Ohio State Medical Association - Annual Meeting
April 5, 2025

Medical Student Poster Abstracts

#1

Kristy Helscel, MD, MPH
MS2 - The Ohio State University College of Medicine
Clinical Medicine

A Qualitative Analysis of Surgeon Perspectives on Wearable Biosensors in the Operating Room

Introduction: Wearable biosensors, commonly used in sports to monitor metrics like heart rate variability (HRV), glucose levels, and hydration, are being explored for their potential application in high-stakes environments like the operating room (OR). This study provides a qualitative analysis of surgeons' perspectives on the utility of wearable biosensors, identifying both facilitators and barriers to their adoption.

Methods: Fourteen surgeons and trainees participated in a 14-day study using devices such as the Oura ring, Polar heart rate monitors, and continuous glucose monitors (CGMs). Semi-structured interviews were conducted, and the data were analyzed thematically using NVivo software.

Results: Participants reported that wearables offered valuable physiological insights, prompting behavioral changes, including better hydration and dietary habits. Facilitators of adoption included ease of use, intuitive interfaces, and supportive staff, while barriers encompassed device discomfort, technical issues, and challenges integrating wearables into demanding surgical workflows. Cultural attitudes toward wellness varied, with attendings demonstrating increased acceptance of breaks during surgeries, compared to their training environments, while trainees expressed guilt when stepping away. Participants suggested improvements such as streamlined apps, workflow integration, and embedding wearable data into surgical records.

Conclusion: The study highlights the potential of wearable biosensors to support surgeon well-being and performance while underscoring the need for technological refinements and cultural shifts to address adoption challenges. These findings have implications for optimizing surgical outcomes and fostering a wellness-oriented culture in healthcare.

#2
Neel Agarwal, BS
MS1 – The Ohio State University College of Medicine
Clinical Medicine

A Novel Means to Assess Longitudinal Cholesterol Variability and its Strong Independent Association with Incident MACE Within the NIH "All of Us" Cohort

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Background: Current metrics for long-term cholesterol control, mean lipid counts, fail to account for fluctuations over time. One methodology to assess for longitudinal control is time in target range (TTR) analysis, which quantifies the percentage of time a patient's lab value is in a target range.

Purpose: The present analysis determined the relationship between measured lipid panel TTR with incident MACE as compared to taking the mean attained lipids among a heterogenous cardiovascular-risk cohort. Methods: "All of Us" is an 849,000-participant prospective cohort that aims to represent the diversity of the US by aggregating participant demographics, medications, adverse events, and laboratory and clinical measurements. A participant's HDL-C was in target range between 40–80 mg/dL for men and 50–80 mg/dL for women, LDL-C between 0-100 mg/dL, triglycerides between 0-150 mg/dL, and total cholesterol between 0-200 mg/dL. Participant's TTR was calculated via traditional and Rosendaal linear interpolation (RLI) methods and grouped into percentage TTR: <25%, 25-50%, 50-75%, >75%. Descriptive statistics, hazard ratios, and survival curves were generated to assess the contribution of remnant cholesterol to MACE (defined as the first occurrence of myocardial infarction, stroke, or death.)

Results: 97,683 participants were included for analysis and 20,499 (21.0%) had diagnosed hypercholesteremia, total cholesterol of 179.1±41.5 mg/dL, LDL-C of 100.4±35.3 mg/dL, and triglycerides of 121.3±68.3 mg/dL. In multivariable hazards analysis adjusted for demographics, medical history, medications, and last visit lipids, per 10 mg/dL, mean LDL-C (HR: 0.96, 95% CI (0.94,0.98), $p<0.001$) and mean total cholesterol (HR: 0.96, 95% CI (0.94,0.97), $p<0.001$) were significantly associated with decreased MACE risk, but not mean triglycerides. However, using RLI, >75% compared to <25% TTR, LDL-C (HR: 0.78, 95% CI (0.70,0.88), $p<0.001$), total cholesterol (HR: 0.58, 95% CI (0.52,0.65), $p<0.001$), and triglycerides (HR: 0.66, 95% CI (0.59,0.74), $p<0.001$) were significantly associated with decreased MACE risk, corroborated by survival curve analysis. Mean lipids and traditional TTR demonstrated similar trends, but RLI was more significant with larger decreases in incident MACE risk.

Conclusion: LDL-C, triglyceride, and total cholesterol RLI had an advantage in prediction of incident MACE among NIH "All of Us" Cohort over mean lipids or traditional lipid TTR.

#3
Marina Abdelshahid and Martina Abdelshahid
MS1 – The Ohio State University College of Medicine
Clinical Medicine

Minimal handgrip force is needed for transcutaneous electrical stimulation to improve hand functions of patients with severe spinal cord injury

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Co-author/presenter: Martina Abdelshahid, MS1 at The Ohio State University College of Medicine Location of research: University of California, Los Angeles

Purpose Neuromodulation with electrical stimulation is a powerful intervention to facilitate rehabilitation of patients with spinal cord injury (SCI). To determine whether training combined with transcutaneous electrical spinal cord stimulation (tSCS), with or without systemic serotonergic treatment with buspirone (busp), could enhance the restoration of motor function in individuals with severe hand paralysis following SCI, we conducted this project.

