevant because they may predispose patients to urinary tract infections, obstruction, vesicoureteral reflux, and complications during abdominal or retroperitoneal surgery. Concurrent vascular anomalies may further complicate surgical planning and raise questions regarding shared embryologic mechanisms.

Case Presentation: An incomplete duplicated (bifid) ureter was identified on the right side of a nonagenarian female donor during routine cadaveric dissection. The duplicated ureter united proximal to the ureterovesical junction as a single ureter to enter the bladder. The kidneys appeared grossly unremarkable, and no additional urinary tract abnormalities were appreciated. However, the donor also presented with a left-sided inferior vena cava (IVC) and associated venous variants.

Discussion: Incomplete ureteral duplication results from premature bifurcation of the ureteric bud before it reaches the metanephric blastema. In contrast, abnormalities involving the inferior vena cava arise from the complex development, regression, and anastomosis of the embryonic cardinal, subcardinal, and supracardinal venous systems. Although these developmental processes are generally considered independent, isolated reports describe the coexistence of urinary and vascular anomalies.

Conclusion: This case highlights the incidental discovery of a right-sided bifid ureter with concurrent atypical abdominal vascular anatomy during cadaveric dissection. Although a direct embryologic relationship cannot be established from a single observation, awareness of these anatomic variants is essential for operative planning, radiologic interpretation, and anatomy education. Additional reports are needed to determine whether this combination is coincidental or reflects a broader pattern of developmental variation.

Title: Preventing NSAID-Associated Postpartum Acute Kidney Injury Through Improved Prescription Clarity

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Background:
Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly prescribed medications for pain management following cesarean section and are generally safe when used appropriately. Acute kidney injury is a well-recognized complication of NSAID overuse that results from inhibition of renal prostaglandin synthesis, leading to decreased renal perfusion and glomerular filtration rate. NSAIDs may be prescribed with directions to take “as needed” or “PRN.” However, these instructions may be misinterpreted and result in unintentional overuse. This case highlights the consequences of unclear medication instructions and underscores the need for more explicit prescribing language.

Case Presentation:
A 34-year-old female with a past medical history of recent uncomplicated cesarean section with bilateral salpingectomy presented 6 days post-partum with abdominal pain, generalized edema, and difficulty walking. She denied vomiting, diarrhea, decreased fluid intake, or excessive bleeding. The patient was found to be in acute renal failure with a blood urea nitrogen of 39 mg/dL, creatinine of 3.46 mg/dL, and estimated glomerular filtration rate of 17 mL/min/1.73 m^2. The acute renal failure was suspected to be secondary to acute tubular necrosis in the setting of NSAID use. A renal biopsy was not performed as the patient’s renal function began improving. Upon discharge after her cesarean section, the patient was prescribed 600 mg of ibuprofen to take every 6 hours as needed. Although prescribed PRN, the patient took ibuprofen every six hours regardless of pain because she interpreted it as a scheduled medication, resulting in acute kidney injury.

Discussion/Conclusion:
Overuse of NSAIDs is a common, preventable cause of acute kidney injury. Proper patient education and clear prescription instructions may be useful in preventing this complication, particularly during the postpartum period when patients receive multiple discharge instructions and medications. Providing clear, simple language on prescriptions may allow patients to more safely take their medications and avoid adverse events. This case illustrates how technically correct prescription instructions may still be misunderstood by patients. The common auxiliary instruction phrasing of taking ibuprofen “as needed” or “PRN” along with the dose can be misinterpreted by patients, especially those with poor health literacy. Incorporating explicit language such as “take only if needed for pain” and reinforcing PRN dosing during discharge counseling may reduce preventable medication-related adverse events.

Retained Large Plastic Fragment: A Case Report

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Background: Retained radiolucent foreign bodies following high-energy trauma remain a recognized but incompletely studied diagnostic challenge in emergency and outpatient settings. The forearm's anterior and posterior compartments create discrete fascial spaces through which penetrating debris can travel and become sequestered within muscle. Missed foreign bodies risk chronic pain, infection, osteomyelitis, neurovascular injury, and potentiated immune responses such as granuloma formation. Plain radiography, the standard initial modality, cannot reliably detect plastic, wood, or organic debris; ultrasound improves sensitivity but is operator-dependent; MRI offers superior localization and visualization of reactive soft tissue change. No standardized diagnostic algorithm exists for high-energy traumatic lacerations, and literature on retained plastic foreign bodies in the extremities remains limited to isolated case reports.

Case Presentation: A male patient in his mid-20s presented to a sports medicine clinic approximately nine weeks after a motorcycle crash with persistent right forearm pain (8/10), swelling, and a firm, tender, mobile nodule overlying the extensor muscle belly, unchanged since injury. At the time of the crash, he sustained road rash and lacerations requiring ten sutures, with primary wound closure performed at an outside emergency department; documentation of imaging nor formal wound exploration at that initial visit was not available for review. Plain radiography obtained approximately one week post-injury was negative for acute osseous abnormality and did not identify a foreign body. Given symptoms inconsistent with expected healing and a high-energy mechanism raising concern for retained road debris or plastic vehicle components, MRI of the right forearm was ordered, identifying a foreign body within the extensor digitorum muscle measuring 21 x 19 x 2.5 mm with surrounding reactive edema.

Surgical Findings and Results: Open exploration and excision were performed under anesthesia, which demonstrated full elbow and wrist range of motion. A prominent, mobile foreign body was dissected free from the extensor digitorum and removed intact: a clear plastic fragment measuring 30 x 27 x 4 mm. Thorough exploration confirmed no residual debris; the wound was irrigated, curetted, and debrided. The patient reported complete resolution of preoperative symptoms at his initial postoperative visit, declined formal physical therapy, and returned to resistance training within seven days without pain. No complications were noted, though the patient did not return for further follow-up.

Discussion/Conclusion: A clinically palpable plastic fragment went undetected for nine weeks despite negative plain radiography, illustrating that a radiolucent foreign body's absence on x-ray does not indicate its absence in the wound. This diagnostic delay is consistent with anchoring bias, in which persistent post-traumatic symptoms are attributed to normal healing rather than prompting reassessment. Thorough physical examination and systematic wound exploration remain the most reliable means of detecting radiolucent debris at the time of initial injury, and MRI should be pursued when clinical suspicion persists despite negative radiographs. This case underscores the absence of a standardized diagnostic algorithm for high-energy traumatic lacerations and supports a lower threshold for advanced imaging, including bedside ultrasound in the emergency department and early MRI for persistent symptoms, to reduce diagnostic delay and morbidity. Larger prospective and retrospective studies are needed to establish evidence-based imaging guidelines for this population.

Title: Revision Anterior Cruciate Ligament Reconstruction Using Reharvested Ipsilateral Quadriceps Tendon Autograft

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Abstract

Revision anterior cruciate ligament reconstruction (ACLR) presents unique challenges due to prior graft harvest, altered anatomy, and limited autograft options. While quadriceps tendon (QT) autograft is well established in both primary and revision of ACLR, reharvest of a previously used QT remains poorly described. We report on a 23-year-old female with recurrent knee instability 18 months after primary ACLR with QT autograft. Physical examination revealed a Grade II B anterior drawer and a Grade II B Lachman test with a positive McMurray test. Additionally, preoperative MRI demonstrated a regenerated QT with preserved continuity and a thickness of 9 mm, suggesting feasibility for reharvest. The patient underwent revision ACLR using a reharvested ipsilateral QT autograft with internal brace augmentation and concomitant meniscal repair. Intraoperative assessment confirmed adequate tendon quality for reharvest. Postoperative recovery was uncomplicated, with progressive return to activity. This case supports the use of MRI to evaluate donor-site regeneration and suggests reharvested QT autografts may be a viable option in carefully selected revision cases.

Postoperative evaluation at 9 and 12 months demonstrated an operative-limb quadriceps torque-to-body-weight improvement from 1.79 to 2.08 Nm/kg, though a persistent strength deficit remained with a limb symmetry index (LSI) of around 57% at 12 months. Functional performance testing at 12 months showed a single-leg hop LSI of 86.9%, triple hop LSI of 90.8%, and Y-Balance composite reach LSI of 83.7%. The patient-reported outcome measures included a Lower Extremity Functional Scale score of 74/80 and an ACL Return to Sport after Injury score of 85.4.

Ipsilateral QT reharvest represents a viable autograft alternative for ACLR when preoperative MRI and intraoperative evaluation confirm sufficient structural regeneration. However, persistent quadriceps deficits highlight that strength recovery may be a critical rate-limiting factor for full return-to-sport clearance, underscoring the need for further research to establish long-term functional efficacy.

Title: When Creatinine Spikes and Sodium Drops: Managing Acute Kidney Injury with Severe Symptomatic Hyponatremia

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The clinical management of patients with multiple comorbidities presenting in the setting of acute kidney injury (AKI) with severe symptomatic hyponatremia is complex. Management is often complicated by polypharmacy, impaired water excretion, and increased susceptibility to rapid shifts in serum sodium increasing the risk for adverse effects.

This case involves a 85-year-old male with a history of stage 3 chronic kidney disease (CKD), heart failure with preserved ejection fraction, chronic obstructive pulmonary disease, and hypertension on hydrochlorothiazide (HCTZ) and Lisinopril who presented to the emergency department (ED) with altered mental status (AMS). Outpatient labs revealed an elevated creatinine of 8.7 compared to baseline of 1.5 along with a BUN of 110 and he was advised to go to the ED. For several days preceding his presentation he was having upper respiratory symptoms and was being treated with Azithromycin for suspected pneumonia. In the ED, he was hypotensive in the 90s/40s which improved with intravenous fluids. CMP in the ED showed severe hyponatremia at 112, low bicarbonate at 11, and AKI on CKD with a creatinine of 8.79 with BUN of 124. Serum osmolarity was 289. Urine osmolarity was 284. Urine sodium was <20. He was admitted to the intensive care unit and started on isotonic sodium bicarbonate at 75 ml/hr with Q2 BMPs with improvement in his serum sodium to 118. However, the subsequent sodium was 116 and he was started on a 3% saline infusion (HTS). His urine output increased significantly and sodium began to increase faster than goal. As the urine output remained elevated, 1mcg of Desmopressin was given and sodium continued to improve at goal. He was transitioned to normal saline with serum sodium slowly returning to normal. Renal function and mental status improved daily with creatinine down to 1.7 from 8.79 by time of discharge with recommendations to discontinue HCTZ and obtain weekly labs for the following 3–4 weeks.

This case is unique for the rare presentation of severe symptomatic hyponatremia with advanced AKI. The cause of the patient's presentation is likely multifactorial. However, a likely cause is Thiazide-induced hyponatremia. The patient is also on Lisinopril and has pneumonia which can precipitate volume depletion leading to hypovolemic hyponatremia and prerenal azotemia. In the treatment of this patient, isotonic sodium bicarbonate was useful for correcting volume depletion and acidosis. HTS was subsequently given due to the persistent hyponatremia with AMS. Desmopressin was given to halt overcorrection by limiting free water excretion as the patient started to have rapid water diuresis after volume repletion. In high risk patients with acute severe symptomatic hyponatremia, it is recommended to not increase serum sodium greater than 4-6 mmol/L in 24 hours with a strict limit of 8-10 mmol/L in 24 hours to avoid central pontine myelinolysis. Thus, it is recommended to frequently monitor sodium concentration and strictly adhere to correction limits to prevent overcorrection.

Title: Triggered by Pressure: Hypertension as the Likely Cause of Postpartum Thrombotic Microangiopathy

Authors: Max Scholl, MPH; David Calderhead, MD

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Thrombotic Microangiopathy (TMA) is a syndrome of microvascular injury characterized by endothelial damage, microthrombi, microangiopathic hemolytic anemia, thrombocytopenia, and organ dysfunction. Primary TMA can be caused by thrombotic thrombocytopenic purpura (TTP) in the setting of ADAMTS13 deficiency or atypical hemolytic uremic syndrome (aHUS) triggered by stressors such as a postpartum state. However, a secondary cause such as hypertension in the setting of chronic kidney disease (CKD) is an important etiology to consider in patients without ADAMTS13 deficiency such as the patient in this case.

This case involves a two-week postpartum 31-year-old female with a history of CKD stage 4, HFpEF, cardiomyopathy, poorly controlled hypertension, with a prior kidney biopsy showing evidence of TMA who presented to the emergency department (ED) with uncontrolled hypertension. She presented with elevated blood pressure in the 180s/100s which was treated with intravenous Labetalol. The patient had accompanied stable dyspnea on exertion along with intermittent headaches. Laboratory results supported hypertension-induced TMA as there was evidence of acute kidney injury (AKI) on CKD with a creatinine of 3.38 from baseline of 2.51, elevated lactate dehydrogenase of 337 reflecting microangiopathic hemolysis, and elevated urine protein/creatinine ratio of 1.12 suggesting hypertensive kidney injury. Furthermore, AST, ALT, and bilirubin were normal which argues against HELLP syndrome. Following treatment with Labetalol and Nifedipine, her blood pressure returned to baseline and her AKI resolved and she was subsequently discharged home.

This case highlights the importance of distinguishing between hypertension-induced TMA from other postpartum TMAs such as TTP, aHUS, or HELLP Syndrome. Between these different conditions, there are overlapping features such as hemolysis, renal injury, and thrombocytopenia. However, several findings in this case suggest a hypertensive-driven TMA. HEELP syndrome was less likely in the setting of normal AST, ALT, and bilirubin as HELLP usually involves hepatic injury and hemolysis. In the postpartum state, aHUS may occur. However, it is characterized by progressive renal failure and hemolysis despite supportive therapy which was absent in this case. TTP was less likely in the setting of normal ADAMTS13 and no evidence of significant thrombocytopenia or neurological symptoms. Furthermore, her rapid improvement with blood pressure management argues against primary TMA. In this case, the patient has a history of poorly controlled hypertension in the setting of CKD along with laboratory evidence of microangiopathic hemolysis with improvement with antihypertensive treatment suggesting hypertension-driven TMA. This underscores that uncontrolled hypertension can be a reversible cause of secondary TMA even in the postpartum period in patients with preexisting cardiovascular comorbidities. This exemplifies the importance of integrating patient history, laboratory patterns, and response to therapy in differentiating postpartum TMAs to guide appropriate management while avoiding unnecessary treatment.

Title: Abdominal pain, Arthralgia, and Purpura: Recognizing Adult-Onset Henoch-Schönlein Purpura

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Henoch-Schönlein purpura (HSP) is a small vessel vasculitis caused by deposits of IgA immune complexes in blood vessel walls. It classically presents with arthralgia, abdominal pain, and purpura. While most common in children, adult-onset HSP is rare and often presents with atypical presentations. The gastrointestinal involvement can mimic intra-abdominal processes such as enteritis which can lead to diagnostic uncertainty.

This case involves a 19-year-old male with a past medical history of exercise-induced asthma who presented to the emergency department (ED) with a one week history of diffuse abdominal pain, worsening rash, and severe joint pain. Despite a three-day course of Prednisone, the palpable purpuric rash did not improve and continued to spread proximally from his bilateral ankles to just distal to the knees including his bilateral forearms. There was no involvement of the trunk. The patient denied itching or burning associated with the rash. He denied fever, neck or back pain. CRP and Sed Rate Westergren were mildly elevated at 17.6 and 36 respectively. WBC was elevated at 16.6, hemoglobin was normal at 15.6, and platelets were normal at 372. IgA level was elevated at 362. Procalcitonin and lactic acid were negative. Coagulation studies along with urine protein/creatinine were normal. Computed tomography (CT) of the abdomen/pelvis showed fluid filled loops of mildly prominent small bowel concerning for enteritis versus ileus. The patient had concerning signs for enteritis with high suspicion of HSP in the setting of colicky abdominal pain, new onset extremity rash, and joint pain. He was initiated on a 3-day course of IV Solumedrol followed by an oral Prednisone taper with eventual resolution of his symptoms.

This case is unique for the atypical presentation of adult-onset HSP with prominent gastrointestinal findings which can mimic enteritis. In the absence of fever, reassuring laboratory results, and non-toxic appearance, bacterial infection was less likely. This underscores the importance of early clinical awareness recognizing the triad of abdominal pain, palpable purpura, and joint pain to prevent unnecessary diagnostic and possible surgical interventions. Although the patient lacked signs of renal involvement, close outpatient follow up is essential to monitor for delayed renal decline. Clinicians should maintain HSP on the differential diagnosis in patients with compatible systemic symptoms as early diagnosis and treatment with corticosteroids can lead to rapid resolution of symptoms.

Title: Multiorgan Sarcoidosis Mimicking Metastatic Lymphoma: A Diagnostic Challenge

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Lymphoma is a malignancy of the lymphoid system often presenting as lymphadenopathy with potential multiorgan involvement. Sarcoidosis is a systemic granulomatous disease of unknown etiology that often presents heterogeneously with an unpredictable clinical course, commonly affecting the lungs, lymph nodes, liver and spleen. As a consequence, sarcoidosis has the potential to mimic lymphoma clinically and radiographically.

