WashU Medicine

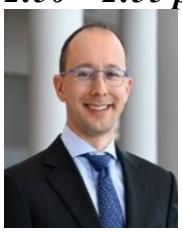
2025 EXPLORE Symposium

Wednesday, October 15, 2025

2:45 – 2:50 pm ***Welcome and Remarks***

Eva Aagaard, MD
Carol B. and Jerome T. Loeb Professor of Medical Education
Senior Associate Dean and Vice Chancellor for Medical Education

2:50 – 2:55 pm ***Introduction of Keystone Speaker***



Terrance T. Kummer, MD, PhD
Assistant Dean for Medical Student Research and Scholarship
Director, EXPLORE Program
Associate Professor of Neurology
Department of Neurology

2:55 – 3:25 pm ***Keynote Address***

Jeffrey I. Gordon, MD
Dr. Robert J. Glaser Distinguished University Professor and
Director, The Edison Family Center for Genome Sciences and Systems Biology
Professor, Pathology & Immunology
Professor, Medicine
Professor, Developmental Biology
Professor, Molecular Microbiology

3:30 – 4:30 pm ***Medical Student Presentations***

Kelly Gaudian
Multiomics analysis reveals NRF2 as predictive of radiation resistance in laryngeal cancer

Michael Youssef
Health Policy and Direct Democracy: Predictors of Successful Measures, 2010-2024

Danielle Wilder
Improving Overdose Preparedness Through Design, Distribution, and Real-World Impact

Jose Mazzitelli Perez
Targeting the Bone Marrow Niche to Modify Disease Progression in Rett Syndrome

4:30 – 5:30 pm ***Poster Presentations and Reception***

Student Poster Presenters

Advocacy - Global Health

1. Caroline Cary
2. Priscilla Cruz
3. Mackenzie Cunningham
4. Aditi Gupta
5. Cade Herrera
6. Ruth Ling
7. Tullis Liu
8. Victoria Ogbeifun
9. Carrie Reaver

Education Pathway

10. Annika Agrawal
11. Sofia Cohen
12. Eleanor Duncan
13. McKayley Green
14. Marykate Hill
15. Lillee Izadi
16. Elisa Kodama
17. Arjun Mehendale
18. Karan Mirpuri
19. Kathryn Silberstein
20. Helen Struble
21. Connor Alder

Innovation Pathway

22. Adam Boukind
23. Sundeep Chakladar
24. Daniel Fulkerson
25. Daehee Jeong
26. Evan Mihalakakos
27. Shree Pari
28. Jeevan Rajkumar
29. Heath Rutledge-Jukes
30. Nicholas Speller

Research Pathway

31. Nadia Ahmedin
32. Anton Alyakin
33. Angela Anaeme
34. Ash Ashok
35. Naman Baraya
36. Andrew Bellas
37. Braeden Benedict
38. Siddhant Bhat
39. Ethan Blum
40. Gabriel Boebel
41. Chris Bozorgmehr
42. McNeely Bradley
43. Ross Buchman
44. William Carter
45. Kevin Chen
46. Grace Chen
47. Laura Crook
48. Lucas Cruz
49. Marcus Curlin
50. Soliman Daniel
51. Daniel Du
52. Judson Ellis
53. Dane Fernandez
54. Maya Ferrell
55. Adam Fogel
56. Oliver Forst
57. Francisco Narro Garcia
58. Abigail Fulkerson
59. JT Galla
60. Mansi Garneni
61. Dominic Gaziano
62. Yodahe Gebreegziabher
63. Annabel Geissbuhler
64. Jake Goldfarb
65. Pavithr Goli
66. Isabella Gomes
67. Ameer Haider
68. McKenzie Halpert
69. Jorin Hanson
70. Miguel Hernandez Rovira
71. Sean Hollander
72. Jon Ince
73. Hamza Jalal
74. Syeda Jannath
75. Kimberly Johansson
76. Sofia John
77. Sydney Kinkade
78. Michael Lazarus
79. Nicholas Leonard
80. Ethan Lewis
81. Mark Li
82. Joseph Litrel
83. Katherine Long
84. Vikranth Mallikarjun
85. Cyriac Manjaly
86. Lane McCoy
87. Mayande Mlungwana
88. Mitchell Mologne
89. Mason Muir
90. Khai Nguyen
91. Don Nguyen
92. Andrea O'Riordan
93. Shelei Pan
94. Kavya Parekh
95. Noah Poulin
96. Eshan Sane
97. Aditya Santoki
98. Jack Schnieders
99. Danielle Serota
100. Cory Sharp
101. Byron Sigel
102. Sydney Singer
103. Justin Sofia
104. Isabella Song
105. Riley Stanford-Hill
106. Brendan Stapley
107. Caleb Vandenberg
108. Felicia Wang
109. Danyi Wang
110. Joanne Wang
111. Christian Wright
112. Mark Xiao
113. Anna Yang
114. Caroline Youdes
115. Matthew Yuan

WashU Medicine EXPLORE Program Team

Terrance Kummer, MD, PhD, Program Director
Caline Mattar, MD, FIDSA, Global Health Pathway
Caitlin McCurtry, PhD, SM, Advocacy Pathway
Sara Greer, MD, Education Pathway
Linda Wu, DO, MBA, Innovation Pathway
Patrick Aguilar, MD, MBA, Innovation Immersion Co-Lead
Dorina Kallogjeri, MD, MPH, Research Pathway
Lauren Roland, MD, MSCI, Research Pathway
Rosalyn Bradshaw-Robinson, Program Manager

Advocacy – Global Health Pathway

Poster: 1
Student Name: Cary, Caroline
Phase/Class: MD5
Project Title: Screen and Say 'Just Don't Drink'? A Systematic Review of International Guidelines for Treating Alcohol Use Disorder in Pregnancy
Mentor(s): Xu, Kevin
Mentor Department: Psychiatry

Alcohol is the most common substance exposure in pregnancy, but medications for alcohol use disorder (AUD) have received limited attention compared to other drugs. We convened an international team of OBGYN and addiction medicine experts to perform a systematic review of clinical practice guidelines (CPGs) for AUD treatment during pregnancy. Of over 800 records identified in PubMed and >20 CPG databases globally, we identified 21 guidelines spanning the U.S. (e.g. ACOG), Canada (e.g. SOGC), UK (e.g. NICE), Australia and New Zealand (e.g. RANZCOG), with WHO guidelines capturing other countries. We found that all guidelines strongly recommended universal alcohol screening and brief intervention yet provided no recommendations on MAUD continuation or discontinuation during pregnancy. Treatment recommendations consistently ended at diagnosis and referral, creating a significant gap in the cascade of care. Limited MAUD guidance aligns with U.S. data showing over 90% of birthing people with AUD do not receive evidence-based treatment.