Methods We assessed ten subjects in a double-blind, sham-controlled, crossover study. The study consisted of six phases. In phase 1, subjects received 20 weeks of hand grip physical therapy alone to ensure maximal benefits from physical therapy had been obtained before any further treatments. The next four phases of the study were: a placebo + sham tSCS (phase 2), buspirone or tSCS (phase 3), whichever treatment, buspirone or tSCS, that had not previously been used (phase 4), and tSCS + buspirone (phase 5). The order of phases 3 and 4 was randomized for each subject. The last phase (phase 6) consisted of a 5-month washout period in which no treatment was given to the subjects.

Results All treatments—busp, tSCS, and the busp plus tSCS—reduced muscle tone and spasm frequency. Buspirone had no discernible impact on grip force or manual dexterity when administered alone or with tSCS. In contrast, grip force, sinusoidal force generation, and grip-release rate improved significantly after 6 weeks of tSCS in 5 out of 10 subjects who had residual grip force within the range of 0.1–1.5 N at the baseline evaluation. Improved hand function was sustained in subjects with residual grip force 2–5 months after the tSCS and buspirone treatment.

Conclusions We conclude that tSCS combined with training improves hand strength and manual dexterity in subjects with SCI who have residual grip strength greater than 0.1 N. Buspirone did not significantly improve the hand function nor add to the effect of stimulation.

#4
Jon Bernard
MS2 – University of Cincinnati College of Medicine
Advocacy, Policy, or Public Health

Engaging Rural Community Gatekeepers in CALM Suicide Prevention Training

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Purpose: Adams County (AC), Ohio is a Health Resources and Services Administration (HRSA)-designated rural area in Appalachian Ohio with a shortage of mental health professionals. Adolescents with mental health concerns in AC are less likely to receive mental health care, putting them at increased risk of untreated suicidal ideation (SI). Knowing that gun ownership rates are higher in rural areas, and firearms are the most lethal method of suicide, an effective suicide prevention method for rural areas is crucial. This study evaluates the effectiveness of the Counseling on Access to Lethal Means (CALM) training when administered to rural community gatekeepers (e.g., school-based counselors, resource officers) in AC.

Methods: The CALM training was provided to community gatekeepers who interact with youth at risk for SI. CALM training helps recognize when lethal means reduction is necessary in adolescents with SI. Training was approximately three hours and included lecture-based instruction, as well as case studies and role-playing activities. All participants (N = 31) completed pre- and post-surveys, which measured attitudes, knowledge, and behavior surrounding suicide prevention. Assessments included the Gatekeeper Behavior Scale (GBS), the Knowledge and Attitudes of Firearm Assessment and Safety Counseling (KAFASC) survey, and the Knowledge of Suicide Assessment (KSA) survey.

Results: Results showed increased knowledge and behaviors surrounding suicide prevention. There was a significant difference between pre- (M=39.52, SD=8.29) and post- (M=49.52, SD=10.27) scores on the KSA survey, $t(24) = -4.20$, $p < 0.001$. A significant difference was also present between pre- (M=37.85, SD=4.47) and post- (M=42.74, SD=4.99) scores on the GBS, $t(26) = -3.92$, $p < 0.001$. The KAFASC survey showed no significant difference between pre- (M=44.87, SD=11.57) and post- (M=43.96, SD=12.83) scores, $t(22) = 0.27$, $p = 0.79$.

Conclusions: This study suggests that CALM training can be an effective suicide prevention method when utilized by community gatekeepers. Especially in rural areas with high rates of firearm ownership and limited access to mental health providers, innovative suicide prevention methods are imperative. Trained community gatekeepers that interact with adolescents at risk for SI can help decrease suicide rates in rural areas and address this growing public health crisis.

#5
Tate Barney
MS2 – Wright State Boonshoft School of Medicine
Advocacy, Policy, or Public Health

Assessing Socioeconomic Patterns of Excessive Alcohol Consumption in Ohio: A County-Level Analysis

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Abstract:

Background: Excessive alcohol consumption poses significant public health challenges, with complex socioeconomic factors influencing drinking behaviors. Understanding the relationship between socioeconomic determinants and excessive drinking patterns at the state and county levels is crucial for informing targeted interventions.

Objective: To investigate the associations between excessive drinking (binge or heavy drinking) and socioeconomic factors, including median household income, mental health provider availability, health insurance coverage, educational attainment, and unemployment rates across counties in Ohio.

Methods: We analyzed data from the 2023 County Health Rankings for 88 counties in Ohio. Spearman correlations were used to assess associations between excessive drinking and socioeconomic variables. Paired t-tests examined changes in excessive drinking from 2016 to 2022. Linear regression determined predictors of excessive drinking in 2022.