This case involves a 40-year-old female with a history of HFpEF, morbid obesity, prior pulmonary embolism, and pulmonary hypertension who presented to the emergency department (ED) with one week of abdominal pain, vomiting, and diarrhea. Computed tomography (CT) scan of the abdomen revealed hepatomegaly and multiple ill defined hypodense lesions concerning for metastatic disease with pathological enlarged retroperitoneal lymph nodes increased since last year when she was lost to follow up suggestive of lymphoma. She denied a family history of leukemia or lymphoma. Laboratory studies were negative for LDH, EBV, CMV, hepatitis, HIV, and AFP. Angiotensin converting enzyme was within normal range. She underwent bone marrow biopsy which was normocellular and retroperitoneal lymph node biopsy which revealed nonnecrotizing granulomatous inflammation consistent with sarcoidosis rather than lymphoma. The patient presented to the ED one month later with progressive dyspnea, edema, and intermittent chest pain with clinical evidence of fluid overload. There was concern that cardiac sarcoidosis could be a contributing factor to the acute on chronic diastolic congestive heart failure presentation. BNP and troponins were within normal limits. She was started on IV diuresis and cardiac MRI showed nonspecific late gadolinium enhancement. A right heart catheterization was performed and showed a low cardiac index and no evidence of fluid overload which further adds concern for cardiac sarcoidosis which necessitated follow up positron emission tomography (PET) scan. Aggressive diuresis provided improvement in her weight and symptoms and she was discharged. The PET scan showed no evidence of sarcoidosis or myocardial inflammation with hypermetabolic lymph nodes within the mediastinum and upper abdomen as well as innumerable foci of hypermetabolism within the liver and spleen presumed to reflect active sarcoid.

This case demonstrates a unique diagnostic challenge of a patient with systemic sarcoidosis presenting with diffuse lymphadenopathy and visceral lesions that were suspicious for metastatic lymphoma based on initial CT imaging. It underscores the limitations of radiographic modalities in distinguishing sarcoidosis from lymphoma and highlights the importance of tissue biopsy for definitive diagnosis. Sarcoidosis should remain on the differential diagnosis for patients presenting with suspected lymphoproliferative disorders as it can mimic metastatic lymphoma.

"Fatal Persistent Cavitary *Mycobacterium avium* Complex Pulmonary Disease in a Non-HIV Patient With Prior Malignancy"

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Background:
Mycobacterium avium complex (MAC) pulmonary disease commonly occurs in patients with structural lung abnormalities and generally follows a chronic, slowly progressive course. Cavitary disease, persistent structural lung abnormalities, and incomplete treatment are associated with disease progression and recurrence. We present a case of persistent cavitary MAC pulmonary disease with rapid progression to respiratory failure and death in a non-HIV patient.

Case Presentation:
A 71-year-old woman with a history of recurrent MAC pulmonary infection, advanced bronchiectasis, and prior malignancy presented with five to six months of progressive dyspnea, productive cough, generalized weakness, and a 25-pound unintentional weight loss. Prior MAC treatment had been intermittent because of medication intolerance and financial barriers. Chest computed tomography demonstrated extensive bilateral cavitary pulmonary lesions, numerous pulmonary nodules, ground-glass opacities, consolidation, and bilateral bronchiectasis. Sputum acid-fast bacillus cultures grew *Mycobacterium avium*, while HIV and additional infectious testing were negative. MAC-directed therapy with azithromycin, rifampin, and ethambutol was initiated. Intravenous amikacin was considered but was not initiated because of renal failure. Despite treatment, the patient developed progressive hypoxemic respiratory failure requiring mechanical ventilation and septic shock requiring vasopressor support. Her course was further complicated by severe lactic and metabolic acidosis, acute kidney injury, hyperkalemia, and non-ST-elevation myocardial infarction. Despite aggressive management, she developed progressive respiratory and circulatory failure and died during hospitalization.

Discussion:
This case demonstrates the potential for persistent MAC pulmonary disease to follow an unusually aggressive and fatal course in non-HIV patients. Underlying bronchiectasis, extensive bilateral cavitary disease, and prolonged interruptions in therapy may have contributed to disease persistence and progression. Medication intolerance and financial barriers further complicated the sustained multidrug therapy required for MAC pulmonary disease.

Conclusion:
Advanced cavitary MAC pulmonary disease can rarely progress to fatal respiratory failure in patients without HIV infection. Early recognition, close longitudinal follow-up, sustained access to and tolerance of guideline-directed multidrug therapy, and efforts to address barriers to medication access are essential in high-risk patients.

Cardiac Sarcoidosis Diagnosed on Explant Pathology Following Heart Transplantation

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Introduction

Cardiac sarcoidosis (CS) is a rare and likely underrecognized manifestation of sarcoidosis. CS typically occurs in the context of systemic sarcoid, but isolated cases may exist. We present two cases of patients with nonischemic cardiomyopathy (NICM) who underwent heart transplantation (HT) and were subsequently found to have evidence of CS on explant pathology.

Case Description

Patient 1

A 58-year-old woman presented with symptoms of exertional dyspnea and was diagnosed with complete heart block requiring permanent pacemaker implantation. Four years later, she developed new heart failure symptoms with LVEF 20-25% and was diagnosed with NICM; her device was upgraded to a biventricular system. She experienced progression to end stage heart failure, eventually requiring HT. Explant pathology demonstrated noncaseating granulomas and extensive fibrosis. She was maintained on tacrolimus and longterm low dose steroids. (74)

Patient 2

A 61-year-old man with a history of NICM secondary to severe mitral regurgitation (MR) underwent surgical mitral valve repair. Following discharge, the patient had progressive symptoms of end stage heart failure. CMR demonstrated LVEF 10% and small, focal, mid-wall LGE along the basal inferior RV insertion site. He ultimately underwent HT with explant pathology demonstrating noncaseating granulomas of the LV and interventricular septum. He was maintained on tacrolimus and longterm low dose steroids.

Conclusion

These cases highlight the diagnostic difficulty of CS and management dilemma with incidental discovery. Patient 1 did not undergo advanced cardiac imaging; this highlights the importance of maintaining a high index of suspicion for CS, particularly when presenting with unexplained conduction disease. Patient 2 likely represents a perplexing case of mixed cardiomyopathy due to both CS and valve disease. His minimal LGE on CMR may reflect a lack of active inflammation or extensive fibrosis. Interestingly, neither patient exhibited evidence of extra-cardiac sarcoidosis. Finally, these incidental findings highlight the immunosuppressive considerations of patients with CS post-transplant.

LRRK1-Related Osteosclerotic Metaphyseal Dysplasia: A Three-Case Series

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Background: Skeletal dysplasias comprise a diverse group of genetic disorders affecting bone and cartilage development. Osteosclerotic skeletal dysplasias are a subset characterized by increased bone density and impaired bone remodeling. Osteosclerotic metaphyseal dysplasia (OSMD) is an ultra-rare skeletal dysplasia associated with pathogenic variants in LRRK1 (*leucine-rich repeat kinase 1*), a key regulator of osteoclast function and bone resorption. Phenotypic findings in OSMD typically include progressive osteosclerosis, metaphyseal abnormalities, fractures, growth impairment, and variable skeletal complications. As of 2023, there are 13 cases of OSMD reported in literature, with only 8 being molecularly confirmed. As a limited number of cases have been reported, the phenotypic spectrum, natural history, and long-term clinical outcomes of LRRK1-related OSMD remain incompletely defined.

Methods: We performed a retrospective chart review of three individuals with LRRK1-related OSMD from two unrelated families. Clinical, molecular, radiographic, and laboratory data were collected and analyzed. Available skeletal imaging studies were independently reviewed by two skeletal dysmorphologists and clinical geneticists (D.B. and C.G.) to characterize radiographic findings and assess phenotypic variability. Clinical features were summarized to expand the understanding of the phenotypic spectrum associated with LRRK1 skeletal dysplasia.

Results: Previously reported cases of OSMD had findings of osteosclerosis of the metaphyses and osteopenia of the shafts of long bones, and osteosclerosis of the vertebral bodies, ribs, pelvis, and skull. Certain cases had short stature, Erlenmeyer flask deformity of the femurs, osteonecrosis of the jaw, mild facial dysmorphism, or developmental delay. Proband 1 is a 9-year-old girl with a history of idiopathic thrombocytopenia purpura and autism. Radiographs showed metaphyseal sclerosis. Proband 2 is a 6-year old boy with a history of pyogenic granulomas and asthma. Chest x-ray in the setting of status asthmaticus incidentally showed osteosclerosis of proximal humeri and ribs. Proband 3 is the 8-year old sister of proband 2 with a history of Grave's Disease. Radiograph of the knee for trauma showed increased density of metaphyseal bands at age 5.

Conclusion: These three individuals from two unrelated families with LRRK1-related skeletal dysplasia broaden the known phenotype of this rare disorder. This study expands the spectrum of recognized clinical and imaging findings, including novel presentation of the idiopathic thrombocytopenia purpura, which has not been previously reported.

BALANCING RISK AND RELIEF: THORACIC EPIDURAL USE IN LIVER TRANSPLANTATION

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Background: Patients usually spend one to three days in the intensive care unit following a liver transplant. Post-operative pain is typically described as moderate to severe in the first few days, particularly around the large incision site. Transversus abdominis plane blocks, abdominal wound catheters, or thoracic epidurals may be used for targeted pain relief, depending on clotting profiles. While a thoracic epidural offers superior pain control, the risk of developing epidural hematoma in cirrhotic patients with impaired coagulation limits its routine use. Also, higher rates of abscess and nerve injury are associated with chronic liver disease.

Case Presentation: 21 years old male received a liver transplant due to liver disease. Past medical history is significant for X-linked erythropoietic protoporphyria complicated by hepatic cirrhosis and ascites as well as anemia, leukopenia, and thrombocytopenia. Other comorbidities included acute pancreatitis, dysuria, chronic and neuropathic pain. Patient is non-English speaking. Three days after the surgery patient underwent an epidural catheter placement for post-operative pain management. Patient monitoring included EKG, continuous capnography, continuous pulse ox and blood pressure. Midline approach was used. Location was at T7-8. Spring wound catheter was used. Medications administered: 0.125% bupivacaine at 8 ml every 1 hour, then the rate was increased to 10 ml every 1 hour. After the rate increase to 10 ml the patient was satisfied with the pain level and was able to eat and ambulate. Epidural was removed 6 days later.

Conclusion: Thoracic epidural analgesia can be effectively used for postoperative pain management after liver transplantation. Research has shown that an epidural containing a local anesthetic, with or without the addition of an opioid, decreases pain after a major abdominal surgery and accelerates the return of gastrointestinal transit. The benefits of the epidural: it provides superior pain control compared to intravenous opioids, reduces the need for systemic opioids and helps in avoiding sedation and reducing pulmonary complications. An important consideration in liver transplant patients is hepatic coagulopathy-related increased risk of inducing epidural hematoma. Coagulation profile should be checked before epidural placement. Another consideration is that epidurals might cause urinary retention and a decreased urge to urinate, so a patient requires a urinary catheter while epidural is in place.

RESEARCH, QI and SCHOLARLY WORK

Pre-operative PET Usage & Pathologic Response in Neoadjuvantly Treated Pancreatic Adenocarcinoma

Authors: Eaman Ahmad[1], James Hosner[1], David Gregorich[1], Linda Qu[1]; [1]Michigan State University, College of Human Medicine

Introduction: Tumor response to neoadjuvant therapy is currently confirmed only after surgical resection using the CAP tumor regression grading system. FDG-PET metabolic parameters, particularly SUVmax, have shown correlation with pathologic response and survival in PDAC. However, the utilization and timing of preoperative PET imaging in routine clinical practice remain variable. This study describes preoperative FDG-PET findings, timing relative to neoadjuvant therapy, and corresponding CAP tumor regression grades in a single institution cohort of resected PDAC.

Methods: Patients with PDAC treated between 2012 and 2024 were retrospectively identified from the electronic health record. Of 165 patients screened, 47 underwent a preoperative PET scan and 9 met inclusion criteria of neoadjuvant therapy followed by surgical resection. Demographic, clinical, and pathologic variables were collected. CAP responders (CAP score of 0-1) were compared with non-responders (CAP score of 2-3) using Fisher's exact and Mann-Whitney U tests.

Results: Of the 9 patients, 6 were men and 3 were women (mean age at diagnosis 71.3 ± 9.78; 8 White, 1 Black). Neoadjuvant regimens utilized were gemcitabine/paclitaxel (n =4), FOLFIRINOX (n = 3), gemcitabine monotherapy (n =1), and gemcitabine/paclitaxel followed by FOLFIRINOX (n =1). Mean duration of neoadjuvant therapy was 72.8 ± 30.7 days (mean 2.78 ± 1.13 cycles). Post-neoadjuvant CA 19-9 values were available for 6 of 9 patients (mean 85.4 ± 64.2). Median time from diagnosis to PET was 15 days, with the scan preceding the first cycle in 5 patients and occurring during or after treatment in 4 patients. CAP grade was reported in 7 patients. In the remaining two patients, the pathology report documented "no known prior therapy" despite documented neoadjuvant chemotherapy. 3 (42.8%) were CAP responders and 4 (57.1%) were CAP non-responders. Responders were younger than non-responders (68.0 ± 12.2 vs 75.5 ± 3.3 years; p = 0.59). Sex and race distributions were similar between groups, and no significant differences were observed in neoadjuvant regimen, duration of neoadjuvant therapy, or preoperative CA 19-9. Mean preoperative tumor SUVmax in responders was 5.3 ± 2.4 and 3.9 ± 2.6 in non-responders (p = 0.86). Mean post-operative CA 19-9 was 52 ± 48.1 U/mL in responders and 101.3 ± 116.8 U/mL in non-responders (p =0.85). Adjuvant therapy was administered to all responders and 75% of non-responders (p=1).

Conclusion: FDG-PET utilization relative to neoadjuvant therapy was variable, with scans performed before, during, and after treatment, and paired pre- and post-treatment PET was not consistently available. No clear relationship was observed between preoperative SUVmax and CAP tumor regression grade, although the study was limited by small sample size. Larger studies with standardized PET timing are needed to define the role of FDG-PET in predicting pathologic response and informing prognosis in patients with PDAC.

Abstract Title: Mini Med School: Inspiring Refugee and Muslim Youth Through Early Exposure to Healthcare Careers

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Background: Students from refugee, Muslim, and other underrepresented minority communities often have limited exposure to healthcare careers and medical education opportunities. Early engagement initiatives may help increase awareness of healthcare professions while fostering interest in science, health, and medicine. The Mini Med School program was developed to provide hands-on medical education experiences for middle school students from underserved communities in Michigan.

Methods: Over two academic years, ROC conducted Mini Med School events across refugee-serving schools in Grand Rapids and East Lansing, reaching approximately 120 middle-school students with participation from 40 medical student volunteers. Interactive sessions combined career exploration, anatomy education, and health promotion. Students participated in small group discussions with medical students regarding pathways to medicine and completed hands-on activities including construction of model lungs to demonstrate smoking-related lung injury, model hearts to illustrate cardiovascular physiology and exercise, and skin-health demonstrations emphasizing sun protection and preventive care.

Results: The program successfully engaged students from minority backgrounds through interactive learning and mentorship. Participants demonstrated enthusiasm for healthcare topics and actively engaged in discussions about medical careers and healthy lifestyle practices. Medical student volunteers gained experience in mentorship while fostering connections with underserved populations.

Discussion: Mini Med School represents a scalable model for community-based medical education outreach. Programs targeting refugee and immigrant youth are rarely described in the medical education literature despite persistent disparities in representation within healthcare professions. By targeting refugee and Muslim youth who may have limited exposure to healthcare professionals, the program seeks to promote educational equity. Future efforts aim to expand the initiative to additional mosques, schools, and refugee-serving communities throughout Michigan to increase access to early healthcare career exploration and science education.

Conclusion: Early exposure to medicine through culturally responsive, hands-on educational programming can inspire students from underserved communities to explore healthcare careers while strengthening medical student engagement in service and community outreach.

Survey on the Impact of Behavioral Health Integration on MyMichigan Health Primary Care Providers' Confidence in Managing Psychiatric Conditions

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Background: MyMichigan Health has an integrated behavioral health program that provides access to clinical psychologists, psychiatrists, and social workers within primary care settings to support patients and providers. Although integrated behavioral health programs have been shown to improve behavioral health outcomes, effective implementation can be challenging. It is therefore important to evaluate whether these programs are improving provider confidence in managing behavioral health concerns as intended. This survey project aims to provide information on primary care providers' confidence and perceptions of integrated behavioral health services to identify opportunities for program improvement.

Methods: A voluntary, anonymous, cross-sectional Qualtrics survey was administered to primary care providers across the MyMichigan Health system. The eleven-question survey collected information about provider type, number of years in practice, and the presence of integrated behavioral health support at their practice site. Likert-scaled survey questions gathered providers' self-reported confidence in identifying patients who may benefit from behavioral health services, connecting patients with behavioral health support, managing behavioral health crises and complex psychiatric comorbidities, and providing brief behavioral health interventions in primary care. Data were collected over a period of ten weeks. Inferential statistics were used to analyze and compare primary and secondary outcomes across provider groups.

Results: The survey was administered to 168 primary care providers, and 27 responses were received, yielding a response rate of 16.07%. There was a statistically significant relationship between having behavioral health integration and providers' confidence in addressing mild or emergent behavioral health concerns before they escalate ($p = 0.00354$) and providers' confidence in facilitating timely access to care ($p = 0.00381$). There was a statistically significant relationship between clinical role and confidence in providing brief behavioral interventions ($p = 0.00503$), confidence in managing complex psychiatric comorbidities ($p = 0.00955$), and confidence in identifying patients who would benefit from additional behavioral health services ($p = 0.0137$). There was no statistically significant relationship between clinical role and confidence in connecting patients with timely behavioral health support ($p = 0.199$) or provider confidence in managing behavioral health crises ($p = 0.263$).