Poster: 2
Student Name: Cruz, Priscilla
Phase/Class: Phase 3
Project Title: World Medical Association Global Physician Migration Report
Mentor(s): Mattar, Caline
Mentor Department: Medicine

The World Medical Association recognizes the right of physicians and healthcare professionals to exercise mobility, while also acknowledging the financial investment that source countries put into educating physicians and the consequent losses that are experienced among source country health systems when migration occurs. Moreover, these losses are experienced more significantly by low- and middle-income countries, with Global South nations bearing a disproportionately high burden of excess morbidity and mortality from physician emigration. In this report, we seek to go beyond numbers and explore case studies from eleven countries with data submitted by their National Medical Associations. We identify economic and professional drivers as leading causes of physician migration for the countries featured in this report. We additionally identify country-specific challenges to migration and physician retention. Finally, we outline several best practices to encourage knowledge sharing and mitigate the health system losses created in countries with high physician emigration.

Poster: 3
Student Name: Cunningham, Mackenzie
Phase/Class: Phase 3
Project Title: Utilizing Staff Perceptions to Guide Implementation of a Safe Sleep Program
Mentor(s): Colson, Eve; Colvin, Bryanna
Mentor Department: Pediatrics

The Proctor Conceptual Model for Implementation Science (PCMIS) can help identify facilitators and barriers of successful implementation to bridge the bench to bedside gap. An educational intervention has proven effective in promoting safe sleep, but how to best implement it remains unclear. We used a qualitative design informed by the PCMIS to conduct semi-structured interviews with hospital staff from US regions with SUID rates higher than the national rate. Interviews focused on facilitators and barriers to parent-initiated sign-up via QR code and toolkit ideas that could facilitate implementation at multiple levels. Interview transcripts were reviewed using rapid qualitative methods. 21 total hospital staff were interviewed from 8 states across multiple demographic categories. Staff identified multiple facilitators and barriers to implementation at the mother, hospital staff, and administrative levels, and made recommendations regarding effective implementation. This approach is a critical first step toward implementing the intervention.

Poster: 4
Student Name: Gupta, Aditi
Phase/Class: Phase 1/Year 2
Project Title: 2Cardiovascular Division and Global Health Center, Washington University School of Medicine, St. Louis, MO, USA
Mentor(s): Deych, Elena; Acosta, Isaac; Llibre-Guerra, Jorge; Anubha, Agarwal; Obionu, Ifeoma
Mentor Department: Medicine

Introduction: Cardiovascular disease, largely driven by hypertension, is now the leading cause of death in adults over 65 in Latin America. Despite increased awareness and effective therapies, hypertension detection and treatment remain low. Methods: We analyzed cross-sectional data from 10,348 adults aged ≥65 in five Latin American countries using the 10/66 survey (2004-2008). Hypertension was defined using 2017 ACC/AHA guidelines (BP ≥130/80 mmHg). We used descriptive statistics to assess hypertension prevalence, awareness, treatment, and control. Results: Mean age was 75 years, and 65% were female. Overall, 69% had elevated BP (28.8% stage 1, 40.2% stage 2). 59.5% were aware of their hypertension diagnoses. Only 46.9% were receiving treatment, and just 27.3% of those treated had controlled BP. Conclusions: Our findings from the 2004–2008 dataset provide a valuable baseline for understanding hypertension management and highlight the need for ongoing surveillance in adapting context-specific CVD prevention strategies

in the region.

Poster: 5
Student Name: Herrera, Cade
Phase/Class: Phase 1/Year 2
Project Title: The One Thing They Cannot Have: The Flawed Integration of “Indigeneity” into Western Medicine
Mentor(s): Jain, Radhika
Mentor Department: Medicine

The movement to incorporate monolithic "Indigeneity" into Western medicine is epistemically flawed and perpetuates "cognitive extractivism." Using my perspective as a Lakȟóta, I argue that this trend reflects a hegemonic misunderstanding that reduces diverse, relationship-based Tribal knowledges into a single, extractable resource by the healthcare system. Using Gramsci's theories to frame my argument, I posit that this process perpetuates colonial patterns of subjugation rather than nurturing genuine inclusion.
I further my argument by contending that true integration cannot be achieved by teaching non-Natives simplified concepts. Instead, the only ethical and epistemically valid solution is to address the severe underrepresentation of Native people in the medical field. By empowering local Native "organic intellectuals" to become physicians, medicine can benefit from an authentic, community-specific fusion of cultural wisdom and clinical practice. This approach prioritizes uplifting Native communities and practitioners over the superficial extraction of cultural aesthetics for a dominant system.