Results: Excessive drinking showed a moderate positive correlation with median household income ($\rho=0.435$, $p<0.001$) and high school completion ($\rho=0.407$, $p<0.001$), and a moderate negative correlation with being uninsured ($\rho=-0.403$, $p<0.001$) and unemployment rates ($\rho=-0.371$, $p<0.001$). No significant association with mental health provider availability. Excessive drinking increased from 17.4% in 2016 to 19.0% in 2022 ($p<0.001$). Unemployment was the strongest predictor in the regression model.

Conclusion: This study shows the complicated connections between different socioeconomic factors and how common binge drinking is in Ohio. As alcohol misuse problems keep increasing, it will be crucial to understand and deal with these socioeconomic contexts through multi-faceted approaches to tackle hazardous drinking habits and their impacts on public health. Continued research efforts, coupled with evidence-based policies and community-driven initiatives, will be vital in mitigating the burden of excessive drinking and promoting overall well-being across all segments of Ohio's population.

#6

Alexis Baumeyer
MS3 – University of Cincinnati College of Medicine
Other

Precious Solutions: Using Data to Augment IV Fluid Conservation Strategies.

Authors: Marcus Lehman, MD, MBA(1); Alexis Baumeyer, MS3(2); Keiko Smith(3); Sean Josephs, MD, FCCM(1) (1)University of Cincinnati (UC) Department of Anesthesiology; (2)UC College of Medicine; (3)UC Health Data & Analytics

Purpose In response to IV fluid shortages caused by Hurricane Helene's disruption of Baxter's production facility in Marion, North Carolina—a key supplier for the United States—our team initiated a conservation strategy to optimize fluid usage while maintaining clinical efficacy and safety.

Methods Recognizing the need for immediate adaptation, we employed a data-driven approach that accounted for patient needs and provider habits. First, we targeted a procedural area with shorter, more predictable cases to enable a rapid, measurable intervention. A six-month procedural data analysis revealed that most procedures required significantly less fluid than the standard 1L IV bags in use. To reduce unnecessary waste, we proposed replacing the initial 1L IV bag with a 500mL bag and allowing additional 250mL increments as needed. Implementation of this protocol resulted in an average IV fluid savings of 400mL per patient—translating to nearly 400L per month within our system.

Results This streamlined, data-driven intervention quickly identified hidden waste and established a sustainable conservation framework. By tracking implementation through run charts, we ensured ongoing monitoring while preserving clinical decision-making and patient volume. Beyond addressing an immediate resource strain, this approach offers a scalable model for broader hospital-wide adoption.

Discussion This initiative highlights a practical, rapidly deployable response to climate-driven supply chain disruptions while fostering long-term environmental responsibility and resource efficiency in clinical practice. Future directions include cost analysis for sustained financial impact and strategic identification of procedural areas where 1L bags provide the greatest value, optimizing conservation efforts across the health system.

#7
Gabriel Lee
MS2 – The Ohio State University College of Medicine
Advocacy, Policy, or Public Health

Analysis of Asymptomatic and Symptomatic Sexually Transmitted Infections and the Impact on Clinical Outcomes in a Student-Run Free Clinic

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Purpose: Over one million curable STIs are acquired daily among individuals aged 15–49, most of whom are asymptomatic. Patients with lower socioeconomic status (SES) are disproportionately affected and less likely to access STI care, emphasizing the critical role of free clinics. While literature highlights the importance of asymptomatic testing, little focuses on uninsured patients. This study aimed to evaluate symptomatic and asymptomatic STI testing outcomes at a student-run free clinic in a large Midwestern medical school. We hypothesized that symptomatic tests would yield higher positive rates than asymptomatic tests.

Methods: This was an IRB-approved retrospective review of 296 patient records from October 2019 to November 2023. Demographics, symptoms, collection sites, and results were assessed. Symptomatic versus asymptomatic status was determined retrospectively. Pearson's Chi-Square, Fisher Exact, and Kruskal-Wallis tests were used for intergroup analyses, with a 2-sample test for equality of proportions examining positivity and negativity differences. Statistical significance was set at $p < 0.05$.

Results: Gonorrhea and Chlamydia were the most common tests (197), followed by Human-Immunodeficiency Virus (HIV) (185), Syphilis (173), Trichomonas (86), Candida (80), Gardnerella (80), and HPV (46). The most common demographics tested were patients identifying as female and Black/African American. There was no statistical difference between asymptomatic and symptomatic testing on both positive and negative testing rates for any STI (Table 1).

Conclusion: In this study, we observed no difference in positivity or negativity rates of STI tests between asymptomatic and symptomatic patients. Given the sequelae of untreated STIs and the limited contact that uninsured or underinsured patients may have with the healthcare system, availability of free STI testing for patients with and without STI symptoms is essential to reduce the rates of STIs, especially amongst underinsured and uninsured patient populations.