Conclusion: Among MyMichigan primary care providers, behavioral health integration was associated with greater provider confidence in facilitating timely access to care and in addressing mild or emergent behavioral health concerns before they escalate.

Multimorbidity Among Adults in the Flint Registry with Kidney Disease

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Background: In 2014, a municipal water switch in Flint, Michigan, exposed roughly 100,000 residents to lead-contaminated drinking water, triggering a major public health crisis. In response, the Flint Registry was established to track long-term health outcomes of exposure to lead-contaminated water and to connect residents to recovery resources. Emerging data from the registry has already demonstrated a noticeable burden of chronic conditions among exposed adults. Specifically, the age-adjusted prevalence of kidney disease among adult registry participants is 8.1%, double Michigan's average of 3.4%. Chronic kidney disease (CKD) is commonly associated with other comorbidities. In primary care-based studies, upwards of 86% of people with CKD live with one or more other chronic conditions such as hypertension, obesity, and diabetes. Although lead exposure is a known risk factor for renal damage, the relationship between self-reported kidney disease and multimorbidity in this population is not well understood. Driven by these findings, Flint community partners and residents have pushed for research that moves past a single-disease approach. There has been strong community level interest to understand how chronic conditions interact and which are most strongly associated with kidney disease within this population. This study describes the association between self-reported kidney disease, multimorbidity, and demographic factors among adult participants of the Flint Registry.

Methods: This cross-sectional study of the Flint Registry included participants aged 18 years and older with multimorbidity, defined as one or more chronic health conditions. Descriptive statistics were performed to characterize multimorbidity among participants with and without kidney disease.

Results: Data from 10,134 adult participants from the Flint Registry were included, in which 10.1% reported a diagnosis of kidney disease and 69.7% experienced multimorbidity. People with kidney disease comprised larger proportions of the population as the number of comorbidities increased: 2.8% with one chronic health condition, 5.8% with two conditions, 10.4% with three conditions, and 21.4% with four or more conditions. Kidney disease was more common among older participants (from 5.7% of all participants under age 45 to 16.8% of those 65 and older) and those who lived in Flint throughout the 18-month water crisis (10.8% versus 7.4% among those with shorter residency). The proportion of participants reporting kidney disease varied by two measures of socioeconomic status: household income (10.9% of participants with household incomes of <$50,000 versus 5.9% of those making $50,000 or more) and educational attainment (10.7% of those who did not graduate from college compared to 7.4% of those who did).

Conclusions: These findings demonstrate a connection between multimorbidity burden and kidney disease within a population exposed to an environmental disaster. The high burden of multimorbidity among participants with kidney disease emphasizes the importance of holistic, not single-disease, management approaches for people like those in Flint. Clinically, these data support the importance of implementing an integrated, multi-system screening and treatment protocol for high-risk patients. From a public health and policy lens, the data also highlight the value of sustained funding for targeted secondary prevention efforts in under-resourced communities. Working with Flint community partners, efforts have been made to map chronic disease clusters and identify the highest risk individuals. Better information about the specific multimorbidities impacting kidney disease is needed. Ultimately, these findings provide an essential baseline for community based research and will guide the design of future longitudinal studies to track the long-term evolution of physical and psychological health in response to environmental trauma.

Geographic Variation in Sun Protection Behaviors by Region and Population Density: Findings from the National Health Interview Survey

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Introduction

Skin cancer is the most common cancer in the United States, yet sun protection behaviors remain underutilized. This study examined skin cancer prevention practices and awareness of skin cancer risk across U.S. geographic regions and levels of population density. Findings from this study can inform the development of targeted interventions aimed at improving sun protection behaviors and reducing skin cancer risk across diverse populations.

Methods

This retrospective observational study analyzed five sun protection behavior questions from the 2020 National Health Interview Survey (NHIS): hat use, sunscreen use, shade seeking, long-sleeved shirt use, and intentional tanning. Behaviors were compared across U.S. Census regions (Northeast, Midwest, South, and West) and NCHS urban-rural categories (urban, suburban, medium, and rural). Frequencies and percentages were used to summarize participant characteristics and behaviors. Pearson χ^2 tests were used to examine associations between geographic region, urbanicity, and each categorical sun protection behavior. Statistical significance was defined as $P < .05$. Bivariate analyses were utilized for this exploratory analysis.

Results

Sun protection behaviors differed significantly by geographic region and urbanicity (all $P < .001$). Respondents in the West reported the highest use of long-sleeved shirts and sunscreen, while those in the Northeast most frequently wore hats. Midwest respondents consistently reported the lowest engagement in protective behaviors and the highest rates of intentional tanning. Southern respondents were most likely to seek shade but also reported the highest prevalence of never using sunscreen. By urbanicity, suburban and large urban residents reported greater sunscreen use and shade seeking, whereas rural residents demonstrated lower use of protective measures and higher rates of blistering after sun exposure.

Discussion

Significant geographic disparities in sun protection behaviors were identified across the United States. Respondents in the West and in suburban or large urban communities reported greater use of sunscreen, protective clothing, and shade, whereas rural residents and those in parts of the Midwest and South reported lower engagement in recommended protective behaviors despite high UV exposure in some regions. These findings align with prior research showing rural disparities in preventive health, likely reflecting reduced healthcare access, greater occupational sun exposure, and limited sunscreen availability. Targeted interventions through primary care and community-based programs may improve sun protection in underserved populations. A limitation is that race and ethnicity were not evaluated but likely influence sun protection behaviors and should be examined in future studies.

Title: Characterizing Patient Encounters of a Student-Run Street Medicine Service: A Retrospective Analysis to Guide Volunteer Training

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Background: People experiencing homelessness face substantial barriers to accessing conventional healthcare and carry a disproportionate burden of acute and chronic disease. Student-run street medicine programs aim to reduce these barriers by delivering low-threshold, patient-led care in shelters and on the street. Understanding the volume, demographics, and clinical needs of this population is essential for allocating resources and preparing student volunteers. We analyzed encounter data from Spartan Street Medicine since its implementation of electronic medical records (EMR) in 2021.

Methods: We conducted a retrospective review of all patient encounters captured in the EMR from 2021 through 2025. Name and date of birth are the only demographics required at registration, while other demographic variables are optional. As a result, most demographic fields were incompletely recorded and were excluded from analysis; patient age was retained. We described annual encounter volume, the distribution of patient age, the number of encounters per unique patient, and the most frequent chief-complaint themes.

Results: Annual encounter volume increased more than fourfold over the study period, rising from 188 encounters in 2021 to 771 in 2025. A total of 1,303 unique patients were seen. Patient age was broadly distributed, with a mean of 47.28 years (SD 15.25; range 0–91). Most patients (878; 67.4%) were seen at a single visit, while 425 (32.6%) had repeat encounters (2–4 visits: 342 [26.2%]; 5–10: 68 [5.2%]; 11–20: 12 [0.9%]; ≥21: 3 [0.2%]). The most common chief-complaint themes were rash/skin concerns (130 patients; 160 encounters), cough (113; 127), back pain (87; 101), medication refills (47; 54), and headache (47; 52), followed by abdominal pain, chest pain, shortness of breath, fever, and sore throat.

Conclusions: Encounter volume at this student-run street medicine program grew substantially over five years, reflecting expanding reach within an underserved population. The predominance of dermatologic and wound-related complaints, together with cough and musculoskeletal pain, identifies concrete priorities for volunteer education. In direct response to these findings, the program is implementing wound care training for student volunteers. Ongoing standardized data capture may further refine training and inform continuity-of-care interventions.

Diagnostic Safety Guardrails for Large Language Models in Pediatric Emergency Medicine

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Study Objective: Large language models (LLMs) show promise as decision-support and educational tools in pediatric emergency medicine (PEM), but variable performance and inconsistent reasoning require cautious, supervised use. This study aimed to develop diagnostic safety guardrails and governance principles for integrating LLMs into PEM workflows using data from a prospective comparison of seven LLMs applied to diagnostically complex pediatric emergency cases.

Methods: In this prospective cross-sectional study conducted in October 2025, seven widely used LLMs were evaluated using 25 complex or rare PEM case scenarios selected by an academic faculty panel. Five expert raters scored each model across eight domains: primary diagnosis, differential diagnosis, pathophysiology, recommended diagnostic testing, treatment planning, complication anticipation, prognosis, and overall clinical utility. Interrater reliability was assessed with Cohen's kappa. Findings were reviewed for model-specific performance patterns, failure modes, and evidence-transparency gaps, which informed development of a diagnostic safety guardrail framework for high-stakes clinical settings.

Results: Diagnostic accuracy ranged from the low 70s to more than 90 percent across models. Performance was strongest in recommended diagnostic testing (84%-88%), initial treatment planning (88%-96%), complication anticipation (84%-96%), and prognosis (72%-92%). LLMs often generated structured, stepwise illness-script reasoning and were sometimes rated useful for trainees. Important weaknesses included atypical symptom recognition, laboratory and imaging interpretation, and citation of evidence sources. Several models produced clinically plausible guidance without inline references, functioning as unattributed expert opinion. These findings informed a seven-domain safety framework emphasizing clinician review, task-appropriate use, model selection by purpose, source verification, explicit uncertainty acknowledgment, user training, and longitudinal monitoring for errors and performance drift.

Conclusions: LLMs have meaningful potential as adjuncts for clinical reasoning and education in PEM, but performance variability and evidence-transparency gaps require structured guardrails. This framework offers a practical foundation for safe and ethical integration into pediatric emergency workflows.

The Impact of Pediatric Somatic Symptoms (PSS) on Frontline Providers, Healthcare Utilization, and Costs

Authors: Katherine Harmeling, David Oliver, Thea Senger-Carpenter, PhD, APRN, Natoshia Cunningham PhD, Kira Sieplinga MD, Brooke Dudick

Problem/Purpose: Pediatric somatic symptoms (PSS; such as fatigue, dizziness, headache, abdominal, body pain) impact approximately one in three youth worldwide, and are common reasons for presentation to primary and specialty care.[1] Yet, best practices for identification and management of PSS remain poorly defined, increasing patient and provider stress. Incorporating psychological management strategies into medical care may be a promising approach for PSS management; however, common practice is to refer youth for care only after extensive medical evaluation. The objectives of this study are to elucidate the effects of PSS on frontline providers and health systems in order to gain a deeper understanding of how PSS affect outpatient providers' perceptions, practices, and burnout, and to begin co-developing a brief intervention tailored to outpatient medical settings.

Methods: This is a mixed method observational study. Data collection is currently underway. We aim to survey a total of 300 primary care and specialist (e.g., gastroenterology; neurology) providers likely to treat patients with PSS regarding their PSS-related attitudes, perceptions, and management practices. We will conduct qualitative interviews with a smaller group of providers to seek their feedback on draft behavioral intervention materials. Surveys and qualitative interviews assess the impact of PSS on provider perceptions (i.e., discomfort, stress), their current management practices (e.g., placement of referrals, diagnostic testing), and levels of provider burnout. Focus groups with survey responders will be used to refine a brief intervention designed to manage PSS in outpatient medical settings.

Results: Quantitative and qualitative data analysis is currently underway. At this stage, 75 providers have completed the Pediatric Somatic Symptoms Survey and 7 of these have participated in focus group interviews. Focus group interview themes included time and parent buy-in as barriers to providing meaningful care to PSS patients. Interviewees have expressed interest in implementing the psychosocial intervention and believe the design and materials would be effective with their PSS patients. Some have indicated a preference for in-person care while others have stated telehealth would be more accessible for their patients.

Anticipated impact: Providers are keen to access evidence-based tools to support management of youth with PSS. The intervention we have developed holds promise. Next steps include pilot testing the intervention in primary care settings.

RNA-seq–informed germline variant curation in pediatric acute myeloid leukemia

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Background: Germline variants contribute to pediatric acute myeloid leukemia (pAML) predisposition, and proper identification of them may influence surveillance, treatment selection, stem cell transplant planning, and familial testing. The current issue is that interpretation of splice-altering variants is challenging because available computational prediction methods do not analyze the transcript-level effect of a variant. Therefore, we evaluated matched RNA sequencing data to determine if candidate germline variants produced abnormal splicing and whether this evidence altered variant classification.

Methods: Candidate germline variants from a pAML cohort were evaluated using RNA sequencing visualized in Integrative Genomics Viewer (IGV). Variant-containing samples were compared with controls to identify exon skipping, intron retention, cryptic splice-site usage, or no measurable splice effect. Observed abnormalities were then assessed using ClinGen recommendations to determine whether the resulting transcript was expected to cause loss of gene function and to assign RNA-informed PVS1 evidence strength. This evidence was then incorporated into ACMG/AMP variant classification. Previously classified variants in genes such as BRCA2 and NF1 served as positive controls for detecting expected splice abnormalities.

Results: Eighty-seven candidate variants were evaluated. Thirty-nine received RNA-informed PVS1 ratings, including 16 very strong, 10 strong, and 13 moderate ratings. Twenty-two variants underwent additional gene-specific consequence assessment; 13 supported full PVS1, seven supported moderate PVS1, and two were considered not applicable for PVS1. Incorporation of RNA and gene-specific evidence resulted in revision of the final pathogenicity classification for four variants. These included splice-altering variants in *IFNAR1*, *RNASEH2B*, *CARD9*, and *SYK*, with observed abnormalities including exon skipping and intron retention predicted to disrupt normal transcript function.

Conclusions: RNA sequencing provides direct evidence of variant-associated splicing and can substantially improve interpretation of candidate germline variants in pAML. Comparison with control samples helps prevent overcalling physiologic or background alternative splicing, while gene-specific PVS1 assessment translates observed RNA abnormalities into clinically meaningful pathogenicity evidence. This approach refined classification for multiple variants and provides a framework for subsequent evaluation of associations with treatment toxicity and clinical outcomes.

Title: Clinical Outcomes Following Multidisciplinary Molecular Tumor Board Evaluation in Patients with Lung Cancer

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Abstract:

Genomic profiling has expanded treatment options for lung cancer patients by identifying actionable molecular alterations that guide precision therapy. The Molecular Tumor Board at the UM Health-Sparrow Herbert-Herman Cancer Center was launched in 2017 and provides multidisciplinary interpretation of genomic findings for patients who have exhausted standard treatment options, require additional guidance for targeted therapy, or have rare molecular alterations. While institutional implementation of the MTB has previously been described, specific outcomes among patients with lung cancer have not been evaluated. This study aims to assess the clinical outcomes of the Herbert-Herman Cancer Center MTB by characterizing actionable genomic alterations, targeted therapies, and treatment response among patients with lung cancer. We are conducting a retrospective study including all eligible lung cancer patients presented to the MTB during the study period (anticipated n= 59). Clinical data extracted from the electronic medical record include patient demographics, tumor characteristics, molecular profiling results, MTB-recommended therapies, and clinical follow-up. Descriptive statistics and exploratory analyses will evaluate treatment patterns and clinical outcomes. Data collection and analysis are ongoing. Final analyses will characterize the frequency of actionable genomic alterations, targeted therapy administration, progression-free survival, and best treatment response. This retrospective study will provide disease-specific insight into the role of a multidisciplinary Molecular Tumor Board in guiding precision oncology for patients with lung cancer treated at a community cancer center.

Title: Infants with Cleft Palate: Comorbidities Necessitating Surgery and Risk Factors for G-Tube Placement

Author(s): Cynthia Hinderscheid (1), Ava Adler (1), Sara Best (1), Grace Schaefer (1), Aleezay Khan (1), Harish Neelam (2), Caroline Baker (3), Elizabeth Busheong (4), John Girotto (4)

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Abstract:

Background & Purpose – Patients with a cleft palate can feature complex system-level comorbidities that might require intervention other than their cleft palate. In the first few months of life, these patients may also require gastrostomy-tube (G-tube) placement to address feeding difficulties. Prior research found that system-level comorbidities (neurologic, gastrointestinal, respiratory, and cardiac) are significant risk factors for G-tube insertion and may be more predictive than syndromic status alone. To better understand overall complexity of care, we evaluated risk factors for surgery in other system-level comorbidities and G-tube placement.

Method/Description – A retrospective review of all patients with cleft palate born between 2006 to 2025 who received care at our tertiary center. Inclusion criteria consisted of infants with any feeding-relevant comorbidities at date of G-tube placement or a 2.9-month index age for patients without a G-tube. Comorbidities were grouped by system, neurologic/neuromuscular (neuro), respiratory, cardiac, and gastrointestinal (GI), and further divided into major (required surgery) or minor (did not require surgery) subgroups. Covariates included sex, race, ethnicity, insurance status, and syndromic status. Pearson's chi-squared test, Fisher's exact test, and Poisson regression analyses were performed. Adjusted (aRR) and unadjusted relative risks were determined. A $p<0.05$ was statistically significant.

Results – A total of 370 infants with cleft palate were included: 24 (6.5%) received a G-tube, and 37 (10%) and 102 (27.6%) had a major and/or minor comorbidity, respectively. Syndromic status was present in 68 infants (18.4%), of which 40 (10.8% overall; 58.8% of all syndromes) featured Pierre-Robin (PRS). Patients who received a G-tube exhibited 9 (38%) major, 18 (75%) minor, and 9 (38%) multi-system comorbidities of which 9 (38%) were neuro-related, 15 (63%) respiratory, 5 (21%) cardiac, and 13 (54%) GI. These patients were more frequently male (62.5%, $p=0.01$), had public insurance (58.3%, $p=0.049$), were diagnosed with a syndrome (58.3%, $p<0.001$) and/or PRS (29.2%, $p<0.002$), and possessed more comorbidities (any major, minor or multi-system, all $p<0.001$). The presence of a minor comorbidity was associated with 2.4-times (95% CI 1.6, 3.5) increased aRR for a G-tube. Patients with PRS or any other syndrome, respectively, had increased risks for major (21 and 5.3) and minor (3 and 2) comorbidities.