Poster: 6
Student Name: Ling, Ruth
Phase/Class: Phase 3
Project Title: Substance Use Disorder and Substance Use-Related Mortality in U.S. Immigration Detention (2018-2025)
Mentor(s): Xu, Kevin
Mentor Department: Psychiatry
Contributed significantly to project: Gong, Lisa

Substance use disorder (SUD) is a significant but understudied contributor to morbidity and mortality among individuals in immigration detention. We conducted a retrospective cross-sectional analysis of all publicly available ICE Detainee Death Reviews (DDRs) between April 2018 and May 2025. A total of 69 DDRs were reviewed, with 26 deaths identified as involving likely substance use or related medical or psychiatric conditions. Among the 26 individuals with probable SUD involvement, only 2 (7.7%) received formal screening, and none had a documented diagnosis, referral, or evidence-based SUD treatment. Ten individuals (38.5%) died from complications potentially related to untreated substance use, including alcohol withdrawal, opioid withdrawal, and cirrhosis. This analysis reveals gaps in the identification and management of substance use among individuals who died in ICE custody. Findings underscore the need for standardized behavioral health protocols, improved emergency response systems, and broader transparency around medical care in immigration detention settings.

Poster: 7
Student Name: Liu, Tullis
Phase/Class: Phase 1/Year 2
Project Title: Comparing Rural and Urban Firearm Injury: Trauma Center Data from Saint Louis, Missouri
Mentor(s): Kranker, Lindsay; Spruce, Marguerite
Mentor Department: Surgery

Introduction: Our objective was to compare characteristics of rural versus urban patients presenting with an acute firearm injury (FI). Methods: This is a retrospective observational cohort study of FI patients at a level 1 trauma center between 06/2018-10/2024. We collected data on demographics, insurance, social vulnerability index (SVI), rurality, and FI intent. Results: Rural FI patients were more likely to be White (55.8% vs 6.4%, p<0.001), older than 65 years old (6.9% vs 1.7%, p=0.018), and have self-inflicted FI (9.1% vs 1.5%, p<0.001). Urban FI patients were more likely to be Black (92.0% vs 42.3%, p <0.001), male (85.5% vs 75.0%, p=0.047), assault FI (93.9% vs 80.0%, p<0.001), highest SVI quartile (58.6% vs 32.5%, p<0.001), and require emergent operative interventions (44.6% vs 28.6%, p=0.025). Conclusions: FI injury differences between rural and urban cohorts reflect two distinct dimensions of the American FI public health epidemic. This argues for community-specific FI prevention strategies for these populations.

Poster: 8
Student Name: Ogbeifun, Victoria
Phase/Class: Phase 1/Year 2
Project Title: Interventions to support substance use recovery among human trafficking survivors: A scoping review
Mentor(s): Dell, Nathaniel
Mentor Department: Psychiatry

Substance misuse and human trafficking share complex interrelationships. Since substance misuse is common among survivors, this scoping review identified empirical research on substance use treatment, harm reduction, and recovery supports. Reviewers searched multiple databases and performed forward and backward citation chaining of peer-reviewed studies and grey literature. Eligible studies included child, adolescent, or adult sex/labor trafficking survivors, tested an intervention to reduce substance use, and reported substance-related outcomes. Five studies met criteria; most reported improvements, yet the evidence base remains small. Notably, studies rarely evaluated interventions designed specifically for trafficking survivors with substance misuse; to support survivors effectively, future work should develop and test survivor-specific, substance use–focused interventions. Data were narratively summarized and presented in tabular form, with attention to variation in interventions and outcomes across settings and participant

characteristics. A survivor advisory board informed interpretation and dissemination. Findings aim to inform future research, practice, and policy.

Poster: 9
Student Name: Reaver, Carrie
Phase/Class: Phase 2
Project Title: Bridging the digital divide at WashU: Generative AI to Improve Online Orthopedic Patient Education
Mentor(s): Goldfarb, Charles
Mentor Department: Orthopaedic Surgery

Spanish-speaking patients in the U.S. face persistent barriers to online orthopedic information due to the limited availability of Spanish-language resources and inconsistent access to language-assistance services. Generative artificial intelligence (AI) presents a promising solution to address this gap. We conducted a cross-sectional analysis of the websites of 203 U.S. academic orthopedic institutions listed on the 2024 ERAS directory and found that only 12% offered translated patient education materials. We then modeled an AI intervention using 30 articles from WashU's orthopedic patient library using ChatGPT-4o, as no Spanish resources are currently available, using validated prompt engineering strategies. Our prompt engineering model demonstrated significantly improved readability and translation quality (p<0.05) compared to original articles. These findings underscore the potential for trained AI models to effectively expand the availability and accessibility of Spanish-language resources, especially in low-resource settings. Further work has included real-time implementation of AI-generated Spanish-language content on WashU orthopedic websites.

Oral Presenter
Student Name: Youssef, Michael
Phase/Class: Phase 3
Project Title: Health Policy and Direct Democracy: Predictors of Successful Measures, 2010-2024
Mentor(s): McMurtry, Caitlin
Mentor Department: WashU Brown School
Contributed significantly to project: Siamof, Cerise

Prior research has studied determinants of success for ballot measures writ large, however examination of healthcare-related measures (HRM) remains limited. This study addressed three questions: are HRM more likely to pass than non-healthcare-related measures (NHRM); do HRM draw more oppositional campaign spending than NHRM; and among HRM, what characteristics predict success? We identified 84 HRM in 32 states from 2010-2024 and 335 NHRM that appeared alongside them on the same ballot (n=419). We used regression analyses to examine campaign outcomes and spending, and controlled for factors such as ballot language and state partisan control. Findings indicate that HRM were significantly more likely to pass than NHRM, despite drawing greater oppositional spending, which was associated with lower odds of success for all measures. Results indicate that HRM pertaining to "morality" are viewed differently by interest groups and voters, and that among HRM, oppositional spending is the strongest electoral outcome predictor.