#8
Kennedy Couch
MS1 – University of Toledo College of Medicine and Life Sciences
Basic Science / Translational Research

Preserving Limbs and Lives: The Transformative Role of Cellular, Acellular, and Matrix-like Products (CAMPs) in Diabetic Foot Ulcer Care Using TriNetX Data

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Background: The burden of diabetic foot ulcers (DFUs) on patients and healthcare systems is substantial, with complications often leading to amputation and significant morbidity. Despite advancements in DFU management, optimizing treatment to reduce these adverse outcomes remains a priority. This study aimed to compare the effectiveness of cellular, acellular, and matrix-like products (CAMPs) versus standard care (debridement alone) in lowering the risk of lower-extremity amputation and improving survival outcomes in patients with DFUs.

Methods: A retrospective cohort study was conducted using the TriNetX database. Patients with type 1 or type 2 diabetes and foot ulcers were included. Patients were stratified into two cohorts: those receiving debridement alone and those treated with CAMPs in addition to debridement. A sub-analysis examines the effect of early (<1 month) versus delayed (>1 month) CAMP initiation after DFU diagnosis. Propensity score matching balanced baseline characteristics between cohorts. The primary outcome was the risk of lower limb amputation (LLA) within five years, analyzed using cohort-level statistics, Kaplan-Meier survival analysis, and log-rank tests.

Results: Before propensity score matching, the CAMPs cohort (n=7,612) had better glycemic control and higher rates of comorbidities compared to the debridement-only cohort (n=82,146). After matching, cohorts were well-balanced (n=7,012 each). The risk of LLA was significantly lower in the CAMPs cohort compared to debridement only (19.50% vs. 22.10%, p=0.0005). Kaplan-Meier analysis demonstrated improved 5-year amputation-free survival in the CAMPs cohort (70.98% vs. 69.01%, p=0.0004). Early CAMP initiation further reduced LLA risk compared to delayed initiation (15.59% vs. 19.23%, p=0.1279).

Conclusion: CAMP therapy significantly reduces the risk of LLA and improves survival rates in patients with DFUs. Early initiation further enhances these benefits, highlighting the importance of timely diagnosis and treatment. These findings underscore the potential of CAMPs as a critical component of advanced DFU care, warranting broader clinical adoption and further investigation.

#9
Cathy Charles
MS4 – Case Western Reserve University
Advocacy, Policy, or Public Health

Stakeholder Perspectives on Design Requirements for a Technology-Enhanced Community Health Worker Intervention to Support Black Youth with Type 1 Diabetes

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Introduction/Purpose: Technology adoption in Type 1 Diabetes (T1D) management remains disproportionately low among Black youth, despite known benefits. Community health workers (CHWs) have shown promise in addressing health disparities, but their potential role in supporting diabetes technology adoption is unexplored. An intervention was developed combining CHWs with remote glucose monitoring tools, including a patient-facing mobile app and clinician dashboard, to address this gap. Understanding stakeholder preferences is crucial for addressing technology adoption disparities.

Methods: We conducted qualitative interviews with key stakeholders in Northeast Ohio: Black young adults living with T1D (n=7), parents of Black youth with T1D (n=10), and diabetes care providers (n=11). Analysis focused on identifying essential features for the proposed intervention combining CHWs with digital glucose monitoring tools.

Results: Three key design priorities emerged from stakeholder feedback: 1) CHWs should combine personal experience with T1D and shared lived experiences with the families they serve; 2) Digital tools must prioritize positive reinforcement through culturally-resonant messaging; and 3) The intervention should offer flexible implementation options for engagement. Stakeholder preferences varied with young adults prioritizing peer support, and parents focusing on problem-solving capabilities and resource access. Healthcare providers valued dashboard filtering, workflow tools, and managing shared patients. All groups emphasized the importance of customizable security features and shared communication channels between youth and caregivers.

Conclusions: Successfully supporting Black youth with T1D through technology-enhanced interventions requires attention to cultural alignment, messaging approach, and implementation flexibility. These findings provide a framework for developing inclusive digital health support systems.

#10
Katie Chong
MS2 – Northeast Ohio Medical University
Clinical Medicine

Novel Approach to Lifelong Single Ventricle Interdisciplinary Care Using a Telehealth Clinic Model

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Co-authors: Kristen Stefanski, MD, Kathryn Wheller, MSN, APRN-CNP, Miraides F. Brown, PhD, MS, PStat Institution: Akron Children's Hospital, Akron, OH

Introduction: The increasing longevity of patients with single ventricle heart disease (SVHD) necessitates ongoing monitoring given the high risk for multisystem comorbidities. Interdisciplinary clinics are essential to this longitudinal monitoring, though most traditional clinic settings are limited to a single stage of repair. This study evaluates the feasibility and effectiveness of a novel interdisciplinary Lifelong Interventions Focused on Thriving (LIFT) clinic that follows SVHD patients through all stages of repair using a telehealth model.

Methods: This retrospective chart review included patients aged 0-26 years with SVHD who completed a LIFT clinic visit between 1/1/21-12/31/22. The SPROUT Telehealth Evaluation and Measurement (STEM) profile was used to identify outcome measures in individual experience, health delivery, health outcomes, and key performance indicators. These parameters were evaluated using descriptive statistics. Pre- and post-clinic adherence to the SV testing pathway was analyzed using McNemar's test.