Conclusions – Our findings demonstrate a strong association between syndromic status and overall complexity of care. While this study strengthens the role of syndrome and comorbidity as G-tube risk factors, syndrome was more predictive than the presence of other comorbidities. For patients with cleft palate and syndromic overlap, reliance on conservative management is possible, but overcoming feeding difficulties may require more emphasis on early surgical intervention.

Administering Blinatumomab via Continuous Intravenous Infusion in Pediatric Patients-A Single-Institution Retrospective Review

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Background: Blinatumomab, a CD19xCD3 bispecific T-cell engager, has become standard therapy for many pediatric patients with B-cell acute lymphoblastic leukemia (B-ALL). It significantly improves disease-free survival in these patients, in combination with chemotherapy. Blinatumomab is administered via a 28-day continuous intravenous (IV) infusion and thus presents logistical challenges for patients, families, and care teams. Here we describe the experience of blinatumomab administration in pediatric patients with B-ALL.

Methods: This retrospective review included all patients with B-ALL treated at Helen DeVos Children's Hospital (HDVCH) with continuous IV blinatumomab between January 1, 2018-December 31, 2024. Data was extracted from electronic medical records, de-identified, and managed using a Research Electronic Data Capture (REDCap) database.

Results: Thirty-one eligible patients were identified with a median age of 6 years (range, 6 months-20 years). The median distance from the patient's home address to HDVCH was 29.8 miles (range, 2-514 miles). Fifteen patients (48.4%) received blinatumomab on a Children's Oncology Group study from the HDVCH research pharmacy. Sixteen patients (51.6%) received blinatumomab from a commercial supplier. All patients received blinatumomab through a central venous catheter, the most common type being a single lumen port (79.7%). Twenty-two patients (71%) required peripheral IV access, often for antibiotics. We recorded zero hospitalizations or clinic visits for blinatumomab toxicity. Sixteen patients (51.6%) experienced at least one logistical issue requiring hospitalization or a clinic visit. Lines breaks or malfunctions were the most common issue, leading to hospitalization 85% of the time. Pump malfunction or alarms were the second most common issue, followed by port dressing changes, medication bag leak, and port malfunction. Pump malfunctions led to clinic visits 56.3% of the time. Three patients (9.7%) discontinued blinatumomab before completion of planned therapy due to logistical problems. After receiving blinatumomab, 26 patients (83.9%) required intravenous immunoglobulin (IVIG). The mean number of IVIG treatments was 5.2 (range, 1-19).

Conclusion: While safe, well-tolerated, and highly effective therapy for children with B-ALL, continuous IV blinatumomab requires numerous unplanned hospitalizations and clinic visits due to logistical complications. Blinatumomab therapy also frequently necessitates months of IVIG treatment. These results support further investigations into alternative methods of blinatumomab delivery and the impact of blinatumomab on immune function in pediatric patients with B-ALL.

Autonomy in Childbirth: Birthing Experiences for Black Women in Michigan

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Background: Autonomy in childbirth enhances the labor and delivery experience. Conversely, limited autonomy can foster fear, erode trust, and create negative outcomes that may exacerbate the disproportionate disparities for Black women, factors likely contributing to higher rates of maternal mortality. This collaborative study between Michigan Health & Hospital Association, Michigan Council for Maternal and Child Health, and Michigan State University sought to understand Black women's autonomy during birth/delivery in hospitals across three regions in Michigan.

Methods: A total of 54 individuals who delivered at selected hospitals in Michigan between 2021 and 2023 participated in either semi-structured interviews or focus groups. Interviews explore experiences across the full perinatal period, including pregnancy, labor, delivery, and postpartum care. Audio recordings were transcribed and analyzed, emphasizing patterns related to care coordination, continuity of care, relationships with providers, and broader health system influences.

Results: Experiences varied by level of autonomy in decision-making. Positive experiences occurred when birth plans were respected, patients felt in control, and providers supported shared decision-making. Conversely, negative experiences involved ignored preferences, pressure toward interventions, forced positioning, and poor communication, leading to confusion and distress. Cesarean perceptions varied where some viewed them positively when well-explained and collaborative, but negatively when perceived as coercive or unclear.

Conclusion: Autonomy and shared decision-making strongly influence birth experiences. Loss of autonomy, particularly during critical decisions, leads to negative perceptions even when outcomes are safe. Improving patient-centered communication and decision-making may enhance satisfaction and trust in maternal care.

Real-World GLP-1 Titration, Persistence, and Associated Clinical Outcomes

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Background: Real-world use of glucagon-like peptide-1 (GLP-1)–based therapies frequently involves titration, treatment interruptions, medication switching, and discontinuation. We characterized these treatment trajectories and evaluated their associations with the following weight-related outcomes: weight loss, body mass index (BMI), and hemoglobin A1c (A1c).

Methods: We conducted a retrospective analysis of 75,237 patients prescribed GLP-1–based therapy. Patients were classified by persistence, titration, medication switching, and treatment gaps. Clinical outcomes were compared across four groups: titrated and persistent, titrated and nonpersistent, nontitrated and persistent, and nontitrated and nonpersistent. Kruskal-Wallis tests and Bonferroni-corrected pairwise Mann-Whitney U tests were used to evaluate group differences, with additional analyses stratified by follow-up duration and number of orders.

Results: Overall, 16,994 patients (22.6%) had a single fill, 31,088 (41.3%) were persistent, and 27,155 (36.1%) were nonpersistent. Among nonpersistent patients, 4,282 (15.8%) switched within the same molecule, 14,422 (53.1%) switched across molecules, and 8,451 (31.1%) did not switch. Across the cohort, 35,970 patients (47.8%) reached maintenance, 15,241 (20.3%) remained in titration, and 24,026 (31.9%) discontinued before maintenance. Among those reaching maintenance, 29.3% subsequently discontinued.

Clinical outcomes differed significantly across the four titration-persistence groups for weight change ($P<10^{-243}$), BMI change ($P<10^{-196}$), and A1c change among patients with type 2 diabetes ($P<10^{-54}$). Titrated and persistent patients experienced the greatest mean reductions in weight (−5.1%), BMI (−4.9%), and A1c (−0.57 percentage points), followed by titrated and nonpersistent patients (−4.6%, −4.4%, and −0.51), nontitrated and persistent patients (−1.8%, −1.7%, and −0.18), and nontitrated and nonpersistent patients (−1.0%, −0.9%, and −0.09). Titration was associated with improved outcomes across follow-up periods, while the additional benefit of persistence among titrated patients became more apparent with longer follow-up. Findings were consistent after stratification by follow-up duration and number of orders.

Conclusions: GLP-1 treatment commonly follows a nonlinear trajectory, with frequent gaps, switching, and discontinuation before or after maintenance. Titration was the strongest marker of improved clinical outcomes, while persistence provided additional benefits, particularly over longer follow-up. Supporting patients during early treatment, titration, medication transitions, and coverage gaps may improve persistence and clinical outcomes.

Managing "Simple Toothache" in Children Presenting to the Emergency Department

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Background and Objectives: The incidence of antibiotic and opioid prescribing for pediatric patients presenting to emergency departments (ED) for dental pain without evidence of obvious infection is not well known. The purpose of this study is to examine ED prescribing patterns for the treatment of "simple toothache" in children.

Methods: This retrospective cohort analysis included consecutive pediatric patients (ages 1-19 years) diagnosed with dental pain without obvious infection (defined as fever, intraoral or extraoral swelling, purulence, or trismus). Patients were seen at seven emergency departments (ED) over a 48-month study period. We recorded clinical findings, ED treatment, and final disposition using an institutional honest broker system. Our study hypothesis was that both antibiotics and opioids are prescribed too frequently for the ED treatment of simple toothache in children. We used descriptive statistics (frequency tables, confidence intervals) to summarize the data.

Results: A total of 7114 ED patients presented with dental pain without obvious infection; 683 (9.6%) were pediatric patients. The average age was 11.6 $\pm$ 5.8 years. The 17- through 19-year age group had the highest rate of dental-related ED visits (33.1%). A higher proportion of Medicaid beneficiaries (66.6%) had dental visits than commercially insured (26.9%) or uninsured (6.5%). Virtually all had a documented primary care physician (99.0%). The most common diagnoses were nonspecific odontalgia (55.4%) or dental caries (33.7%). Providers prescribed an antibiotic, most often amoxicillin or penicillin, in 60.7% (95% CI 57.0% to 64.4%) of ED visits. Opioids, most often hydrocodone, were prescribed in 18.7% (95% CI 15.9% to 21.9%). Dental nerve blocks were performed in 43 patients (6.3%). Twelve percent of patients returned within 7 days requesting further analgesia.

Conclusion: The ED is a well-known safety net for children with a simple toothache who have no direct access to dental care. However, the recommended treatment for these patients is usually dental procedures rather than antibiotics or narcotics. Data-driven solutions, such as guideline implementation, provider education, use of nonsteroidal anti-inflammatory drugs, and dental nerve blocks could reduce medication-related harms and avert health care expenditures.

Developing Workshops to Enhance Self-Efficacy Among Patients in Cancer Survivorship: A Collaborative Partnership Between Physiatry and a Community Cancer Support Network

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Background: Cancer survivors face physical, emotional, and psychosocial challenges after treatment. There is evidence that rehabilitation can help restore function and quality of life in cancer survivorship; however, it is underutilized. This is attributed to a lack of awareness among clinicians and patients and a lack of clinical guidelines that incorporate rehabilitation. In 2021, Shah et al. demonstrated that their hope-enhancing workshop for breast cancer patients was feasible and efficacious; however, the benefits of workshops incorporating cancer rehabilitation have not been explored. This study evaluated the feasibility and preliminary effects of community-based educational workshops focused on cancer rehabilitation.

Methods: Cancer Rehabilitation Education and Wellness is a formal partnership between a national rehabilitation health system and a national cancer support organization to promote awareness of survivorship topics. This study included data collected from two workshops—one focused on exercise in cancer survivorship and one on cancer-related fatigue. Each session was one hour, with both in-person and virtual participation. The workshops were free and open to the public. They were led by resident physicians, skilled therapists, and social workers. The workshops incorporated slide-based content, an interactive session, and education on local resources. Participants were asked to complete optional pre- and post-workshop surveys. The primary outcome was feasibility, determined by attendance, and the secondary outcome was self-efficacy, assessed using an abbreviated Cancer Behavior Inventory.

Results: Feasibility was demonstrated by recruitment of 35 patients over 6 months, with 57% of patients completing both pre- and post-intervention surveys. Based on these data, patients reported statistically improved expression of negative feelings about cancer, greater content knowledge, and greater ability to perform daily activities following workshop participation.

Conclusion: Community-based rehabilitation workshops are feasible, well accepted by survivors, and integrate smoothly into provider workflows. This workshop model could be replicated by other health systems using a team-based approach, committed community partnerships, and hybrid workshop delivery to reach the greatest number of survivors and caregivers. This approach can help bridge the gap between survivorship rehabilitation needs and accessible community resources.

From Diagnosis to Research Readiness: A Parent-Led Implementation Model for Primrose Syndrome

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Background: Primrose syndrome is an ultra-rare, multisystem neurodevelopmental disorder caused by pathogenic variants on the gene *ZBTB20 (located at 3q13.31)*. Features include developmental, intellectual, and behavioral disabilities; macrocephaly; central nervous system abnormalities; seizures; hearing and vision impairment; skeletal and craniofacial differences; and endocrine, metabolic, and immune complications. The severity and combination of symptoms vary widely. Families report isolation, fragmented care, limited access to knowledgeable clinicians, and few coordinated opportunities to participate in research. Although resource platforms for genetic conditions such as Primrose syndrome exist, the lack of consolidated and up to date evidence create barriers to quality care and information for both patients and families affected.
Methods: Here we describe how a newly formed parent-led organization built a community and research-readiness infrastructure for Primrose Syndrome while integrating family articulated priorities with multidisciplinary scientific oversight. This is a retrospective descriptive implementation assessment of Beyond Primrose ZBTB20 Foundation activities from November 2025 through September 2026 was conducted. Activities and completed or initiated milestones were mapped across five domains: community engagement, governance, education and support, data infrastructure, and translational research. Outputs and time -to milestone- were summarized descriptively.
Results: Within 9 months, the initiative connected 88 affected families worldwide through a secure contact registry and established recurring virtual meetings. A centralized website was launched with information on Primrose syndrome, supportive care and surveillance, specialists, research participation, caregiver and sibling support, and financial and travel assistance. More recently, a communication platform has been implemented to allow families direct support and share experiences to better guide patient care. Research-readiness milestones included initiating an international, institutional review board-approved longitudinal natural history registry incorporating standardized measures; work to identify potential biomarkers; and establishing two complementary drug-repurposing collaborations using patient-derived fibroblast and RNA-based approaches, including a sibling control.
Engagement within the foundation has allowed for the development and planning of an “Innovation Summit” to allow affected families to gather and discuss their personal experiences, while also deepening their understanding of the clinical therapies available by hearing from knowledgeable providers of the field. The summit also presents a unique opportunity to provide families with the option of additional genetic testing to potentially provide families with more insight into genetic transmission and clinical treatment. Together, these efforts created coordinated pathways for community support, education, data contribution, biospecimen donation, functional studies, and therapeutic development.
Conclusions: A patient-led organization can build measurable research-readiness infrastructure on a compressed timeline when community engagement, multidisciplinary governance, education, data systems, and translational partnerships are developed in parallel. Consolidation of literature and data, along with lived experience, allows family utilization when communicating with providers is essential to producing therapeutically favorable outcomes globally. Additional gathering of lived experience data via discussion and surveys allow for a more objective understanding of individual impacts on treatments and outcomes, particularly due to the variation of presentation in each individual patient. Future evaluation should measure participation, representativeness, stakeholder experience, disease burden, and longitudinal outcomes.

Title: Targeting Protein Therapeutics to the Bone Surface – Elucidating Key Determinants of Accumulation, Retention, and Function

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Study goals:
While biologics have gained popularity as viable therapeutic approaches to treat various musculoskeletal diseases including osteoporosis and rheumatoid arthritis, there are concerns of unintended effects outside of the bone microenvironment, as evidenced by recent clinical trials. Localizing these therapeutics specifically to the bone surface may significantly enhance therapeutic efficacy and broaden the array of potential molecular targets through a precision targeting approach. The goal of this study is to identify the pharmacologic design parameters which affect the localization of potential protein therapeutics to the bone surface, including affinity, avidity, and circulation time.

Methods:
To investigate how a site-specifically attached peptide will increase bone surface targeting, we attached two different affinity ligands (a deca-aspartate (D_{10}) or bisphosphonate (BP)) to the fluorescent protein mCherry and analyzed the biodistribution to the bone surface of these constructs. Next, we sought to increase the blood circulation time of our targeted protein by creating an mCherry-human IgG_1 Fc fusion protein with our affinity ligand appended to each C-terminus. Finally, we investigated the role of avidity in bone surface targeting by examining the difference in adding one versus two D_{10} affinity ligands to the C-terminus of an antibody.

Results:
The results of a biodistribution experiment *in vivo* demonstrated that both BP- and D10-modified mCherry showed a selective accumulation in skeletal tissues at 4 hours post-injection, confirmed with confocal imaging. Plasma half-life of our bone targeted construct was successfully increased after fusing mCherry to human IgG_1 Fc, demonstrated by pharmacokinetics of the blood *in vitro*. Further, we demonstrated that there is a difference in bone surface targeting in the femur and vertebrae when using one versus two D_{10} affinity ligands at 24 hours post-injection.

Discussion/conclusion:
Given the challenges of targeting the mineralized surface of the bone due to lack of obvious protein targets, our fusion protein with a peptide affinity ligand, D_{10}, can provide efficient and effective ways to deliver potential therapeutics to the bone surface by charge affinity. We demonstrated that fusion of the D_{10} affinity ligand to a model protein increases therapeutic loading at the bone surface. We further demonstrated that loading is significantly enhanced by a combination of avidity and circulation time. These findings elucidate the critical molecular design parameters to localizing therapeutic protein cargo within the bone microenvironment. Based on the mechanism of action of a particular molecular target, varied pharmacokinetic and pharmacodynamic parameters may be desired.

Investigating the Underlying Mechanisms of Nicotine-Induced Intraplaque Hemorrhage

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Background: Electronic cigarettes have surged in popularity and are often promoted as safer alternatives to traditional cigarette smoking, but the cardiovascular consequences of e-cigarette use remain poorly understood. Nicotine, the primary component of e-cigarettes, has emerged as a key driver of atherosclerosis, a direct precursor to myocardial infarction (MI) and stroke. Within these atherosclerotic lesions, intraplaque vessels are often structurally immature and prone to rupture, leading to intraplaque hemorrhage (IPH).

Objective: Nicotine has been shown promote intraplaque hemorrhage, but the molecular mechanisms that drive this process remain unclear. Recent work from our lab demonstrated that TNF-a induces LRG1 expression in endothelial cells, driving pathological angiogenesis and intraplaque hemorrhage in the context of cancer. Given nicotine's capacity to increase circulating TNF-a, we hypothesize that nicotine promotes intraplaque hemorrhage through a similar TNF-a/LRG1 angiogenic axis.