Education Pathway

Poster: 10
Student Name: Agrawal, Annika
Phase/Class: Phase 1/Year 2
Project Title: Evaluation of a Novel Disability Elective
Mentor(s): Petersen, Kristina
Mentor Department: Office of Medical Student Education

People with disabilities (PWD) face significant barriers to equitable healthcare, including lack of provider training in accessible care. Yet, as of 2017, only 52% of medical schools reported teaching any disability curriculum, with few simultaneously targeting knowledge, skills, and attitudes. We evaluate the efficacy of a Phase 3 Keystone Integrated Science Course (KISC) in increasing knowledge about, and positive attitudes toward, disability. Knowledge and skills were assessed via a multiple-choice assessment and simulated patient interactions. Attitudes were assessed quantitatively via pre- and post-course Likert-type instruments and qualitatively via end-of-course narrative feedback, which was subjected to directed content analysis. Across six student cohorts (n=22), a Wilcoxon signed-rank test showed a significant increase in positive attitudes toward PWD (W=0, p<0.001), and all students achieved competency in knowledge and skills. These data demonstrate that this KISC offers a novel disability curriculum which effectively educates medical students about disability health while concomitantly changing attitudes.

Poster: 11
Student Name: Cohen, Sofia
Phase/Class: MD5
Project Title: What Defines a 'Goals of Care' Conversation for Surgeons
Mentor(s): Kopar, Piroska
Mentor Department: Surgery

In the age of increased patient autonomy, “shared-decision making” and value-focused approaches to treatment, there is rising interest in how goals are discussed in clinical practice. However, little is known about what constitutes a ‘goals of care’ (GOC) conversation for surgeons and their attitudes and timing around these conversations. We aimed to evaluate attending surgeon attitudes, definitions, practices, and beliefs regarding ‘goals of care’ conversations within the field of surgery. A survey was emailed to attending surgeons from the departments of surgery at Washington University in St. Louis School of Medicine (WUSM). All respondents agreed that it is important to ask patients about their goals, however, 28.2% reported not asking patients about their goals prior to surgical consent and over 50% have not received any formal education on how to conduct GOC conversations. Lastly, GOC conversations appear to be context dependent, and definitions of GOC are not uniform among surgeons.

Poster: 12
Student Name: Duncan, Eleanor
Phase/Class: Phase 1/Year 2
Project Title: The influence of personality on professional behavior and choices in medicine among undergraduate and graduate medical trainees: a scoping review
Mentor(s): Schneider, John
Mentor Department: Otolaryngology

Incorporating consideration for personality differences during undergraduate and graduate medical education may help students be more metacognitive in their professional behaviors and career choices. This scoping review synthesizes literature on how personality influences professional behavior and clinical decision making in medicine. Several validated personality assessments exist, most following the five factor model, which characterizes individuals by extraversion, agreeableness, conscientiousness, neuroticism, and openness. These factors influence workplace strengths and weaknesses, such as delivering bad news, and professional preferences, such as career choice. Multiple databases will be queried to identify studies on personality’s impact in six domains: clinical decision making, interprofessional communication, collaboration, integrity, adaptability, and empathy. By synthesizing current evidence, this review will highlight trends, gaps, and applications for integrating personality awareness into medical curricula. Findings may inform targeted educational strategies, support professional identity formation, and optimize learner development.

Poster: 13
Student Name: Green, McKayley
Phase/Class: Phase 1/Year 2
Project Title: Prehospital Chemical Restraint: Curriculum Development for Paramedic Education
Mentor(s): Li, James
Mentor Department: Emergency Medicine

Background: Chemical restraint is a common yet high-risk intervention in the prehospital environment. Improper use has serious consequences for both patients and providers, with recent high-profile cases drawing national attention to its safety. In response, many EMS systems have revised protocols and scopes of practice. These policy changes, however, are unlikely to succeed without effective education for frontline providers.
Methods: Based on a targeted needs assessment, a two-hour curriculum was designed for paramedic students at CHEMS. The first hour consisted of didactic instruction with active learning strategies, followed by a one-hour simulation and semi-structured debrief.

Results/Future Directions: A pilot with one student cohort demonstrated improved self-reported confidence in assessment and procedural skills related to chemical restraint. Next steps include full implementation with additional cohorts, formal evaluation of knowledge and confidence outcomes, and potential adaptation for continuing education of practicing paramedics.

Poster: 14
Student Name: Hill, Marykate
Phase/Class: Phase 1/Year 2
Project Title: Program Evaluation of Peer Support for Challenging Life Events
Mentor(s): Duncan, Jennifer
Mentor Department: Pediatrics

Background: Washington University's Graduate Medical Education has implemented a new peer support program for residents/fellows to request support when experiencing a challenging life event (eg. divorce, miscarriage, illness/death of a family member). This program pairs a resident/fellow with a volunteer trainee or faculty member who has experienced a similar life event and received education in providing psychological first aid to colleagues. Methods: Our study will evaluate this program using qualitative methods. Individual interviews will be conducted with requestors of support and peer supporters. Interviews will explore the experience with peer support, feedback on the match process, the helpfulness of interactions, and barriers to support access. The interview transcripts will be thematically coded by 3-4 project members. Results and Conclusion: The results of this study will be used to improve the program for future trainees and to develop new methods of providing accessible care to medical trainees of all levels.

Poster: 15
Student Name: Izadi, Lillee
Phase/Class: Phase 1/Year 2
Project Title: Narrative Themes and Bias in Plastic Surgery Residency Applications:
Methods for an Ongoing Study of Demographics and Match Outcomes
Mentor(s): Leis, Amber; Sacks, Justin; Currie, Kelly
Mentor Department: Surgery
Contributed significantly to project: Jeong, Jake; Marks, Caitlin

Despite its increasing competitiveness, the residency admissions process for integrated Plastic and Reconstructive Surgery (PRS) remains poorly understood, particularly regarding the role of qualitative application materials. As traditional quantitative metrics, such as USMLE Step 1 and clerkship grades, transition to pass/fail formats, greater emphasis is placed on narrative components, including personal statements and letters of recommendation (LORs), both of which remain highly subjective and potentially vulnerable to bias. This study proposes a two-phase, retrospective and prospective mixed-methods analysis of PRS residency application personal statements and LORs to better understand how narrative materials influence match outcomes and reflect potential bias across race and gender. Findings from this study will provide insight into how qualitative elements contribute to applicant selection and support applicants and advisors as they navigate the evolving PRS match landscape.