Results: 64/111 (57.7%) eligible patients completed LIFT visits. Those with completed visits ranged in age from <1-22 years with a mean age of 9.2 years; barriers to telehealth were identified for 16 (25%) patients. Adherence to the SV testing pathway improved following LIFT visits, with statistically significant increases in orders for echo (p=0.0016), labs (p<.0001), Holter (p<.0001), liver elastography (p=0.025) and cardiopulmonary exercise stress test (p=0.0005). Testing per pathway led to 4 (12.5%) new arrhythmia diagnoses and 15 (65.2%) vitamin D insufficiency diagnoses. During LIFT clinic, 10 (41.7) patients screened at-risk for depression on the PHQ-9. After LIFT clinic, 32 (50%) patients completed evaluations with neuropsychology which led to new diagnoses in 25 (78.1%) patients. Overall adaptive skills were at least one standard deviation below the mean in 10 (52.6%) patients.

Conclusions: Patients seen in LIFT Clinic were more adherent with the recommended single ventricle testing pathway, leading to improved monitoring and increased identification of new diagnoses. The LIFT Clinic interdisciplinary telehealth model appears to be an effective means of providing higher quality, longitudinal care for this at-risk population. More research is needed on acceptability, equitable access, and long-term outcomes.

#11
Shivani Patel
MS2 – Northeast Ohio Medical University
Clinical Medicine

The Effect of Varying Psychological Chief Complaints in Pharmacological and Physical Restraint Utilization in the Emergency Department

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[4.07 (3.55 - 4.67)]

Background No prior study has evaluated the association between psychiatric complaints and the use of pharmacological sedation and physical restraints in the emergency department (ED). This knowledge promotes evidence-based practices and aims to reduce unnecessary restraint use and improve care. The goal of this study was to evaluate the impact of a patient's psychiatric complaint on the use of pharmacological sedation and physical restraints.

Methods This was retrospective review of adult ED encounters within a large integrated healthcare system (19 EDs) between January 1, 2019, and December 31, 2022, with a primary psychiatric complaint. Data was extracted from the electronic medical record and included demographics, ED throughput and disposition, toxicology results, and sedation and restraint use. Categorical variables are presented as frequencies and percentages and compared using Chi-square tests or Fisher's exact tests. Multiple logistic regression was used to assess the effect of psychiatric complaint on sedation and restraint use while controlling for confounders.

Results The top presentations among all patients (n=29,306) were suicidal ideation (SI, 49%) and anxiety (30%). Pharmacological sedation was utilized for 19% (n=5667) of patients. Patients presenting with anxiety were more likely to be sedated than those presenting with depression [4.07 (3.55 - 4.67)], hallucinations [AOR: 2.25 (CI:1.98 - 2.56)], SI [AOR: 3.66 (3.30 - 4.06)], homicidal ideation (HI) [AOR: 1.79 (CI:1.40 - 2.29)], or medical clearance [AOR: 4.41 (CI:3.49 - 5.57)]. Restraints were utilized for 2% (n=471) of patients. There was no association between complaint and duration of restraint use. Restraints were utilized most frequently for patients presenting with SI, (63%) and hallucinations (15%). Patients presenting with anxiety are less likely to be restrained than patients with SI [AOR: 0.43 (CI:0.28 - 0.65)], HI [AOR: 0.14 (CI:0.08 - 0.25)], medical clearance [AOR: 0.21 (CI:0.12 - 0.37)], or hallucinations [AOR: 0.21 (CI:0.14 - 0.33)].

Conclusion Patients who present for anxiety are more likely to have pharmacological sedation than other complaints. The use of restraints is more likely in patients with SI, HI, hallucinations, and medical clearance complaints. The next steps are evaluating the use of a behavioral assessment of agitation risk factors to allow for early administration of oral medications to avoid the use sedation and restraints.

#12
Umida Burkhanova
MS2 – NEOMED
Clinical Medicine

Impact of the COVID-19 Pandemic on the Incidence and Presentation of Idiopathic Central Precocious Puberty

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AUTHORS: Umida Burkhanova, Barbara Garza-Ornelas MD, Krithika Sundaram, MD, Katherine Kutney MD

INTRODUCTION: Central precocious puberty (CPP) is the early activation of the hypothalamic-pituitary-gonadal axis, causing early pubertal changes. The COVID-19 pandemic disrupted routines, physical activity, and increased psychosocial stress, which may impact pubertal onset. Few studies have explored trends in idiopathic CPP across pandemic phases. This study examines the incidence and presentation of CPP during pre-pandemic, pandemic, and endemic periods.