Methods: To test this, we administered high-fat diet at 10 weeks of age to ApoE-/- mice, followed by tandem stenosis surgery to introduce atherosclerotic plaque in the carotid artery. We then subcutaneously exposed these mice to nicotine at 3 mg/kg/day and harvested arterial tissue samples six weeks later.

Results: Gross morphological characterization of harvested carotid arteries revealed visually apparent increases in intraplaque hemorrhage in nicotine-treated mice compared to control mice. Further histological analysis of these plaque sections confirmed these preliminary findings, with significantly increased IPH incidence in nicotine-exposed mice compared to controls. We also plan to employ immunostaining for markers of angiogenesis (CD31), macrophage burden ($Ly6C^{hi/lo}$), and the TNF-a/LRG1 pathway to reveal molecular mechanisms that link nicotine to IPH.

Conclusion: These results help reframe nicotine-induced cardiovascular disease as a targetable molecular process. Nicotine harnesses several mechanisms in parallel that elicit angiogenic and inflammatory processes within the plaque environment. Future directions can leverage these findings to develop therapeutic strategies to mitigate the harmful vascular effects of nicotine exposure.

Title:Chronic Dermatologic Conditions and Their Association With Perceived Academic Impairment Among Medical Students

Author(s):Camellia Nosrat, medical student; Kermanjot Sidhu, medical student; Faheed Shafau, medical student Dr. Padley, PI; Dr. Trottier, PI

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Abstract:

Context
Medical students with chronic dermatologic conditions such as acne, eczema, or psoriasis may experience added psychological and social burden. Visibility and stigma can contribute to self-consciousness, anxiety, and social withdrawal, while chronic stress can trigger or worsen inflammatory skin symptoms. Although the psychological effects of dermatologic conditions are increasingly recognized, their relationship with medical students' academic functioning remains less understood.

Objective
To evaluate the association between chronic dermatologic condition burden and perceived academic impairment among medical students.

Design
Cross-sectional survey study.

Setting and Participants
Medical students of all class years across Michigan medical schools with a current dermatologic condition that has been present or recurrent for at least 3 months.

Instrument
An online questionnaire assessing dermatologic condition characteristics, dermatology-related quality-of-life burden using the Skindex-16, and perceived academic impairment.

Outcome Measures
Perceived academic impairment will be assessed using Likert-scale questions evaluating the extent to which a participant's dermatologic condition affects concentration, study efficiency/productivity, attendance or participation in required academic activities, participation in clinical activities or patient interactions, completion of academic responsibilities, and overall perceived academic performance. Higher scores indicate greater perceived impairment.

Results
This research is currently in progress. We hypothesize that greater dermatologic burden will be associated with greater perceived academic impairment, including worse concentration, lower study efficiency, and greater interference with academic activities.

Conclusion
This study addresses the underrecognized academic impact of chronic dermatologic conditions among medical students. Findings may increase awareness of their functional consequences and help inform future academic support and wellness resources for
affected students.

Early Postoperative Cognitive Outcomes Following Awake Surgery Under Local Anesthesia: A Prospective Cohort Study

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Background: Postoperative cognitive dysfunction (POCD) is a common complication of surgery in older adults and carries associations with impaired recovery, reduced quality of life, and increased long-term mortality. Whether surgical trauma or systemic anesthetic exposure drives early cognitive decline remains unresolved, because nearly all surgery involves both. Awake surgery under pure local anesthesia separates the two exposures, subjecting patients to surgical trauma while withholding systemic sedation. This study evaluated early cognitive outcomes in that setting.

Methods: We conducted a prospective observational cohort study of adults aged 50 years and older undergoing elective plastic surgery entirely under local anesthesia without sedation between August 2024 and June 2026. Eligible procedures included blepharoplasty, facelift, and neck lift. No patient received premedication, anxiolytics, opioids, or intravenous sedatives. Trained examiners administered the Montreal Cognitive Assessment (MoCA) preoperatively (version 8.1) and one week postoperatively (version 8.2). Age- and education-matched nonsurgical controls completed testing over the same interval. We defined cognitive decline a priori as a decrease of 3 or more MoCA points. Linear mixed-effects models tested time, study group, the time-by-group interaction, and age as fixed effects.

Results: Fifty surgical patients aged 50 to 87 years (mean 66.5 ± 9.9) and 50 controls (mean 67.3 ± 10.6) completed follow-up. Procedures comprised isolated blepharoplasty (n = 29) and facelift or neck lift with or without blepharoplasty (n = 21). Mean MoCA scores rose slightly in both groups, from 25.91 to 26.37 in surgical patients and from 25.15 to 25.31 in controls, and the time-by-group interaction did not reach significance ($p = 0.198$). A decline of 3 or more points occurred in one participant per group (2%). Age predicted lower scores independently, with an estimated decrease of 0.13 points per additional year ($p < 0.001$). Among surgical patients, the time-by-procedure interaction was also nonsignificant ($p = 0.482$), despite combined cases lasting 6 to 8 hours.

Conclusion: Surgery performed under local anesthesia alone showed no association with early postoperative cognitive decline, even after extensive procedures in patients into their ninth decade. Surgical trauma by itself may be insufficient to produce early POCD, which supports systemic anesthetic exposure as the more likely contributor and identifies awake technique as a strategy worth further study in cognitively vulnerable surgical patients.

Title: Comparative Outcomes of Secondary Speech Surgery Techniques for Velopharyngeal Insufficiency Following Cleft Palate Repair

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Introduction:
Velopharyngeal insufficiency (VPI) is a common cause of speech and psychosocial impairment following cleft palate repair (Kummer, 2014). Although several surgical techniques address velopharyngeal dysfunction through distinct anatomical principles, comparative outcome data among the various surgical techniques remain limited, particularly speech outcomes and revision rates. This study compared outcomes by secondary speech surgery technique in pediatric patients with VPI after palatoplasty.
Methods:
A retrospective cohort study included pediatric patients at a single institution who underwent secondary speech surgery for VPI diagnosed after cleft palate repair between 2007 and 2022. Patients underwent pharyngeal flap, sphincter pharyngoplasty, or buccal flap palate-lengthening procedures. Demographic and clinical data were collected relating to pre- and postoperative speech and airway quality. Hypernasality was graded by speech-language pathologists as none, mild, moderate, or severe. Changes in hypernasality severity, residual or recurrent VPI, revision surgery, and sleep apnea were compared across techniques. Wilcoxon signed-rank tests were used, with $p<0.05$ considered significant.
Results:
Sixty-eight pediatric patients underwent speech surgery for VPI post-palatoplasty, including pharyngeal flap (n=56), buccal flap palate-lengthening (n=8), and sphincter pharyngoplasty (n=4). One patient was lost to follow-up. The median age at formal VPI diagnosis was 5.4 years (IQR: 4.4-7.5), occurring a median of 4.6 years (IQR 3.4-6.6) after palatoplasty. Overall, speech surgery resulted in significant improvement in hypernasality severity ($p<0.001$), with 82.9% demonstrating improvement, 14.6% remaining unchanged, and 2.4% (n=1) worsening. Patients undergoing pharyngeal flap demonstrated greater reduction in hypernasality severity than those undergoing buccal flap palate-lengthening procedures (median reduction: 2 vs. 0 grades, $p=0.017$) and all non-pharyngeal flap techniques combined ($p=0.029$). No significant difference in hypernasality improvement was observed between pharyngeal flaps and sphincter pharyngoplasty alone ($p=0.340$). Residual or recurrent VPI occurred in 17.9% of patients, and 16.2% required revision speech surgery. Postoperative sleep apnea prevalence remained the same at 14.9% postoperatively, although equal numbers of patients experienced onset and resolution. No statistically significant differences in residual VPI, revision surgery, or sleep apnea rates were observed among surgical techniques (all $p>0.05$).
Discussion/Conclusion:
Secondary speech surgery for VPI significantly improved hypernasality among pediatric patients with VPI after cleft palate repair. Pharyngeal flap demonstrated greater improvement of hypernasality compared to buccal flap palate-lengthening procedures without increasing postoperative sleep apnea. Residual VPI and revision rates were comparable across techniques. This study demonstrates the efficacy of secondary speech surgery following initial cleft palate repair in resolving symptoms of VPI. However, the predominance of pharyngeal flap procedures and the small sphincter pharyngoplasty and buccal flap cohorts may have reduced the ability to detect differences in less frequent outcomes. Larger multicenter studies with more balanced surgical cohorts are needed to better compare effectiveness among speech surgery techniques.

A Community-Based Study: Understanding Mental Health Help-Seeking Behavior and Barriers Among Southeast Asian Americans in Michigan

AUTHORS
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BACKGROUND
Asian Americans utilize mental health services at lower rates than other ethnic groups. Many Southeast Asian (SEA) Americans are refugees with higher rates of trauma and mental health issues which remain understudied. Prior studies show lower mental health service use among SEA populations compared to other Asian subgroups, with differences between USA-born and immigrant Asian Americans. The Integrated Model of Mental Health Seeking highlights cultural influences, attitudes, perceived norms, and personal agency as determinants of help-seeking behavior. This study explores the effect of these factors on mental health service utilization of SEA communities in Michigan.

METHODS
An anonymous cross-sectional survey was developed using validated instruments assessing mental health knowledge, attitudes, autonomy, stigma, help-seeking behavior, and community needs. SEA participants were recruited via convenience sampling at community events. Surveys were administered in English, Lao, Thai, or Vietnamese. Pearson correlation assessed relationships among key variables, while Wilcoxon compared generational and ethnic differences with a statistical significance of $p<0.05$.

RESULTS
Among respondents (n = 31), no statistically significant associations were found between mental health knowledge, attitudes, stigma, and help-seeking behaviors. However, perceived barriers were common: 48.39% cited financial concerns, 35.48% preferred culturally concordant providers, and 32.26% reported limited familiarity with mental health resources. Other influential barriers included confidentiality concerns and language. First-generation SEA Americans (n = 20) were less familiar with resources ($p = 0.017$) and more concerned about confidentiality ($p = 0.010$) than non-first-generation participants (n = 11). Thai participants (n = 13) reported greater confidentiality concerns than Laotian participants (n = 9; $p = 0.034$).

CONCLUSION
Our findings highlight the cultural heterogeneity within SEA communities and limitations of treating Asian Americans as a homogenous group. These results support the need for culturally and linguistically tailored mental health services that address structural barriers. We demonstrate the feasibility of community-based mental health research among SEA Americans in Michigan. Further studies are needed to examine how individualized services improve mental health utilization by incorporating this understanding of subethnic and generational differences.

Fetal Delivery Method and Number of Live Births in Patients with Spinal Cord Injuries (SCI)

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Introduction:
Spinal cord injuries (SCI) can occur in women of reproductive age. Due to the rarity of SCI in pregnancy, providers aren't frequently encountering obstetric care for these patients which likely lowers comfortability providing prenatal and intrapartum care. We aim to investigate the rate of pregnancy and live births in patients with spinal cord injuries (SCI) in an attempt to advocate for

Methods:
The National Spinal Cord Injury Statistical Center (NSCISC) public database was utilized for this study. This database contains deidentified data from patients with spinal cord injury entered between 1973 and 2021. Exclusion criteria were male patients, lack of entry for number of pregnancies and/or number of live births variables, and patients with an unknown number of pregnancies and/or live births. Descriptional statistics of range, mean, and median were utilized for this study.

Results:
Of 32,541 patients entered into the database, 2441 were included. The number of pregnancies ranged from 0 to 12 with a majority having 0 pregnancies. The average number of pregnancies per patient was 1.828 and the median was 2. The number of live births ranged from 0 to 10 with a majority having 0 live births. The average number of live births was 1.816 and the median was 2.

Discussion/Conclusion:
The number of live births in patients with SCI is similar to the national average of 1.62 for all pregnant patients showing that SCI may not be a barrier to pregnancy and live birth in this population. Due to the unique presentation of each patient with a SCI, pregnancy care for this population may require a multidisciplinary healthcare team that encompasses providers with thorough knowledge and training. As a result, it is vital to acknowledge that counseling may be different for pregnant patients with SCI compared to pregnant patients without SCI. All obstetric providers should be educated on protocol and common complications for pregnancy in patients with SCI and be aware of resources for this population in an effort to reduce care gaps and improve the overall patient experience. This study was limited by the use of a public data set which limited the extent of the analysis, the lack of pregnancy information entered for many women in the database, and the overall rate of SCI being lower in women.

Risky Business on TikTok: Qualitative Analysis of Hazardous Substance and Alcohol Challenges Among Youth

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Background and Objectives: TikTok's rapid growth has been accompanied by an increase in viral challenges, some of which encourage adolescents and young adults to engage in hazardous behaviors such as ingesting toxic substances, misusing over-the-counter medications, and consuming alcohol in dangerous ways. This study systematically characterizes these TikTok challenges, evaluates their medical risks, and explores how such content can inform clinical education and public health prevention efforts.

Methods: This qualitative content analysis examined TikTok videos depicting harmful or potentially harmful challenges, identified through TikTok search hashtags and supplemented by regulatory and toxicology sources. Eligible videos (with audio, non-duplicate, and visually or verbally representing a challenge) were transcribed verbatim, anonymized, and coded by two independent researchers using standardized abstraction forms capturing challenge characteristics, routes of harm, substances involved, documented complications, demographic targeting, dissemination patterns, and associated warnings or advisories. We classified safety suggestions or health information in videos as misinformation or disinformation based on consensus ratings from four board-certified emergency physicians.

Results: Forty-five TikTok videos met inclusion criteria; 38 (84%) represented highly prevalent youth challenges (>30,000 views). Most depicted participants were adolescents or young adults; 34% were identifiable as teens or preteens, and 53% were male. All identified challenges were judged medically dangerous by clinical reviewers and were associated with potential outcomes including burns, poisoning, seizures, arrhythmias, coma, and death, consistent with case clusters reported by pediatric burn centers and emergency departments. Platform administrators subsequently banned 19 (42%) challenges—such as the Tide Pod, Dusting/Chroming, Benadryl, and Nutmeg challenges—following multiple deaths and poisonings; however, all banned challenges continued to circulate through user re-uploads. Medical misinformation or disinformation was identified in association with every challenge analyzed.

Conclusions: Hazardous TikTok challenges are widely disseminated, highly engaging, and disproportionately involve adolescents and young adults, driving behaviors with substantial risk of severe toxicity and injury. The persistence of banned challenges through re-uploads, along with pervasive misinformation and disinformation, highlights critical gaps in platform moderation and health communication.

Title: A retrospective analysis of total operating room time in rhinoplasties and septorhinoplasties in the MOVER database

Rachel Westphal
Michigan State University College of Human Medicine

Introduction: Rhinoplasties can be associated with a varied number of indications and a variable amount of time in the operating room. I investigated time in the operating room (OR) and patient age, body mass index (BMI), American Society of Anesthesiologists (ASA) physical status class, and number of diagnoses.
Methods: A single-center retrospective analysis was conducted using the Medical Informatics Operating Room Vitals and Events Repository (MOVER) database. 36 patients who underwent rhinoplasty, rhinoplasty with augmentation, or septorhinoplasty at the University of California Irvine Medical Center between March 2018 and December 2022 were included. Patients lacking a substantial amount of data were excluded. As some diagnostic codes overlapped, the number of diagnoses was determined by fitting diagnosis codes into distinct categories. Time in the OR and patient age as well as body mass index (BMI) were analyzed using coefficients of determination, while the ASA class and number of diagnoses were analyzed using one-way ANOVAs.
Results: Patient age and BMI were not associated with time in the OR. Increasing ASA class was associated with a statistically significant increased time in the OR (354.6 vs. 418.9 vs. 458 minutes, $p<0.05$). Number of diagnoses (1-4) was not correlated with time in the OR; however, when this was categorized into 1-2 diagnoses 1-2 and 4-5 diagnoses (excluding the one patient with 3), there was a statistically significant increased time in the OR with higher number of diagnoses (363.5 [330.4-396.6] vs. 424.3 [368.1-480.4] minutes, $p<0.05$).
Conclusion: While this study was small, it suggests potential associations between time in the OR and ASA class as well as between time in the OR and number of diagnoses. Future work should investigate this with a larger number of rhinoplasty and septorhinoplasty patients.

Title: Identifying Hospital System Factors Influencing Birth Experiences Among Black Women in Michigan

Authors: Laila Zatar[1], Emma Clifford[1], Rachel Kallemeyn[1], Lenise Freeman[2], Gayle Shipp, PhD, RD[3]

1 Michigan State University, College of Human Medicine, Grand Rapids, MI
2 Michigan Health & Hospital Association, Lansing, MI
3 Charles Stewart Mott Department of Public Health, Michigan State University, Flint, MI

Background:

Continuity of care and care coordination are essential to patient-centered childbirth, yet hospital-based labor and delivery often involves provider transitions, time pressures and inconsistent processes that can disrupt care. These system-level factors may disproportionately affect birth experiences among Black women. In collaboration with the Michigan Health and Hospital Association, Michigan Council for Maternal and Child Health, and Michigan State University, this study examines how hospital-level dynamics shape birth experiences among Black women in Michigan.

Methods:

This study included Black women from Michigan who delivered at one of three selected hospitals between 2021and 2023. Participants engaged in focus groups or semi-structured interviews reflecting on experiences across pregnancy, delivery, and postpartum (n = 54). Audio recordings were de-identified, transcribed, and analyzed using thematic analysis to identify system-level factors influencing birthing experience.