Poster: 16
Student Name: Kodama, Elisa
Phase/Class: Phase 3
Project Title: Across the Spectrum: Varied Imaging Appearances and Management of Ductal Carcinoma In Situ
Mentor(s): Bennett, Debbie; Lee, Michelle; Chiu, Sherwin
Mentor Department: Radiology
Contributed significantly to project: Jeong, Jake; Marks, Caitlin

Ductal carcinoma in situ (DCIS) is a non-invasive breast malignancy that has a range of presentations on imaging including classic microcalcifications or subtle architectural distortion. More extensive or high-grade DCIS carries a greater risk of cancer progression and adverse outcomes, while low-grade disease may be safely observed in selected patients. As research and understanding of DCIS continues to grow, management strategies also evolve from a one-size-fits-all approach to individualized and risk informed treatments. Thus, imaging plays a critical role in diagnosis, prognostication, and guiding therapy. Here we review the spectrum of DCIS through a series of clinical cases, correlate them with histopathologic subtypes, and summarize the current treatments. We also explore the current literature and ongoing clinical trials that study active surveillance for low-risk DCIS (COMET, LORD, RECAST, LORIS).

Poster: 17
Student Name: Mehendale, Arjun
Phase/Class: Phase 2
Project Title: Assessment of Pediatricians' Awareness and Management of Craniosynostosis: A Prospective Survey Study

Introduction: Craniosynostosis is a congenital condition characterized by the premature fusion of cranial sutures. Pediatricians are often the first providers to evaluate infants for this condition. The aim of this study was to assess pediatricians' comfort in managing craniosynostosis.
Methods: A 17-item survey was developed to assess pediatricians' education on craniosynostosis, current management practices, and demographic information. The survey was emailed to pediatricians across WashU, and descriptive statistics were calculated.

Mentor(s): Patel, Kamlesh
Mentor Department: Surgery

Results: Of the 16 surveys returned, 13 were completed in full. Seven respondents reported receiving education on craniosynostosis during practice, whereas seven indicated they had not. Four respondents were “somewhat uncomfortable” diagnosing craniosynostosis, four were “somewhat comfortable,” and five were “comfortable.” The most frequently cited barrier to early diagnosis was difficulty distinguishing craniosynostosis from positional plagiocephaly.
Conclusion: These preliminary findings suggest that more targeted educational resources on craniosynostosis should be made available to pediatricians.

Poster: 18
Student Name: Mirpuri, Karan
Phase/Class: Phase 2
Project Title: Expanding Diversity: A Novel Pathway Program for Students Interested in Sexual and Gender Minority Health
Mentor(s): Dao, Anthony
Mentor Department: Medicine
Contributed significantly to project: Mallory, Nora

Sexual and gender minority (SGM) individuals face health outcome disparities. Recent data suggests SGM communities are underrepresented in medicine. Pathway programs targeting URiM communities have been successful in attracting participants to healthcare careers and increasing chances of admission and matriculation to graduate education. We present data from our pilot pathway program targeting high-school students interested in SGM health to increase awareness of SGM health needs and interest in healthcare careers. 7 students participated in the first cohort. Retrospective pre-post Likert-scale survey (N=5) and 1:1 interviews (N=4) were conducted for program evaluation. All reported increased familiarity regarding unique SGM-related health needs and greater confidence in the pre-health process. We are conducting thematic analysis of interview transcripts. Initial qualitative feedback praised the opportunities for casual engagement with students/professionals and suggested increasing program duration. Future directions include increasing interprofessional representation, expanding public school outreach, and developing an open-access guide for program implementation.

Poster: 19
Student Name: Silberstein, Kathryn
Phase/Class: Phase 1/Year 2
Project Title: Developing a Healthcare Leadership Curriculum for Residents
Mentor(s): Wu, Linda
Mentor Department: Pediatrics

As the medicine and healthcare industries have become increasingly complex, hospitals with administrators trained as doctors have been associated with decreased physician burnout and improved patient outcomes. Despite this, formal leadership development programs (LDPs) within graduate medical education have remained limited. Thus, the goal of this project is to develop and administer a leadership development program for medical residents. To begin determining the programmatic contents, a general needs assessment was conducted. A review of literature surrounding LDPs for current physicians highlighted several learning targets shared by programs that demonstrated more robust organizational outcomes. These included healthcare systems knowledge, technical business management knowledge, interpersonal skills, and, most importantly, emotional intelligence competencies. Going forward, the ongoing targeted needs assessment focuses on gathering information from medical executives, residency program directors, and residents to determine the most important and applicable curricular content, as well as feasible program structure, for the project’s target audience.

Poster: 20
Student Name: Struble, Helen
Phase/Class: Phase 1/Year 2
Project Title: Deciding Together: Pilot Study of a Shared Decision-Making Aid for Pediatric Pilonidal Disease
Mentor(s): Yeh, Andrew
Mentor Department: Surgery

Introduction: Pilonidal disease (PD) is a common adolescent condition impacting the sacrococcygeal region that has many treatment options. Decision aids (DA) assist patients and caregivers with medical decisions. We aimed to assess efficacy and acceptability of a novel PD DA in a general population.
Methods: 248 participants from an online research panel were asked to imagine having an adolescent with PD and to review our DA describing treatment options. Surveys administered before and after review measured decisional conflict (DC) and content knowledge.
Results: After quality checks, data from 219 participants were analyzed. Participants were 37.7% male, 73.5% White, and had a mean age of 42.3 years old; 73.5% demonstrated adequate health literacy. The DA reduced DC (26.76% to 19.25%, p=0.012) and improved knowledge scores (43.50% to 50.33%, p<0.001).
Conclusion: Our DA reduced DC, enhanced knowledge, and was well-received in a pilot population. Future studies will investigate use in clinical settings.