METHODS: Patients diagnosed with idiopathic CPP at Rainbow Babies and Children's Hospital were identified using ICD-10 codes E.30.1 or E22.8. Data were collected from pre-pandemic (7/1/2018–12/31/2019), pandemic (7/1/2020–12/31/2021), and endemic (7/1/2022–12/31/2023) periods. Manual chart reviews were conducted in EMR. Cases of peripheral puberty or space-occupying brain lesions were excluded. Fisher's exact test compared categorical variables, and Kruskal-Wallis or Mann-Whitney tests compared continuous variables.

RESULTS: Idiopathic CPP cases increased from 19 pre-pandemic to 35 during the pandemic, then decreased to 21 in the endemic period, with total new patient volumes remaining stable ($p=0.06$). A significant increase occurred between pre-pandemic and pandemic periods ($p=0.03$). The median diagnosis age was younger during the pandemic (7.7 years, range 5.8–9.2) than in the endemic period (8.5 years, range 4.4–11, $p=0.006$), but was similar to the pre-pandemic period (8 years, 5.9–9.1). BMI percentiles showed no significant variation. Most cases (71/75) were female. Breast enlargement (100%) and growth acceleration (46%) were common symptoms, while menarche (11%) was less frequent. Adrenarche occurred in 83% of girls, with no variation across periods. Diagnostic methods remained consistent. Racial and ethnic subgroup analysis was conducted, showing that Black, White, and Other racial groups had varying case distributions: pre-pandemic (Black: 6, White: 11, Other: 2), pandemic (Black: 18, White: 15, Other: 2), and endemic (Black: 11, White: 6, Other: 4). Hispanic patients comprised 2 pre-pandemic cases, 0 pandemic cases, and 2 endemic cases, while non-Hispanic patients comprised the majority. Fisher's exact test found no significant differences ($p>0.05$).

CONCLUSIONS: Idiopathic CPP cases significantly increased during the COVID-19 pandemic, suggesting pandemic-related factors may influence pubertal timing. Further research is needed to explore the environmental, psychosocial, and biological contributors. This study highlights the importance of monitoring pubertal health during societal disruptions.

#13
Isaac Arefi
MS3 – University of Toledo College of Medicine
Clinical Surgical

Impact of External Fixation Duration on Infection Rates in Trimalleolar Ankle Fractures

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Introduction Surgical site infections (SSIs) are significant complications following orthopedic procedures, particularly in foot and ankle surgeries. Trimalleolar ankle fractures often require external fixation before open reduction and internal fixation (ORIF) to allow for soft tissue recovery. This study examines the relationship between external fixation duration and postoperative infection rates.

Methods A retrospective analysis was conducted on 147 trimalleolar ankle fractures treated operatively at ProMedica Orthopaedic Trauma Service (Toledo, Ohio) from 2017 to 2022. Of these, 52 patients underwent external fixation before ORIF. Patients were categorized into three groups based on fixation duration: 0–20 days (Group A), 21–30 days (Group B), and >30 days (Group C). Superficial and deep SSIs, need for debridement, and unexpected surgeries were analyzed using linear regression.

Results Superficial infection rates increased with fixation duration: 9.5% (Group A), 12.5% (Group B), and 26.7% (Group C) (R^2 = 0.88). Similarly, debridement rates were 9.5%, 25%, and 40%, respectively. However, deep infection rates declined with increased fixation duration: 9.5% (Group A), 6.5% (Group B), and 6.6% (Group C). This inverse trend may be due to prophylactic antibiotic use and early intervention for superficial infections.

Conclusion Prolonged external fixation is associated with higher superficial infection and debridement rates. However, deep infection rates were lower with longer fixation, likely due to antibiotic protocols. A fixation duration of three to four weeks may optimize stabilization while minimizing infection risks. A more in depth look at the relationship between the duration of time in ex-fix and the rate of infection would be beneficial in determining the ideal surgical management of these fractures.

#14
Selena Yao
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Clinical Surgical

Advancing Renal Mass Treatment: Evaluating a Combined Biopsy and Microwave Ablation Approach

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Introduction: New guidelines support image-guided ablation (ie: microwave ablation (MWA)), to treat select renal masses, advising biopsy (Bx) either separately before or at time of ablation. This study compares procedures and clinical outcomes of MWA-alone versus single-setting Bx+MWA for T1a/b renal masses.

Methods: A single-institution retrospective review (2016-2023) included 76 renal masses treated with MWA-alone (n=52) or Bx+MWA (n=24) using a gas-cooled 2.45GHz MWA system (65W, 5-15 min) and 17g antenna. Post-operative assessments included immediate post-MWA CT, ~2-hour observation, 1-week call, 2-month CT/MRI+IR visit, and q6-month imaging. Statistical tests included Mann-Whitney U and Chi-square. Institutional Bx-alone group (n=11) lacked statistical power for comparison.