Results:

Participants identified structural barriers, including limited continuity and poor care coordination, as primary drivers of uncertainty and diminished trust. Reoccurring staff changes and time pressures contributed to rushed, dismissive care, and delayed responses. Inconsistent implementation of birth preferences further undermined patient experience. Conversely, responsive communication and supportive care were essential for fostering comfort, confidence, and trust.

Conclusion:

Findings highlight key hospital level drivers of birth experience. Improving continuity and strengthening care coordination are essential to rebuilding patient trust and reducing uncertainty. Addressing these structural factors may enhance the overall birthing experience and contribute to improved quality and equity in maternal care.

Identification of Potential Predictors for Treatment Effectiveness of Ranibizuma in Patients with Diabetic Macular Edema

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Purpose: Anti-VEGF (Vascular Endothelial Cell Growth Factor) drugs are the standard care for treatment of patients with diabetic macular edema (DME). Despite the success of anti-VEGF therapy roughly 30% of patients with DME do not respond properly to this type of therapeutic approach. Thus, there is a pressing need to understand factors influencing the effectiveness of anti-VEGF drugs, the aim of this project.
Materials and Methods: Diabetic patients (n=10) aged ³18 years with central diabetic macular edema, BCVA >24 and <78, and central macular thickness (CMT) greater than 250 mm were enrolled in this study (ML39638). Following a full eye exam, imaging, and an aqueous tab, patients received ranibizumab (0.3mg/0.05mL) injections at day one and weeks four and eight. At week 12, a full eye exam, imaging, and a second aqueous tab was obtained. Pre- and post-treatment aqueous humor samples were then analyzed using Milliplex MAP magnetic bead assays.
Results: As expected, ranibizumab lowered levels of VEGF-A (p=0.0200), decreased CMT (central macular thickness, p=0.0480), and improved VA (visual acuity, p=0.0190). Data analysis showed that the drug either had an immediate effect on vision parameters within 4 weeks after the first injection or none at all. Several pro-inflammatory mediators seemed to influence ranibizumab's effectiveness in improving CMT. For example, baseline levels of interferon-g correlated significantly with reduction in CMT (r=0.6490, p=0.0423). Antihypertensive medications overall demonstrated a more favorable outcome compared to normotensive patients.
Conclusions: Ranibizumab's effectiveness can be determined within the first four weeks of therapy. Its effectiveness is greatly influenced by baseline levels of specific pro-inflammatory mediators. Fully identifying those pro-inflammatory mediators and their critical baseline levels will help to predict outcome of anti-VEGF therapies early in the treatment of diabetic macular edema.

ML39638 Clinicaltrials.gov

Abstract Title:
Addressing Trust Gaps and Improving Communication in Maternal Healthcare: Enhancing Birthing Experiences for Black Women in Michigan

Authors: Emma Clifford[1], Rachel Kallemeyn[1], Laila Zatar[1], Lenise Freeman[2], Dr. Gayle Shipp[3]
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2 Michigan Health & Hospital Association, Lansing, MI
3 Charles Stewart Mott Department of Public Health, Michigan State University, Flint, MI

Background:
Black women in Michigan face a disproportionate risk of death during childbirth and they account for 43% of maternal deaths. Nationally, mortality rates are 2.6 times higher for Black women. These disparities reflect inequities in maternal care and a critical trust gap shaped by communication, autonomy, and care experiences. This study aimed to identify patient-informed strategies to improve care and strengthen trust among Black women in Michigan.

Method:
Hospitals were selected for sampling based on maternal mortality and morbidity trends. Eligible criteria included adult women (18 years or older) who delivered in sampled hospitals between 2021–2023 (n=54) were invited to participate in qualitative interviews focused around their pregnancy, labor/delivery, and postpartum experiences. Interviews were recorded, transcribed, and analyzed using theoretical thematic analysis.

Results:
Participants identified key strategies to improve trust and care. Experiences were strongly shaped by patient care experiences. Positive encounters involved proactive, compassionate, patient-centered care that increased trust and reduced anxiety, while negative experiences were marked by delayed communication, dismissal of concerns, and inadequate explanation of care, leading to fear and diminished trust. Thematic strategies include personalized and responsive care, greater provider flexibility, the need for improved communication, and postpartum support.

Conclusion:
Participant experiences align with existing research, reinforcing the urgent need to improve the safety and quality of birthing care. These findings highlight persistent barriers and suggest that even small improvements in attentiveness, communication, and respect for patient autonomy can meaningfully strengthen patient trust.

Trends, Disparities, and Outcomes in Molecular Testing for Metastatic Urothelial Carcinoma

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2. Henry Ford Hospital, Detroit, MI

Background: Urothelial carcinoma is the 6th most common cancer in the U.S. Recent approval of biomarker-driven therapies has expanded treatment options for urothelial carcinoma, increasing the relevance of molecular testing. However, trends in molecular testing utilization, particularly among racially diverse populations, remain understudied. This study evaluates molecular testing patterns and associated survival outcomes from Jan 2013–Dec 2025 at an urban academic center serving a diverse patient population.

Methods: This retrospective study stratified patients with metastatic urothelial carcinoma by gender, race, and molecular testing status. Testing rates were assessed annually and overall. Kaplan-Meier estimates for overall survival (OS) and progression free survival (PFS) were compared using log-rank tests. Categorical variables were analyzed using chi-squared tests, with $p<0.05$ considered significant. Progression was defined as radiographic progression, clinical progression, or death.

Results: Among 142 total patients, 19% were African American, 78% Caucasian American, 30% female, and 70% male. Molecular testing rates were similar among African Americans *vs* Caucasian Americans (63% *vs* 61%, p=0.34) and females *vs* males (63% *vs* 59%, p=0.64). A statistically significant increasing trend was observed in both the number of patients evaluated and proportions tested per year. From 2013-2019, 43% of 37 patients received molecular testing *vs* 66% of 102 patients from 2020-2025 (p=0.017). Among patients with documented testing timing (n=81), testing occurred most frequently at metastatic diagnosis (59%), followed by progression (27%), and initial diagnosis (14%). The most common reason testing was not completed was no documentation of discussion in the electronic medical record. PFS did not differ between tested *vs* untested patients (p=0.801). OS was numerically longer but not significant among tested *vs* untested patients (56.6 *vs* 28 months, p=0.159).

Conclusions: This real-world analysis characterizes temporal trends and demographic characteristics in molecular testing for metastatic urothelial carcinoma in the setting of evolving treatment paradigms. Findings demonstrate a statistically significant increase in patients seen and proportions tested over a 13-year span, supporting a potential correlation between increased testing with the advent of increased biomarker-driven therapies. No significant differences were seen in molecular testing rates among racial or gender demographics groups. Significant differences were not seen in OS and PFS, likely due to sample size limitations. With about a third of patients still not receiving testing, these results indicate further research and interventions needed to broaden molecular testing for patients with metastatic disease.

Postural Orthostatic Tachycardia Syndrome (POTS): A Syndrome Multiple

Dissertation Defense – Emma G. Zblewski
Michigan State University, College of Human Medicine and Department of Anthropology

Postural Orthostatic Tachycardia Syndrome (POTS) is an illness concept that has existed in its current form in biomedicine since the 1990s but has increased steadily in its presence in biomedical research and the public consciousness since the mid-2010s and *precipitously* increased after 2020 due to its connection with long-COVID. There is significant disagreement both in professional circles and among lay people regarding the boundaries of this concept, as well as significant contention over challenges to authoritative knowledge production by patients through only activism and discourse. This is an underserved condition, with patients reporting difficulties obtaining appropriate medical care.

In this dissertation, I present my study of irreducible complexity of POTS, attempting to pick apart its historical construction in biomedicine, the epistemological and physiological reality, the divorcing of shared meaning of key concepts due to digital biosocial media discourse, and the sometimes-overlapping perspectives of patients, researchers, and clinicians. A thorough study of POTS highlights the failures of American healthcare infrastructure and its consequences, the discomfort in American biomedicine with uncertainty and mind-body connections, and the tensions in biomedicine with what patients expect from it and what individual actors are able to deliver. To carry out my study, I used a mixed-methods approach in addition to my long-term autoethnography of my experience as a clinician anthropologist in training and a person diagnosed with POTS: 1) participant-observation at professional society and patient advocacy organization conferences; 2) an online survey of POTS patients, including soliciting free-response perspectives; 3) discourse analysis of social media activity on Reddit, Facebook, and TikTok; and 4) semi-structured interviews of researchers and clinicians studying and treating POTS. In this project, I apply a medical anthropological perspective to the study of an emerging, chronic, largely invisible illness, and contributes to the anthropological study of the impact of the digital public sphere on contemporary biomedicine, embodied in patients and clinicians alike. I identify how major assumptions about POTS and lack of conceptual clarity affects patient outcomes, how the lack of understanding of the digital POTS biosocial media and the competing narratives and knowledge produced within these spaces contributes to deteriorating trust between the lay public and biomedical clinicians, and potential targets for addressing problems with clinical POTS care at the individual patient level, and at the larger system level.

Title: Even the Machines Disagree: CPT Coding Variability in Craniofacial Surgery Presents in Large Language Models

Authors: Lindsey M. Jurecki, BS[1,2], Ashlie A. Elver, MD[2], Ian C. Hoppe, MD[2]

1. Michigan State College of Human Medicine

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Background

Accurate Current Procedural Terminology (CPT) coding supports appropriate reimbursement and consistent reporting of surgical procedures. In craniofacial surgery, the limited availability of procedure-specific codes may contribute to variability in coding practices. As large language models (LLMs) are increasingly explored for applications in medical billing, their performance in procedures without a single, clearly defined CPT code remains understudied. This study evaluates the precision and consistency of independent LLMs in generating CPT codes for craniofacial procedures and explores their potential utility in supporting standardized code selection.

Methods

An observational study evaluated the performance of four LLMs (ChatGPT, Claude, OpenEvidence, and Gemini). De-identified operative dictations from 18 craniofacial procedures were submitted to each model using a standardized prompt: “Please provide the appropriate 2026 CPT code for...” followed by the operative dictation. Primary and additional CPT codes generated by each model were recorded, along with modifier recommendations when provided.

Results

The four LLMs reached unanimous agreement on the primary CPT code for 7 of 18 (38.9%) craniofacial procedures, all of which had well-defined CPT codes. For cleft lip repair, all models selected the same primary code but differed in whether an adjunctive rhinoplasty code was included when applicable. Double-opposing Z-plasty palatoplasty resulted in three different primary CPT codes across the four models. Among cranial vault procedures, three of four models selected a craniofacial-specific code for fronto-orbital advancement. Differences in the inclusion of additional codes, including temporalis flap, occlusal splint, bone graft harvest, and adjunctive rhinoplasty code, occurred in 6 of 18 cases (33.3%), with Claude and Gemini more frequently providing additional codes.

Conclusions

LLMs demonstrated consistency in CPT selection when well-defined procedure codes are present, while variability increased for procedures with less clearly defined coding pathways. These findings suggest that current LLMs may have limited utility for independent CPT code selection in craniofacial surgery, particularly when coding requires interpretation or selection among multiple potential codes. As artificial intelligence is increasingly incorporated into medical billing, including coding queries after surgeon selection, efforts to clarify and standardize coding for craniofacial procedures are needed to avoid undervaluation of specialized procedures.

REVIEWS

Title: Comparative Outcomes of Quadriceps Tendon, Hamstring Tendon, and Bone–Patellar Tendon–Bone Autografts in Adolescent Athletes Undergoing ACL Reconstruction: A Systematic Review

Author(s): Charles Woodhams, Adam Haddad, Griffin Gleeson, Brian Tani, Nicolas Medel, Micah Lissy, Caesar Abaas (Presenting Author)

Affiliation(s): SSMORGs

Abstract:

Background: Anterior cruciate ligament (ACL) injuries are increasingly common among adolescent athletes, who face graft rupture rates 2.5–3.5 times higher than adults, and autograft choice — quadriceps tendon (QT), hamstring tendon (HT), or bone–patellar tendon–bone (BPTB) — is the only modifiable factor influencing surgical outcome. While graft comparisons are well established in adults, existing pediatric systematic reviews have focused almost exclusively on skeletally immature patients with physeal-sparing techniques, and the most comparable prior work pooled graft-failure rates without addressing return to sport, strength recovery, or complications. This review compared return to sport (the primary outcome), graft failure, strength recovery, patient-reported outcomes, and complications among QT, HT, and BPTB autografts in patients under 20 years undergoing primary ACL reconstruction (ACLR).

Methods: This systematic review followed PRISMA 2020 guidelines and was prospectively registered on PROSPERO (CRD42026135276). PubMed/MEDLINE, Embase, and Web of Science were searched from March 2006 to March 2026 (2,497 records identified; 719 duplicates removed). Eligible studies enrolled patients younger than 20 years undergoing primary ACLR with a QT, HT, or BPTB autograft and reported at least one outcome of interest; both comparative and single-graft studies were included, while allograft-only cohorts and mixed-age or hybrid-graft cohorts whose adolescent- or autograft-specific outcomes were not separable were excluded. Two reviewers independently screened records and extracted data, with disagreements resolved by a third reviewer. Given anticipated methodological heterogeneity, findings were synthesized narratively rather than pooled statistically.

Results: Of 1,778 screened records, 54 full texts were assessed and 51 studies were ultimately included (3 BPTB, 3 QT, 28 HT, 17 multi-graft comparative), predominantly Level III retrospective cohorts; no randomized trials were identified. Return to sport was high across all three grafts with no graft-attributable difference (the only dedicated QT adolescent cohort reported 100%), and structured rehabilitation, rather than graft type, was the strongest predictor of return. Hamstring tendon carried the highest graft failure rate: national registry data showed a two- to threefold higher revision risk versus BPTB (adjusted hazard ratio 2.8), corroborated by the only methodologically independent adolescent comparison (10.2% vs. 0% in patients 13–15 years, p=0.03), while the largest QT-versus-HT cohort found lower rupture with QT (7.2% vs. 23.2%; odds ratio 0.29). Strength recovery followed a consistent donor-site-specific pattern: QT harvest produced a quadriceps deficit while sparing the hamstrings, HT harvest produced a hamstring deficit while sparing the quadriceps, and BPTB produced a quadriceps deficit with hamstrings essentially intact (limb symmetry index 103.85%). Patient-reported outcomes did not differ meaningfully by graft, though reporting was concentrated in HT cohorts. Complications tracked harvest site — HT produced persistent hamstring weakness and numbness, QT produced suture granuloma (13.8%) and symptomatic hardware (6.9%) — and no included BPTB study reported anterior knee pain, the complication most associated with BPTB harvest in adults.

Conclusion: In adolescents undergoing primary ACL reconstruction, graft choice did not determine return to sport or patient-reported outcomes, but it did dictate a predictable, donor-site-specific strength trade-off, with hamstring tendon carrying the highest failure risk, particularly in the youngest patients. Because the evidence base remains almost entirely Level III and hamstring-dominant, and because BPTB's principal known morbidity (anterior knee pain) has not been measured in this population, no single graft can yet be recommended as optimal for all adolescent athletes. Graft selection should instead be individualized to each athlete's sport-specific strength demands, pending higher-quality prospective studies with standardized outcome and rehabilitation reporting.

GLP-1 Receptor Agonists Versus SGLT2 Inhibitors as Add-On Therapy to Metformin in Adults With Uncontrolled Type 2 Diabetes: A Focused Evidence Review

Evan Adamski, Migdalisel Colon-Berlingeri PhD.

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Background: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and sodium-glucose cotransporter-2 (SGLT2) inhibitors are commonly considered as add-on therapies for adults with type 2 diabetes mellitus (T2DM) that remains inadequately controlled on metformin. Both classes improve glycemic control and can promote weight loss, but their relative efficacy is clinically relevant when obesity and elevated HbA1c are major treatment concerns. This review evaluated whether GLP-1 RAs provide greater reductions in HbA1c and body weight than SGLT2 inhibitors in adults with uncontrolled T2DM receiving metformin.

Methods: PubMed was searched using terms for semaglutide or exenatide, SGLT2 inhibitors, type 2 diabetes, metformin, and adults. Randomized controlled trials were prioritized when the study population and outcomes aligned with the clinical question. Three randomized controlled trials were selected, including a direct semaglutide-versus-canagliflozin comparison, a body-composition substudy of that trial, and a trial comparing exenatide plus dapagliflozin with either agent alone. A supporting systematic review and meta-analysis addressing the same clinical question was also considered.

Results: In the direct head-to-head SUSTAIN 8 trial, once-weekly semaglutide produced greater reductions in HbA1c and body weight than once-daily canagliflozin in adults with T2DM inadequately controlled on metformin. The associated body-composition substudy did not demonstrate a statistically significant between-group difference in total fat-mass reduction. In DURATION-8, combined exenatide and dapagliflozin produced greater HbA1c reduction than either therapy alone, supporting complementary glucose-lowering effects but not providing a pure head-to-head comparison. Overall, the reviewed evidence, including the supporting meta-analysis, favored GLP-1 RAs for HbA1c and weight reduction when compared directly with SGLT2 inhibitors.

Conclusions: For adults with uncontrolled T2DM on metformin in whom improved glycemic control and weight loss are primary goals, GLP-1 RAs appear to provide greater average reductions in HbA1c and body weight than SGLT2 inhibitors. Treatment selection should still account for individual comorbidities and therapeutic priorities, particularly the established cardiovascular and renal benefits of SGLT2 inhibitors. Limitations of this review include the small number of directly comparable randomized trials and heterogeneity in measured outcomes.