Poster: 21
Student Name: Alder, Connor
Phase/Class: Phase 1/Year 2

Problem: Therapists in private practice spend 10+ hours per week on documentation, with nearly 40% completing notes at home more than 24 hours after sessions. This burden contributes to burnout, weaker therapist–patient connection, and delayed insurance reimbursements that harm practice cash flow.

Project Title: Brivy: AI-Powered Documentation for Therapists
Mentor(s): Aguilar, Patrick
Mentor Department: Medicine

Solution: Brivy is an AI-powered scribe built specifically for therapists. By recording a session, therapists instantly receive a SOAP note, ICD-10 billing codes, and session insights.
Innovation: Unlike general-purpose AI scribes, Brivy includes features specific to mental health like emotional tone tracking, session themes, and clinic-level dashboards for quality improvement.
Progress: Launched a live MVP in Dec 2024 with HIPAA-compliant notes, ICD-10 coding, and self-service accounts. Early adoption includes five users across two subscription tiers. Brivy was recognized with the Overall Best Innovation award during the WashU Innovation Explore Pathway.
Impact: Brivy reduces therapist burnout, streamlines documentation, and accelerates reimbursement, enabling therapy practices to scale more sustainably.

Innovation Pathway

Poster: 22
Student Name: Boukind, Adam
Phase/Class: MD5
Project Title: Antioxidative Surgical Adhesive with Superior Hemostatic Efficacy and Vascular Patency in Preclinical Surgery Models
Mentor(s): Zayed, Mohamed; Sacks, Justin; Li, Xiaowei
Mentor Department: Surgery

Background: Conventional hemostatic sealants such as cyanoacrylates and fibrin-based products are limited by toxicity, poor compatibility, and lack of oxidative protection. Oxidative stress during wound healing contributes to tissue damage and impaired outcomes. We developed a novel antioxidative surgical adhesive incorporating thioether and disulfides bonds to enable targeted redox protection with strong hemostatic performance.
Methods and Results: The adhesive showed no cytotoxicity across multiple cell lines over 7 days. It reduced blood loss by 79% in liver injury (166 ± 67.2 vs. 35 ±10 mg, n = 3) and 88% in kidney injury (82 ± 39 vs. 9.7 ± 4.3 mg, n = 3) versus untreated controls (P<0.05). The rat femoral puncture survival model confirmed effective hemostasis. Doppler ultrasound demonstrated 100% vascular patency at 30 days without thrombosis.
Conclusion: Our adhesive shows promise in hepatobiliary surgery, renal procedures, and vascular anastomoses requiring rapid hemostasis, biocompatibility, and antioxidative protection.

Poster: 23
Student Name: Chakladar, Sundeep
Phase/Class: Phase 1/Year 1
Project Title: Development and Validation of an Automated Pipeline for the Detection of Monteggia Fractures in Pediatric Radiographs
Mentor(s): Hosseinzadeh, Pooya
Mentor Department: Orthopaedic Surgery

Pediatric Monteggia fractures are frequently misdiagnosed since radial head dislocations are easily overlooked in the setting of prominent ulnar fractures. Missed or delayed diagnosis can result in significant long-term complications, necessitating improved diagnostic tools. This study investigates whether a novel automated deep learning pipeline trained on 320 radiographs can accurately identify these subtle injuries. Our two-step method first uses a U-Net++ neural network to segment the capitellum and radial neck to measure radial head displacement. An EfficientNet-B1 binary classifier is then implemented to identify ulnar fractures. For the detection of radial head displacement, the pipeline achieved a sensitivity of 92.3%, specificity of 96.3%, and accuracy of 95.0%. The ulnar fracture detection model achieved an accuracy of 87.5% and an area under the curve of 0.923. This automated pipeline shows high diagnostic performance, highlighting its potential as a clinical decision support tool for detecting Monteggia fractures.

Poster: 24
Student Name: Fulkerson, Daniel
Phase/Class: Phase 3
Project Title: Evaluating the accuracy and reliability of a large language model in coding common orthopaedic procedures
Mentor(s): Pereira, Daniel
Mentor Department: Orthopaedic Surgery
Contributed significantly to project: Haider, Ameer

Background: Large language models (LLMs) have shown promise in automating Current Procedural Terminology (CPT) coding for orthopaedic surgeries.
Methods: Thirty procedures and the corresponding CPT codes were selected from across the orthopaedic subspecialties of sports, foot and ankle, and hand. CPT codes were validated using the AAPC “Codify” tool for ground truth analysis. An institutional ChatGPT-4o-based LLM was prompted to generate CPT codes based only on the procedure name, with three trials per procedure. Responses were scored as “correct” (+1), “partially correct” (+0.5), or “incorrect” (+0). Performance was assessed as a percentage of the maximum possible score. For incorrect responses, the LLM was re-prompted.
Results: Initial LLM performance was 88.9%, improving to 93.9% after re-prompting. Performance varied by subspecialty (P=0.018), with lower scores in hand compared to sports (P=0.019).
Conclusions: This study demonstrates accurate, reproducible LLM-driven coding, suggesting potential applications in reducing costs and administrative workload for orthopaedic clinical practices.

Poster: 25
Student Name: Jeong, Daehee
Phase/Class: MD5
Project Title: Introducing the VasoChip: A Modular Training Tool for Objective Assessment of Microsurgical Skills
Mentor(s): li, Xiaowei

The widespread utility of microsurgery has spurred its rapid global development, which has encouraged surgical training programs to design specialized microsurgical curricula. These programs utilize diverse simulation tools to practice microvascular anastomoses, including live animal models, chicken thighs, synthetic tubes, and augmented reality. Despite the plethora of available models, no model can provide an objective quantitative evaluation of anastomotic quality, which is critical for learning and improvement.