Results: No differences were found between groups in age (71.6±8.6 vs. 68±8.2 years; p=0.154), comorbidity (CCI) scores (5.7±1.5 vs. 6.4±2.2; p=0.162), ablation energy (34.2±11.6kJ vs. 33.4±11.3kJ; p=0.75), recovery analgesia use (4.2% vs. 12%; p=0.30), follow-up duration (2.7 vs. 3.3 years; p=0.14), or adverse events (4.2% vs. 2.0%; p=0.57). One mild adverse event occurred per group: subcapsular hematoma (MWA-alone) and contained urinoma (Bx+MWA). Bx+MWA masses were larger (3.34±0.74 cm vs. 2.7±0.79 cm; p=0.002) and more complex (P-RAC 8.9±2.6 vs. 6.5±2.3; p<0.001). Bx+MWA required more fentanyl (198±100 mcg vs. 146±60 mcg; p=0.01), midazolam (3.6±1.4mg vs. 2.8±1.3mg; p=0.004), and procedure time (64±41 vs. 46±30 minutes; p=0.034). Non-diagnostic biopsies (8.3%) occurred less than reported historical core biopsies (13.9%). LTR rates at 1, 2, and 3 years were 0%, 4.2%, and 4.2% for Bx+MWA, and 0%, 1.9%, and 1.9% for MWA-alone (p=0.182). Historically, Bx-alone carries risk of hematoma (4.9%), hemorrhage, and tumor seeding (5.7%).

Conclusions: Compared to MWA-alone, concurrent Bx+MWA modestly increases procedural parameters but does not alter clinical outcomes. MWA's thermal effect may mitigate biopsy-related risks.

#15
Emily Arellano
MS3 – Northeast Ohio Medical University (NEOMED)
Clinical Medicine

Evaluating Bone Mineral Density and Osteoporosis Prevalence in Postmenopausal Hispanic Women: An Updated Review

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Purpose: Postmenopausal women face a higher risk of osteoporosis due to a decline in ovarian estrogen, which leads to reduced bone mineral density (BMD) and greater susceptibility to fragility fractures. Older studies suggest that Hispanic women (HW) have a higher BMD on average than non-Hispanic White (NHW) women and are at less risk for these fractures. The purpose of this review is to summarize recent studies on BMD in postmenopausal HW in the United States and to promote bone health education and osteoporosis prevention in this understudied population.

Methods: PubMed, Medline, and CINAHL searches were conducted. Inclusion criteria for articles were peer-reviewed, published within the last 20 years, evaluated HW at least 40 years-old in the United States, and measured BMD using dual x-ray absorptiometry (DXA).

Results: 13 articles were included in this review. There were minimal differences in total body BMD between HW and NHW women, with some evidence of greater prevalence of osteoporosis and osteopenia among HW than NHW women. Some proposed risk factors included non-U.S. citizen status, unemployment, low income, and less than high school education. Bone health in Hispanic populations involves a multifaceted interplay between various factors, including genetics, hormones, socioeconomic conditions, and lifestyle behaviors, many of which are not fully understood. While some studies focused on specific Hispanic groups, such as Mexican Americans and Puerto Ricans, there is a broader category of “Hispanics” as defined by the U.S. Census Bureau with notable cultural differences that also play a role.

Conclusion: There is a gap in the literature regarding BMD and risk factors for osteoporosis in postmenopausal HW. HW have similar, or in some cases, lower BMD than NHW women in contrast to what older literature may suggest. Future studies that include HW and stratify by cultural subgroups are needed to better assess BMD and risk factors for osteoporosis in this population to prevent a substantial increase in morbidity and mortality associated with osteoporotic fractures in the U.S. Hispanic community.

#16
Sarah Lux
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Clinical Surgical

A Comprehensive Review of Plastic Surgery's Role in Managing Xeroderma Pigmentosum

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Background: Xeroderma Pigmentosum (XP) is a rare, autosomal recessive disease that results in increased risk of skin blistering and cutaneous malignancies. XP is associated with significant morbidity and mortality, making dermatologic and surgical intervention crucial. Despite literature on the varied treatment routes for XP, studies have yet to focus on the role of plastic and reconstructive surgery. This study aimed to review the published literature on XP to assess the role of plastic and reconstructive surgery in the management of this condition.

Methods: A literature review was conducted using the PubMed database. Keywords such as "xeroderma pigmentosum," "plastic and reconstructive surgery," and "microsurgery" were included. Only studies published in English were included. Animal studies, basic science articles, and systematic reviews were excluded. Data extraction was conducted to assess patterns and trends in the existing literature.

Results: This review highlights a variety of procedures performed to manage XP. Extracted articles published between 1969 and 2023 were included. There were a total of 66 patients across all studies, with the average age being 19. The most commonly treated area was the face, specifically the nasal region, followed by the hands. Out of all studies that mentioned flaps, among the top three used were forehead flaps, rectus abdominis myocutaneous flaps, and radial forearm flaps. Skin grafts and flaps were utilized for reconstructive, prophylactic, and curative purposes. The most commonly mentioned benefits were prevention of tumor recurrence, satisfactory functionality, and alleviated pain. Procedural complications highlight the importance of follow-up visits to assess for recurrence of malignancy and improper wound healing.