Patient Health Care Disparities in Shoulder Instability

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Purpose of Review: Despite the effectiveness and widespread use of surgical stabilization for recurrent shoulder instability, access to treatment and outcomes are not equitable across patient populations. This review examines recent literature on health care disparities in shoulder instability, focusing on how race and ethnicity, sex, socioeconomic status, insurance coverage, geographic access, health literacy, and related social determinants influence care across the preoperative, intraoperative, and postoperative periods.

Recent Findings: Disparities are present throughout the continuum of shoulder instability care. Preoperatively, patients with lower socioeconomic status, Medicaid or other nonprivate insurance, and racial or ethnic minority status may experience reduced access to orthopedic follow-up, delayed imaging and surgery, and more advanced pathology at presentation. Black and other minority patients have been reported to present with greater glenoid bone loss, more Hill-Sachs lesions, or more prior dislocations, while still demonstrating lower surgical utilization in some studies. Intraoperative literature suggests racial differences in operative time, length of stay, and pain management, although evidence specific to shoulder instability remains limited. Postoperatively, socioeconomic deprivation has been associated with missed physical therapy visits, while race, ethnicity, and language proficiency may influence complications, revision patterns, trust, and patient satisfaction.

Summary: Health care disparities in shoulder instability are multifactorial and may accumulate across each stage of care. Current evidence supports important associations between social and demographic factors and access, disease severity, treatment utilization, rehabilitation, and patient experience; however, shoulder-instability-specific evidence remains limited in several areas. Future work should better define these disparities and evaluate targeted interventions, including improved patient education, communication, access to specialty care, and efforts to strengthen diversity and equity within orthopedic practice.

Title: Recognition as a Clinical Virtue: Perceiving Personal Identity in Dementia Care

Author: Luka R Batt
Affiliation: Center for Bioethics and Humanities, The Ohio State University

Abstract:

Neurodegenerative diseases such as Alzheimer's and other forms of dementia progressively erode memoires, cognitive function, communication, social roles and autonomous decision-making. Such capacities represent how of individuals often understand and relate to themselves and others, and their loss therefore presents profound challenges for both medicine and ethics. One such challenge is a problem of perception, as physicians, caregivers and family members often struggle to rightly perceive and respond to the enduring individual before them. My research explores how both contemporary medicine and bioethics can unintentionally exacerbate this problem. Not through malice or neglect, but rather through deeply embedded and habituated patterns of perception around autonomy, independence, functionality, efficiency, and control which subsequently contribute towards vice formation. I argue that these patterns manifest as four distinct temptations towards non-recognition: dependence as failure, fragility as deficiency, control as priority, and autonomy as a measure of identity. Drawing upon an Aristotelian model of virtue ethics, I explore how these temptations manifest as two corresponding vices. Reductionism, the vice of deficiency, occurs when disease, dysfunction, or limitations eclipse the enduring individual. Projectionism, the vice of excess, occurs when clinicians, caregivers, or family members impose their own narratives, desires, or interpretations upon the individual. As the mean between these vices, I propose the virtue of recognition. Which is the cultivated capacity to rightly perceive and respond to the enduring individual through the reality of their personal identity, particularly when conventional markers have become obscured. Recognition holds together both the persistence of personal identity and the profound disruptions caused by disease. In this way, it serves to help reorient clinical attention toward the individual without either reducing them to pathology or romanticizing their condition. Although developed within the paradigm of dementia care, I maintain that recognition represents an essential virtue for medicine more broadly.

Routine Supplemental Oxygen in Acute Myocardial Infarction

Alyssa Benit

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Background: Supplemental oxygen was historically administered routinely to patients with suspected myocardial infarction (MI), regardless of oxygen saturation. However, evidence has questioned whether routine oxygen provides benefit in patients who are not hypoxic. This question is particularly relevant in rural settings, where transport times may be prolonged and healthcare resources are limited. This review evaluates whether routine supplemental oxygen, compared with room air, improves clinical outcomes in adults with acute MI and normal oxygen saturations.

Methods: A focused literature search was conducted primarily using PubMed, with additional searches through ScienceDirect, the New England Journal of Medicine, and AHA Journals. Search terms included acute coronary syndrome, myocardial infarction, prehospital/emergency medical services, supplemental oxygen, oxygen therapy, routine oxygen, and normoxia. Randomized controlled trials directly addressing routine oxygen in non-hypoxic patients with acute MI were selected. Three trials were identified as most relevant: DETO2X-AMI, SOCCER, and AVOID. These trials compared supplemental oxygen with room air in patients with oxygen saturation thresholds of approximately 90%-94% or greater.

Results: Across the three randomized controlled trials, routine supplemental oxygen did not improve outcomes in non-hypoxic patients with an acute MI. The DETO2X-AMI trial, which included 6,629 patients, found no reduction in 1-year all-cause mortality or other major outcomes with routine oxygen. The SOCCER trial found no significant improvement in wall-motion score index or left ventricular ejection fraction with supplemental oxygen. The AVOID trial found that routine high-flow oxygen was associated with increased markers of myocardial injury and larger infarct size at 6 months, without clinical benefit.

Conclusion: Current evidence does not support routine supplemental oxygen for patients with acute MI who are not hypoxic. Oxygen should be reserved for patients with hypoxemia rather than administered solely because MI is suspected. This approach may reduce unnecessary interventions and resource use. Further research is needed to evaluate oxygen strategies in prehospital and rural settings, including low-flow or titrated oxygen for patients with borderline oxygen saturation.

Title: Clinical manifestations and serious adverse effects of subdural block in parturients: a systematic review and meta-analysis.

Author(s): Mia Cassar, Zakaria Ahmed, Carlo Pancaro

Affiliation(s): 1. Michigan State University College of Human Medicine 2. Henry Ford Detroit Department of Anesthesia

Background: Subdural injection is a well-recognized complication of neuraxial anesthesia and analgesia, yet it is frequently poorly recognized at the time of clinical presentation. When it occurs, practitioners are often confronted with a confusing clinical picture in which the behavior of the block does not correspond to the intended neuraxial technique. As a result, the diagnosis is commonly delayed, made only in retrospect, or not established at all.. Accordingly, this systematic review and meta-analysis aims to characterize the clinical manifestations and serious adverse effects associated with suspected subdural block in parturients through a systematic synthesis of the existing literature. This may enable clinicians to better recognize characteristic features of subdural block, facilitating earlier diagnosis and improving patient outcomes.

Methods: A structured systematic review and meta-analysis is to be conducted in accordance with PRISMA guidelines, using multiple databases including MEDLINE, Embase, Cochrane, and Web of Science to identify reports of suspected subdural block during neuraxial Anesthesia. Characteristics of clinical presentation, duration, and adverse outcomes are to be extracted. Findings are to be analyzed to gather further information on both the prevalence and the common clinical symptoms experienced with a subdural block

Results: Of the 44 cases analyzed, progression to a total spinal phenotype occurred in 12 of 44 cases (27%). Respiratory compromise occurred in 16 of 44 cases (36%), hypotension in 26 of 44 (59%), loss of consciousness in 4 of 44 (9%), and cardiac arrest requiring cardiopulmonary resuscitation in 2 of 44 (5%). High cephalad sensory spread represented the most frequent clinical finding, observed in 35 of 44 cases (80%), with the most extensive sensory distribution extending from upper thoracic dermatomes to the trigeminal (V1) nerve. Motor blockade was reported in 30 of 44 cases (68%). Regarding the distribution of motor weakness, isolated lower extremity involvement occurred in 22 patients, isolated upper extremity weakness in 1, and combined upper and lower extremity involvement in 7 patients. Asymmetric sensory distribution was observed in 14 of 44 cases (32%), Horner syndrome in 5 of 44 (11%), and ineffective labor analgesia or inadequate surgical anesthesia necessitated further intervention in 5 of 44 (11%).

Conclusion: In obstetric anesthesia, where neuraxial techniques are ubiquitous, the frequency and severity of serious adverse effects associated with suspected subdural block remain poorly quantified. The results demonstrate clinical findings that may change the clinical criteria of diagnosis going forward.

Autograft Selection for Anterior Cruciate Ligament Reconstruction in Patients Younger Than 20 Years: A Systematic Review and Meta-Analysis of Quadriceps Tendon, Hamstring Tendon, and Bone-Patellar Tendon-Bone

Griffin Gleeson[1], Charles Woodhams[1], Adam Haddad[1], Brian Tani[1], Humza Salim[1], Nicolas Medel[1], Micah Lissy[1]

1. Michigan State University College of Human Medicine

Background: Anterior cruciate ligament (ACL) injury is common in adolescent athletes, and autograft selection is a critical decision in primary reconstruction. Quadriceps tendon (QT), hamstring tendon (HT), and bone–patellar tendon–bone (BPTB) autografts each carry distinct trade-offs, but existing meta-analyses are largely derived from adult populations, and no prior review has pooled direct, within-cohort comparisons among all three grafts in cohorts younger than 20 years. This systematic review and meta-analysis compared graft failure and postoperative strength recovery among QT, HT, and BPTB autografts in patients younger than 20 years, using only head-to-head, within-cohort comparisons.

Methods: PubMed/MEDLINE, Embase, and the Web of Science Core Collection were searched (2006–2026) following PRISMA 2020 guidelines. Eligible studies enrolled patients younger than 20 years undergoing primary ACL reconstruction with a QT, HT, or BPTB autograft, with a minimum 6-month follow-up. To isolate the graft effect from between-study confounding, quantitative synthesis was restricted to studies comparing at least two index grafts within the same cohort. Four outcomes were pooled with a random-effects (DerSimonian–Laird) model, using the Hartung–Knapp–Sidik–Jonkman interval as the primary inference: QT versus HT graft failure, HT versus BPTB graft failure, quadriceps limb symmetry index (LSI), and hamstring LSI. Risk of bias was assessed with ROBINS-I.

Results: Of 2,497 records, 15 studies (published 2014–2026) met inclusion criteria and 10 contributed to the meta-analysis. QT showed a significantly lower graft failure risk than HT (risk ratio [RR], 0.40; 95% CI, 0.19 to 0.86; $I^2 = 0\%$), offset by a lower quadriceps LSI than HT (mean difference [MD], −9.54 percentage points; 95% CI, −14.60 to −4.48; $I^2 = 0\%$). HT carried a higher failure risk than BPTB, although this did not reach significance under the primary interval (RR, 3.22; 95% CI, 0.96 to 10.78; $I^2 = 33\%$). Hamstring LSI did not differ significantly between QT and HT on isokinetic testing (MD, +2.66 percentage points; 95% CI, −4.56 to +9.89).

Conclusion: In patients younger than 20 years, autograft selection reflects a trade-off rather than a fixed hierarchy. QT achieves lower graft failure than HT but at the cost of a short-term quadriceps strength deficit, whereas BPTB offers durable stability tempered by physeal and donor-site concerns. Graft choice should be individualized through shared decision-making that accounts for skeletal maturity and sport-specific demands.

Rafi Haque- Ms 3- MSU CHM Class of 2028

Fariya Haque- University of Michigan Dearborn

Understanding the Bigger Picture of Rural Asthma Inequities

OBJECTIVE: The purpose of this study was to analyze the factors that impact rural asthma patients' access to preventive care and ongoing treatment, as well as to evaluate the effectiveness of provider–patient education programs.

METHODS: This literature review used data from several Michigan counties, categorized by population size and level of infrastructure. Using rurally classified counties, the study focused on specific barriers to care and health outcomes for asthma patients.

RESULTS: Due to barriers in healthcare accessibility, rural asthma patients have a higher mortality rate than urban patients. According to a retrospective cohort study, rural asthma patients had higher rates of emergency visits and prescription use rather than regular checkups and maintenance refills. In contrast, provider education programs for rural patients demonstrated significant improvements: use of spirometry testing increased from 22% to 86%, severity assessment improved from 47% to 88%, and action plan implementation increased from 40% to 86%. In addition, emergency department visits decreased by 10%, hospital admissions by 35%, and oral corticosteroid use by 29%.

CONCLUSION: Previous research has emphasized the importance of provider education programs to improve symptom management and warning sign recognition; however, despite implementation, symptom outcomes did not improve significantly. While provider–patient programs increased awareness and education, major barriers such as transportation and access continued to limit regular checkups, disease management, and medication adherence. Overall, targeted systems-level programs, rather than relying solely on micro-level interventions, are needed to address the root causes of poor health outcomes—namely healthcare limitations and inadequate infrastructure in rural counties—in order to establish a consistent standard of care.

Title: Treatment for High Cholesterol: Statins or Bempedoic Acid?

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Introduction:

It is essential to monitor cholesterol levels as high serum cholesterol levels, also known as hypercholesterolemia, can lead to atherosclerotic cardiovascular diseases such as myocardial infarction, acute coronary syndrome, stroke, and peripheral arterial disease. However, issues arise when administering medications to control high cholesterol as the standard of care is the use of statins, which have non-life threatening but adverse effects on some patients. A clinical dilemma arises whether to prescribe the first-line treatment statin medication knowing that it would cause adverse effects and risk the lack of adherence, or to switch to the less effective second-line treatment of bempedoic acid with no adverse effects.

Methods:

Literature was searched through PubMed with the search: “Bempedoic acid” AND statin AND cholesterol and filtered for randomized controlled trials only.

Results:

The literature revealed that bempedoic acid is effective in lowering LDL cholesterol levels to a similar degree to the reduction seen in statins. Levels of myalgia from bempedoic acid is no different than placebo, and bempedoic acid also lowers cardiovascular risk.

Conclusion:

With evidence showing no difference in the reduction of cholesterol between statin and bempedoic acid, bempedoic acid may offer an effective solution to decreasing cholesterol, especially in patients with adverse statin side effects. This is in contrast to the current paradigm of cholesterol treatment, and a larger study comparing the side effects of statins and bempedoic acid may be investigated as future avenues of research.

Drinking Water Contaminants as Biologically Plausible Drivers of Colorectal Cancer Pathogenesis

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Background: Colorectal cancer (CRC) incidence is rising in selected populations despite expanded screening, suggesting that exposures beyond detection may contribute to disease burden. Drinking water is a continuous, population-wide exposure pathway, but its role in CRC pathogenesis remains underexamined. This review evaluated whether common drinking water contaminants are biologically plausible contributors to CRC and identified mechanisms and research gaps relevant to future causal studies.

Methods: A narrative literature review was conducted using peer-reviewed epidemiologic, experimental, biomarker, metabolomic, and microbiome studies focused on nitrate/nitrite, disinfection byproducts, toxic metals, and microbial pollutants in relation to CRC or CRC-relevant carcinogenic pathways. Evidence was organized by contaminant class, study type, exposure metric, CRC outcome or surrogate endpoint, proposed mechanism, host-susceptibility factor, and limitations in exposure assessment or causal inference.

Results: Nitrate and disinfection byproducts remain the most consistently studied water contaminants in relation to CRC. Nitrate exposure may promote carcinogenesis through endogenous formation of N-nitroso compounds, inducing DNA damage and genomic instability. These effects may be amplified by conditions that enhance nitrosation, including high intake of red or processed meat and reduced antioxidant availability. THMs are increasingly implicated in biologic pathways beyond direct toxicity. Human biomarker and metabolomic studies link THM exposure with inflammatory cytokines, angiogenic mediators, and altered nicotinamide, cytochrome P450, and tyrosine metabolism, suggesting chronic low-dose exposure may affect tumor microenvironment formation, xenobiotic metabolism, and redox regulation.Toxic metals and microbial pollutants broaden the concept of water-related CRC risk. Arsenic and chromium have demonstrated tumor-promoting effects in colitis-associated animal models through reactive oxygen species generation, oxidative DNA injury, impaired antioxidant defenses, and Wnt/β-catenin activation. Waterborne metals may therefore co-promote CRC in inflamed or genetically susceptible colonic tissue. Microbial pollutant and contaminant-driven gut dysbiosis may disrupt epithelial barrier integrity, alter host–microbiome interactions, and sustain chronic mucosal inflammation, promoting progression through the inflammation–dysplasia–carcinoma sequence. Genetic variants, DNA methylation changes in cancer-related genes, inflammatory signatures, and metabolomic profiles may modify biologic response, indicating that waterborne exposures may not act uniformly across populations.

Conclusion: Emerging evidence identifies drinking water contaminants as exploratory but biologically plausible contributors to CRC pathogenesis. Nitrate, THMs, metals, and microbial pollutants may converge on genotoxic stress, oxidative injury, inflammatory signaling, angiogenesis, metabolic reprogramming, epithelial barrier dysfunction, microbiome alteration, and gene–environment interaction. These findings support research using human tissue, biospecimens, organoids, and animal models to define causal mechanisms and identify biomarkers of environmentally mediated colorectal carcinogenesis, while advancing predictive analyses that integrate contaminant exposure, host susceptibility, inflammatory and metabolomic signatures, and gut dysbiosis into comprehensive risk models.

Cooling Strategies Integrated with Endovascular Thrombectomy in Acute Ischemic Stroke: A Systematic Review and Meta-Analysis of Infarct Volume, Functional Recovery, and Safety Outcomes

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Introduction
Endovascular thrombectomy (EVT) reliably restores reperfusion in large-vessel-occlusion acute ischemic stroke, yet a substantial proportion of patients remain disabled despite successful recanalization. Injury accrues both during occlusion, as the penumbra progresses to infarction, and after reperfusion, through ischemia-reperfusion injury, cerebral edema, and infarct expansion. Therapeutic cooling is the most extensively studied neuroprotective adjunct targeting both processes, but the evidence is fragmented across small trials of differing modality, timing, and endpoints, and prior syntheses mixed cooling delivered with and without thrombectomy.