Mentor Department: Surgery

To address this limitation, our group designed the VasoChip, which utilizes a modular network of motors, tubing, and reservoirs to transport fluid through an interchangeable anastomotic element. This device can simulate a wide range of physiologic conditions, including hydrostatic pressures and pulse rates. Importantly, the VasoChip provides objective measures of anastomotic quality by quantifying the amount of leakage. In a cohort of resident and attending physicians, the VasoChip identified experience-dependent differences in anastomotic leakage across multiple physiologic conditions.

Poster: 26
Student Name: Mihalakakos, Evan
Phase/Class: Phase 1/Year 2
Project Title: St. Louis County Jail 'Theraputic Pod' Pilot
Mentor(s): Oldeg, Paula
Mentor Department: St. Louis County Jail Medical Director

People with mental health conditions are overrepresented in jail settings, often with untreated needs and barriers to accessing care. The Saint Louis County Jail houses approximately 1,300 individuals in a facility designed for 1,232. An estimated 35% (450) have serious mental health needs, and 40% (520) have a history of substance use. Yet, only 2 psychiatric NPs and 1 LCSW are available with no therapists or counselors. Initially just an idea to introduce therapy sessions, this project now aims to establish a dedicated 'therapeutic pod' for individualized mental health and substance use disorders screening, counseling, and case management. In partnership with WashU's Brown School, the programming will include therapy sessions by LCSW trainees, jail staff skill development, and oversight and evaluation by faculty and jail staff. A 90-day reentry navigation model will be used for continuity of care upon release, aiming to reduce recidivism while promoting recovery. Piloting Winter 2025.

Poster: 27
Student Name: Pari, Shree
Phase/Class: Phase 1/Year 1
Project Title: A Novel Patient-Derived Culture and Organoid System for Mechanistic and Therapeutic Investigation in Aggressive Meningiomas
Mentor(s): Patel, Bhuvic; Kim, Albert
Mentor Department: Neurosurgery

Meningiomas are the most common primary intracranial tumors, but aggressive subtypes remain poorly characterized and resistant to standard therapies. Existing in-vitro models rely on a few canonical immortalized lines that fail to capture meningiomas' clinical and molecular diversity.
We developed a streamlined pipeline to generate matched patient-derived tumor suspensions, 2D primary cultures, and 3D organoids. Fresh specimens are processed and expanded in custom media designed to activate key proliferative signaling pathways. Tumor identity is confirmed via immunocytochemistry (ICC) using meningioma-specific markers and validated by molecular profiling.
We have successfully established multiple primary cell and organoid cultures that maintain proliferation through late passages. ICC confirms meningioma identity across lines. Whole exome sequencing revealed shared mutations and copy number alterations between original tumor samples and corresponding cell lines and organoids.
Our system offers a high-fidelity, patient-specific disease model to investigate mechanisms of invasion, therapy resistance, and novel therapeutic targets in aggressive subtypes.

Poster: 28
Student Name: Rajkumar, Jeevan
Phase/Class: Phase 1/Year 2
Project Title: Listen2URHeart: Hearing what matters in Heart Failure (HFpEF)
Mentor(s): May, Adam
Mentor Department: Cardiology

Heart Failure with Preserved Ejection Fraction (HFpEF) affects nearly 3 million Americans, accounting for 50% of all HF patients, and its prevalence is rapidly growing due to an aging population with rising cardiometabolic risk. HFpEF remains a formidable challenge for physicians and health systems due to its variable presentation, poorly understood pathophysiology, and lack of mortality-improving therapy. Listen2URHeart is an Artificial Intelligence-driven model designed to bring clarity to HFpEF care. By integrating intelligent echocardiographic analysis, comorbidity profiles, guideline-based diagnostics, and advanced phenotyping, Listen2URHeart enables physicians to model HFpEF patients and receive personalized treatment recommendations. With 750,000 HFpEF cases in the Midwest, capturing just 10% of the $20,000 annual cost per patient represents a $1.5B serviceable opportunity. As hospitals increasingly face mounting costs and quality pressures to manage HFpEF, the ability to deliver consistent and efficient care positions Listen2URHeart as a transformative solution for both patients and healthcare systems.

Poster: 29
Student Name: Rutledge-Jukes, Heath

Chronicle Pain LLC is developing Chronicle, a mobile health platform that significantly improves care for over 50 million Americans with chronic pain. Care is scattered across prescriptions, cognitive behavioral therapy, physical therapy, pain

Phase/Class: Phase 2
Project Title: Chronicle
Mentor(s): Hess Panjeton,
Mentor Department: Anesthesiology
Contributed significantly to project: Jonnalagadda, Pallavi

logging, and procedures, and adherence is often low, leading to worse outcomes and higher costs. Chronicle consolidates these elements into one app with prescription reminders, guided physical therapy, personalized medical input, centralized data storage, symptom tracking, and outcome insights. The platform also fosters social connections and supports key stakeholders, including patients, physicians, insurers, therapists, and researchers. The chronic pain market exceeds eighteen billion dollars annually, and increased adherence could save up to $1,426 per patient each year. With advisors from Washington University, Vanderbilt, and Duke, Chronicle is preparing IRB-reviewed clinical trials to validate usability, improve adherence, measure outcomes, and position the product for scalable adoption across payer and provider settings.

Poster: 30
Student Name: Speller, Nicholas
Phase/Class: Phase 2
Project Title: Aurora: The Smart-Clinical Logbook That Optimizes Clinical Training to Reduce Medical Errors
Mentor(s): Wu, Linda
Mentor Department: Medicine
Contributed significantly to project: Qiu, Micheal; Simper, Mackenzie; Chang, Justin

Every year, 4 million people experience a delayed or missed diagnosis leading to $36B in excess cost and increased patient harm. Currently, trainees rely heavily on senior physicians' experience and exposure to cases to master clinical reasoning and avoid medical errors. However, there is limited time to learn from senior physicians on the wards. Hence, trainees would benefit from having the wisdom of a senior physician at their fingertips while working through clinical cases, to maximize the learning from each patient. Our envisioned solution, Aurora, is a smart-clinical logbook for trainees to record and work through each step of a patient case. By optimizing the learning opportunities from each patient encounter, Aurora will help trainees more efficiently master clinical reasoning and decision making, as well as medical management and documentation. Here we present preliminary development of our educational platform Aurora.