Conclusions: Plastic surgery has played a notable role in the prophylaxis of new lesions, the reconstruction of existing deficits, and the curing of cutaneous malignancies. The variety of procedural options, such as grafts and flaps, allows for aesthetic and practical patient outcomes. In addition to the previously mentioned benefits, several studies reported tumor recurrence after reconstruction. These findings highlight the critical role of plastic and reconstructive surgery in managing XP and underscore the need for ongoing research to optimize surgical techniques and improve patient quality of life.

#17

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Increased risk of nonmelanoma skin cancer with ustekinumab, but not with interleukin (IL)-17 or IL-23 inhibitors: An international analysis of systemic psoriasis treatment

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Purpose: Psoriasis is a chronic inflammatory skin disease that is associated with increased skin cancer risk. Systemic agents such as cyclosporine, methotrexate, and tumor necrosis factor (TNF)-α inhibitors further elevate the risk of nonmelanoma skin cancer (NMSC). The cutaneous malignancy risk associated with newer biologics, such as interleukin (IL)-12/23 inhibitors, IL-17 inhibitors, and IL-23 inhibitors, remains unclear. This study evaluates the skin cancer risk of systemic psoriasis therapies using a large, international database.

Methods: This retrospective cohort study used the TriNetX Research Network (containing over 750,000 psoriasis patients at 103 institutions worldwide) to identify psoriasis patients treated for ≥2 or ≥5 years with a systemic therapy (TNF-α, IL-17, IL-23 inhibitors, IL-12/23 inhibitors [ustekinumab], cyclosporine, methotrexate, or apremilast). Outcomes were incident NMSC or melanoma during treatment. Patients with a history of NMSC, melanoma, actinic keratosis, phototherapy, organ transplant, radiation exposure, or who received more than one systemic therapy were excluded. Age, sex, race, and ethnicity-adjusted Cox proportional hazards models compared outcomes to psoriasis patients not treated systemically for the same follow-up time.

Results: Ustekinumab predicted increased NMSC risk after two years (HR 1.38 [95% CI 1.02-1.86] p=0.03) and five years of treatment (HR 1.75 [1.33-2.30] p<0.0001). IL-23 inhibitors were not significantly associated with NMSC risk at two years (HR 0.68 [0.44-1.06] p=0.09) or five years (HR 0.59 [0.22-1.57] p=0.3). Notably, IL-17 inhibitors were associated with a lower NMSC risk at two years (HR 0.62 [0.44-0.89] p=0.007) and five years (HR 0.55 [0.33-0.94] p=0.03).

Conclusions: Ustekinumab was associated with an increased risk of NMSC after two and five years of treatment- a finding not detected by existing meta-analyses but suggested by post-marketing reports of squamous cell carcinoma. IL-17 inhibitors and IL-23 inhibitors were not associated with increased risk of skin cancer; in fact, IL-17 inhibitors may be protective against NMSC. These findings may have implications for skin cancer screening, especially in patients with additional risk factors

#18
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Neoadjuvant Therapy with a Combination of BRAF and MEK-Inhibitors - the Key to Surgical Optimization and Success: Case Report of a BRAF V600E Mutated Ameloblastoma in a 75-Year-Old Female that was Treated with Neoadjuvant Therapy including BRAF and MEK Inhibitors Prior to Surgical Resection

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INTRODUCTION: Ameloblastomas represent ~10% of tumors residing in the mandible and maxilla. Two-thirds of cases harbor the BRAF V600E mutation which correlates to more aggressive behavior. The mutation results in constant BRAF activation which enhances EGFR, promoting cell proliferation. Anti-EGFR therapies fail to silence these tumors. To combat this, off-label use of BRAF and MEK inhibitors have been utilized in isolated cases. Our case offers a novel presentation of neoadjuvant therapy with a combination of these two drugs in an older patient, further demonstrating the exciting therapeutic effects.

CASE PRESENTATION: A 76-year-old female presented with a left mandibular ameloblastoma diffusely positive for the BRAF V600E mutation. Patient requested neoadjuvant treatment due to scarring concerns and was subsequently started on 300mg dabrafenib and 2mg trametinib daily, a BRAF and MEK inhibitor respectively. After 3 cycles, patient experienced worsening nausea and fatigue. Dabrafenib dosage was decreased to 200mg daily which resolved symptoms. To date, she has completed ~18 months of treatment, and the tumor continues to shrink. At a recent follow up, the patient is demonstrating an excellent response to treatment with a tumor size reduction of >50% confirmed via repeat CT imaging. Her cell counts and LFTs continue to remain WNL. The patient has elected to undergo surgery.

CONCLUSION: The face is essential to one's identity and interpersonal communication. Therefore, quality of life can be significantly impaired by ameloblastomas in general, but also recurrent resections from an inadequate primary surgery. This case report demonstrates the efficacy of neoadjuvant therapy with a combination of BRAF and MEK inhibitors in a patient of older age. Size reduction of these tumors can reduce the extent of mutilating surgery, optimize facial restoration and aesthetics, and lessen local recurrences.