Objective
To determine whether adjunctive cooling in EVT-treated patients reduces infarct volume, improves functional recovery, and is delivered with acceptable safety, stratified by cooling modality.

Methods
We searched PubMed/MEDLINE, Embase, and Web of Science (January 2016 to July 2, 2026) per PRISMA 2020 (PROSPERO CRD420261350550). Randomized trials were appraised with RoB 2 and non-randomized studies with ROBINS-I. Random-effects meta-analysis (REML estimator; Hartung-Knapp intervals for analyses of ≥3 studies) pooled mean differences (MD) for infarct volume and odds ratios (OR) for favorable functional outcome (modified Rankin Scale 0–2 at 90 days) and mortality, with prespecified cooling- modality subgroups, a randomized-trials-only sensitivity analysis, and GRADE certainty rating. Infarct-volume pooling was restricted to the anterior circulation.

Results
Twelve studies comprising 1368 patients (five randomized trials) were included. Selective intra-arterial cooling reduced infarct volume in an exploratory two-study pool (MD −21.3 mL, 95% CI −31.1 to −11.6). Cooling was associated with higher odds of a favorable functional outcome (nine studies; OR 2.15, 95% CI 1.51–3.04; I^2=0%), consistent across selective intra-arterial (OR 1.80, 1.11–2.91) and systemic (OR 2.57, 0.39–16.93) modalities and retained in a randomized-trials-only analysis (OR 1.94, 1.35–2.79). Mortality did not differ (OR 0.70, 0.41–1.18). All non-randomized studies were at serious risk of bias; GRADE certainty was low for functional outcome and very low for infarct volume and mortality.

Conclusion
Adjunctive cooling, particularly selective intra-arterial cooling, was associated with smaller infarcts and better functional outcomes without a clear safety penalty, though the certainty of evidence is low. As selective intra-arterial cooling is delivered within the existing thrombectomy workflow, these findings support advancing adequately powered, standardized randomized trials.

Integrating CT-Derived Optic Nerve Sheath Diameter Metrics with Clinical Scales to Predict Outcomes After Aneurysmal Subarachnoid Hemorrhage

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Introduction
Aneurysmal subarachnoid hemorrhage (aSAH) is a life-threatening neurologic emergency with both primary and secondary intracranial effects. The optic nerve sheath diameter (ONSD) and its ratio to the eyeball transverse diameter (OER), as measured by CT, have been proposed as non-invasive proxies for elevated intracranial pressure in the critical care setting. However, their prognostic significance in aSAH remains uncertain.

Objective
To evaluate whether CT-based OER correlates with long-term functional outcomes in patients with aSAH, as measured by the modified Rankin Scale (mRS).

Methods
We retrospectively reviewed 290 adult patients with aSAH admitted between 2013 and 2024. OER was calculated from axial non-contrast CT head scans obtained at presentation. Patients were dichotomized into favorable (mRS 0–2) and unfavorable (mRS ≥3) outcome groups. We constructed three logistic regression models: (1) a base model using OER alone, (2) a full model incorporating demographic, clinical, imaging, and treatment factors, and (3) an arbitrary model combining OER with established clinical grading scales (WFNS, Hunt-Hess, and modified Fisher). Model performance was evaluated using ROC analysis.

Results
The OER base model alone was not a significant predictor of outcome ($p=0.52$). In the arbitrary model, OER was independently associated with poor outcome ($p=0.03$). The full model identified age, atrial fibrillation, seizures, WFNS grade, pulmonary edema, and shunt placement as significant predictors of poor outcome. Discriminatory performance was highest in the full model (AUC=0.86), followed by the arbitrary model (AUC=0.80), and lowest in the base model (AUC=0.56).

Conclusion
Although OER alone lacks sufficient prognostic power, its integration with established severity scores enhances predictive accuracy for functional outcomes after aSAH. These findings suggest that OER may serve as a useful adjunctive marker in multimodal risk stratification, warranting further validation in prospective studies.

An MRI-Based Craniometric Framework for Teaching Cortical Surface Localization

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Introduction
External anatomical landmark localization of cortical structures has been central to neurosurgical training and craniotomy planning since the nineteenth century. Existing frameworks derive largely from cadaveric specimens, which are subject to fixation-induced tissue shrinkage that distorts native in vivo geometry, while neuronavigation is often unavailable in low-resource settings, remains an adjunct rather than a substitute for anatomic knowledge, and may be degraded by intraoperative brain shift. A practical, reproducible localization tool tested against variable patient anatomy is lacking.

Objective
To establish reproducible MRI-based coordinates for 18 cortical and sulcal structures relative to three palpable cranial references—the coronal suture, external auditory canal (EAC), and zygomatic arch—providing anatomically relevant landmarks for pre-craniotomy localization and minimal-exposure approaches.

Methods
We retrospectively analyzed brain MRI from six adult patients (one hemisphere each, preferentially contralateral to any intracranial pathology), using T1- and T2-weighted sequences. Eighteen cortical and sulcal structures spanning perirolandic, frontal, parietal, temporal, occipital, and deep/opercular regions were each localized as a two-component vector from its assigned reference landmark along the scalp. For every vector component, the mean, standard deviation (SD), and standard error of the mean (SEM) were calculated across the six hemispheres. Given the descriptive nature and sample size, no inferential comparisons were performed.

Results
Across all 54 measured components, no coordinate exceeded an SD of 1.15 cm or an SEM of 0.47 cm, and every mean coordinate fell within the ~2 cm operative centering margin previously reported for craniotomy planning. The most reproducible coordinates were the shared posterior plane of the temporal gyri referenced to the zygomatic arch (SD 0.15 cm), the shared perirolandic mediolateral coordinate referenced to the coronal suture (SD 0.16 cm), and the superior coordinate of the insula referenced to the EAC (SD 0.19 cm). The least reproducible were anteroposterior coordinates measured along the parasagittal convexity—superior parietal gyrus (SD 1.15 cm), intraparietal sulcus (1.12 cm), and postcentral gyrus (1.09 cm). Mediolateral distances from the midline and superior planes referenced to the zygomatic arch were the most predictable from the surface, whereas anteroposterior distance along the convexity carried the greatest variability.

Conclusion
This three-reference MRI framework yields reproducible, surface-based coordinates that localize the majority of measured cortical structures within the accepted craniotomy-centering margin. Precision is highest for mediolateral and zygoma-referenced superior measurements and lowest for long anteroposterior distances along the convexity. Simple, palpation-based, and teachable in both the anatomy laboratory and operating room, the framework offers a practical adjunct for surgical training and pre-craniotomy planning, particularly where neuronavigation is unavailable, and warrants validation in larger cohorts.

Artificial Intelligence in MRI-Based Glioma Imaging: From Radiomics-Based Machine Learning to Deep Learning Approaches

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Introduction

Gliomas are the most common primary malignant brain tumors in adults and are readily detected on conventional MRI, yet substantial challenges persist in accurately delineating tumor extent, grading heterogeneous disease, characterizing molecular features noninvasively, and distinguishing true progression from treatment-related change. Artificial intelligence (AI) has emerged as a means of extracting quantitative imaging information imperceptible to human observers, offering potential to improve precision across the neuro-oncology workflow.

Objective

To synthesize current AI applications for MRI-based glioma detection and segmentation, trace the evolution from radiomics-based classical machine learning toward deep learning capable of end-to-end representation learning, and critically examine the barriers that continue to limit clinical translation.

Methods

A narrative literature search was conducted across PubMed, Scopus, and Google Scholar using combinations of terms including "glioma," "MRI," "machine learning," "deep learning," and "radiomics," prioritizing English-language, peer-reviewed studies published between 2015 and 2025. Studies reporting AI- or ML-based approaches to MRI glioma detection, segmentation, grading, or molecular prediction were included; approximately 34 representative studies were selected, with the process guided by the Scale for the Assessment of Narrative Review Articles (SANRA) to ensure transparency and balanced coverage.

Results

Across curated benchmark datasets, state-of-the-art models achieve Dice coefficients of 0.85–0.91 for whole-tumor segmentation and classification AUC values exceeding 0.90 for glioma grading, with multimodal conventional MRI (T1, post-contrast T1, T2, FLAIR) consistently outperforming single-sequence inputs and deep learning frequently exceeding classical radiomics pipelines when large annotated datasets are available. Tumor segmentation emerged as a foundational enabling task, with U-Net–based architectures dominant and segmentation errors propagating into downstream grading and volumetric assessment. However, most reported performance derived from internal validation: cross-institutional testing produced marked degradation (e.g., Dice reductions of ~0.04–0.17), fewer than 15% of studies incorporated independent external validation, and models were shown to encode latent demographic and acquisition-related signals unrelated to tumor biology. Interpretability remained inconsistently reported, with fewer than 10% of studies applying structured explainability assessment.

Conclusion

AI-based models demonstrate strong technical performance for MRI glioma detection, segmentation, and classification in research settings but are not yet ready for routine clinical use, constrained by dataset bias, protocol heterogeneity, limited external validation, and inadequate interpretability. Current systems are best regarded as decision-support tools rather than autonomous diagnostic solutions, and meaningful adoption will depend on rigorous prospective multi-center validation, harmonization, transparent reporting, and alignment with real-world neuro-oncology workflows.

Functional Restriction in Legally Permissive States: Structural Determinants of Abortion Access and Health System Effects

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Background: Abortion access in the United States is frequently characterized according to statutory permissibility. However, legal status alone may not fully capture functional accessibility, particularly following the Dobbs v. Jackson Women's Health Organization decision in June 2022. Even in states where abortion remains legally protected, structural and systems-level barriers may influence when, where, and how patients obtain care. This review aimed to synthesize and categorize contemporary evidence describing structural and systems-level mechanisms of functional restriction in legally permissive U.S. states.

Methods: We conducted a structured narrative review with systematic search and screening methods examining abortion access in the United States. PubMed was searched on February 11, 2026, using Medical Subject Headings and keywords related to abortion, health services accessibility, and structural barriers. Articles published from January 1, 2015, through February 11, 2026, were eligible. Two independent reviewers screened 505 titles, 286 abstracts, and 48 full texts, with discrepancies resolved through discussion and consensus. Thirty-three studies were included in the primary narrative synthesis. Given heterogeneity in study design, no meta-analysis or formal risk-of-bias assessment was performed.

Results: Evidence was organized into five domains of functional restriction: physician-level constraints; institutional and health system barriers; geographic and economic burden; regulatory and administrative friction; and informational barriers. These mechanisms may interact across the care pathway and contribute to delayed presentation, later gestational age at care, fragmented referral pathways, and redistribution of service demand. Observational and modeling studies further indicate that service redistribution, geographic concentration, and projected capacity strain may shape access even in the absence of formal bans.

Conclusions: Legal permissibility does not ensure functional accessibility. A systems-level understanding of abortion access highlights how layered structural constraints may meaningfully limit timely care despite permissive legal environments. Health system planning and policy evaluation should consider workforce distribution, institutional design, geographic dispersion, administrative requirements, and informational pathways alongside statutory status when assessing access to reproductive healthcare services.

Title: Sex Differences in Paradoxical Vocal Fold Motion: Is Estrogen the Missing Link?

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Abstract:

Background: Paradoxical vocal fold motion (PVFM), also called inducible laryngeal obstruction or vocal cord dysfunction, is a functional laryngeal disorder characterized by inappropriate inspiratory vocal fold adduction and episodic upper airway obstruction. Its presentation often overlaps with asthma, which can delay diagnosis and lead to ineffective treatment. Women account for approximately 70 to 80% of reported cases, yet the basis of this female predominance remains unclear. A 23-year-old collegiate rower with recurrent exertional difficulty getting air in with a sensation of throat closing, no improvement with pre-exercise albuterol, and normal pulmonary function testing was diagnosed with PVFM on flexible laryngoscopy after exercise provocation. The case, together with the marked female predominance of PVFM, raised the possibility that hormonal influences on the larynx may contribute to disease susceptibility.

Methods: A structured PubMed MEDLINE search of literature published from 1980 to the present combined terms for paradoxical vocal fold motion, vocal cord dysfunction, and inducible laryngeal obstruction with terms related to female sex and hormonal exposure, including estrogen, hormonal factors, pregnancy, and contraception. Titles and abstracts were screened for relevance to female patients, sex differences, or hormonal factors in PVFM. The most relevant literature included clinical and observational studies of PVFM as well as physiologic and tissue studies examining hormone responsive properties of the larynx.

Results: Clinical cohorts consistently describe a marked female predominance in PVFM, with reported female to male ratios of approximately 2:1 to 3:1. However, available PVFM studies did not evaluate estrogen levels, pregnancy status, or hormonal medication use as independent variables. Indirect evidence supports a biologically plausible hormonal mechanism. Estrogen and progesterone receptors have been identified in epithelial and glandular structures of normal vocal folds. Physiologic studies in premenopausal women demonstrate changes in vocal fold edema, mucosal pliability, and acoustic characteristics across the menstrual cycle, with lower estrogen phases associated with increased edema and measurable acoustic changes. Postmenopausal vocal fold atrophy and stiffness also appear responsive to hormone therapy. Additional work suggests that sex hormones can influence airway sensory pathways involved in cough reflexes and laryngeal hypersensitivity, mechanisms relevant to reflexive airway closure in PVFM. No studies directly compared PVFM risk or severity across differing estrogen exposures.

Conclusion: The larynx is hormonally responsive, and existing physiologic evidence provides a plausible pathway through which estrogen could influence vocal fold biomechanics and airway sensory sensitivity. Still, the current evidence is indirect and does not establish estrogen as a cause or risk factor for PVFM. Prospective observational studies or retrospective analyses that capture menstrual cycle phase, pregnancy status, hormonal medication use, and symptom severity could help determine whether hormonal factors contribute to the marked female predominance and whether clinically meaningful PVFM subgroups exist.

Antiretroviral Therapy Adherence: Comparing Long-Acting Injectable CABENUVA With Daily Oral Therapy

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Background: Medication non-adherence remains a significant challenge in the management of Human Immunodeficiency Virus (HIV), despite the availability of effective antiretroviral therapy (ART) and programs designed to reduce barriers to treatment. Suboptimal adherence can result in virologic failure, development of drug resistance, and increased risk of HIV transmission. Social stigma, mistrust of the healthcare system, financial concerns, and other social determinants of health may further contribute to difficulty maintaining daily oral medication regimens. Long-acting injectable antiretroviral therapy, including CABENUVA (cabotegravir and rilpivirine), provides an alternative to daily oral therapy and may improve adherence among patients with a history of non-adherence.

Objective: To evaluate whether administration of long-acting injectable CABENUVA every two months is associated with improved medication adherence compared with daily oral antiretroviral therapy among patients with HIV and a documented history of medication non-adherence.

Methods: This study will compare patients with HIV and a history of medication non-adherence who receive CABENUVA every two months with patients who continue daily oral ART. Participants will be followed for 12 months. Medication adherence will be assessed throughout the study period using documented medication administration, prescription refill history, or other available adherence measures. Viral load will also be monitored as a secondary clinical outcome. Additional patient characteristics, including duration of previous oral ART use and baseline viral load, will be collected to evaluate potential differences between treatment groups.

Outcomes: The primary outcome will be medication adherence over the 12-month study period. Secondary outcomes will include changes in HIV viral load and the proportion of patients achieving or maintaining virologic suppression. The study will also examine whether duration of prior oral ART use is associated with adherence or virologic outcomes following transition to CABENUVA.

Conclusion: Long-acting injectable ART may provide an alternative strategy for patients with HIV who experience difficulty adhering to daily oral medication. By reducing the frequency of medication administration from daily dosing to once every two months, CABENUVA may improve adherence and contribute to sustained viral suppression. Evaluating adherence and virologic outcomes in patients with a documented history of non-adherence may help determine whether long-acting injectable therapy should be considered as a strategy for improving HIV treatment outcomes in this population.

GLP-1 Receptor Agonists vs Lifestyle Therapy Alone for Weight Loss in Adults With Obesity Without Diabetes

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Background: Obesity affects approximately 40% of U.S. adults and is associated with type 2 diabetes, cardiovascular disease, and reduced quality of life. First-line therapy is lifestyle modification; however, many patients fail to achieve ≥5% weight loss with lifestyle therapy alone. GLP-1 receptor agonists increase satiety, delay gastric emptying, and promote sustained weight loss. This review examined whether GLP-1 receptor agonists provide greater weight loss than lifestyle therapy alone in adults with obesity without diabetes.

Methods: PubMed Clinical Queries was searched using terms for obesity or overweight and GLP-1 receptor agonists, including semaglutide and liraglutide. Filters included humans, adults, randomized controlled trials, and publication dates from 2015–2024. Titles and abstracts of 143 studies were screened, and three high-quality randomized controlled trials most aligned with the clinical question were selected.

Results: GLP-1 receptor agonists produced greater weight loss compared with lifestyle therapy alone. Semaglutide produced approximately 15% weight loss compared with approximately 2–3% with placebo. Liraglutide also resulted in significantly greater weight loss compared with placebo. Across the studies, ≥5% weight loss was consistently achieved at higher rates with GLP-1 therapy. The most common side effects were gastrointestinal.

Conclusion: GLP-1 receptor agonists produce significantly greater clinically meaningful weight loss compared with lifestyle therapy alone in adults with obesity without diabetes. GLP-1 therapy appears appropriate for adults with obesity who fail lifestyle therapy, but access, affordability, and long-term sustainability remain important considerations. Future studies should evaluate long-term outcomes, effects, and strategies to improve equitable access to treatment.