Oral Presenter
Student Name: Wilder, Danielle
Phase/Class: Phase 3
Project Title: Improving Overdose Preparedness Through Design, Distribution, and Real-World Impact
Mentor(s): Wu, Linda
Mentor Department: Pediatrics

Despite widespread naloxone distribution, 85% of owners don't carry it—leaving critical gaps in bystander response. We founded nCase Technologies to create NALOX-1, a compact, durable case designed to increase real-world naloxone carriage and overdose preparedness. NALOX-1 was developed through an iterative process centered on usability principles and input from harm reduction workers, physicians, and those with lived experience. NALOX-1 is utility patent-pending, manufactured from soft thermoplastic rubber in China, and compatible with 20+ emergency nasal sprays including NARCAN®. Over 5,000 units have been distributed across 50 states, including 600 donated, with over 12 confirmed lives saved. nCase Tech raised $135K in non-dilutive funding, secured 3 trademarks, and earned top awards in 8 of 16+ national business competitions. Now expanding into university partnerships, naloxone distributors, and institutional procurement, nCase Tech is a scalable, stigma-aware public health tool designed to protect not only the medication—but the person carrying it.

Research Pathway

Poster: 31
Student Name: Ahmedin, Nadia
Phase/Class: Phase 3
Project Title: Molecular Prevention of Early-Onset Colorectal Cancer – Are We There Yet?
Mentor(s): Cao, Yin
Mentor Department: Surgery

Early-onset colorectal cancer (EOCRC) has been increasing globally. Molecular agents, such as aspirin, non-steroidal anti-inflammatory drugs (NSAIDs), vitamin D, calcium, and folate have been investigated for their potential to reduce risk of CRC. We systematically reviewed RCTs randomized controlled trials (RCTs) to better understand the potential of these agents to prevent EOCRC. Aspirin and NSAIDs show the most promise against CRC, with up to 40% risk reduction. Key considerations for molecular prevention include defining target populations and strategies for effective implementation. We address barriers to implementation, such as cost, adherence, disparities in access, awareness and engagement from both the public and providers. Additionally, we highlight research gaps, particularly the underrepresentation of younger adults, racial/ethnic minorities, and geographic diversity in RCTs. Closing these gaps is crucial for advancing inclusive, targeted RCTs that will ultimately lead to translation of equitable, precision-based EOCRC prevention globally.

Poster: 32
Student Name: Alyakin, Anton
Phase/Class: Phase 3
Project Title: CNS-Obsidian: A Neurosurgical Vision-Language Model Built From Scientific Publications
Mentor(s): Oermann, Eric (NYU); Leuthardt, Eric (WashU)
Mentor Department: Neurosurgery

General-purpose vision-language models pose critical limitations for high-stakes medical decisions due to opaque training on uncurated data. We present CNS-Obsidian, a 34-billion parameter neurosurgical VLM trained exclusively on curated peer-reviewed literature to address these concerns.
We processed 23,984 articles from three neurosurgical journals, generating 263,064 training samples from 78,853 medical figures across conversations, multiple-choice questions, and differential diagnosis tasks.
On benchmark evaluation, CNS-Obsidian matched GPT-4o performance on synthetic evaluations (76.13% vs 77.54%), but achieved 46.81% accuracy on human-generated questions versus GPT-4o's 65.70%. In a blinded clinical trial at NYU Langone Health, neurosurgeons used either CNS-Obsidian or GPT-4o as diagnostic co-pilots. Models achieved similar diagnostic accuracy (~60%), with CNS-Obsidian having higher diagnosis rates per item (16.88% vs 10.69%).
Domain-specific VLMs trained on curated scientific literature can approach frontier model performance in specialized medical domains despite being orders of magnitude smaller.

Poster: 33
Student Name: Anaeme, Angela
Phase/Class: Phase 2
Project Title: Hair Loss as a Cutaneous Manifestation of Inflammatory Bowel Disease in Pediatric Populations
Mentor(s): Perlman, Meryl
Mentor Department: Pediatrics

Hair loss is an underrecognized dermatologic manifestation of inflammatory bowel disease (IBD), particularly in children. This review synthesizes current literature on hair loss in pediatric IBD, highlighting the two primary subtypes: telogen effluvium (TE) and alopecia areata (AA). While AA is more frequently documented in IBD patients and linked to immune dysregulation, TE may be more prevalent in children due to higher rates of malnutrition, systemic inflammation, and physiologic stress. However, our review revealed that the pediatric literature is sparse, and most findings are extrapolated from adult data. Medication-induced hair loss also adds complexity to this discussion, especially with early and aggressive biologic use in children. Notably, hair loss may signal disease activity, nutritional deficiency, or treatment side effects; however, there is a paucity of systematic investigation in pediatric populations. This review identifies a significant knowledge gap and calls for targeted research to better understand prevalence, mechanisms, and psychosocial impact of IBD-associated hair loss in pediatric populations.

Poster: 34
Student Name: Ashok, Ash
Phase/Class: Phase 1/Year 2
Project Title: Use of Intraoperative Frozen Section to Assess Surgical Margins in Primary Laryngeal Cancer
Mentor(s): Puram, Sid
Mentor Department: Otolaryngology

Positive margins in larynx cancer increase morbidity and adjuvant therapy needs. Intraoperative frozen section histology (IFSH) guides resections, but large-scale data in larynx are limited.
We retrospectively analyzed 118 patients (685 margins, 2017–2023). Accuracy, sensitivity, specificity, PPV, and NPV of IFSH were calculated for individual margins and overall final surgical margin status, stratified by surgery type and tumor subsite. Cox and log-rank tests assessed survival outcomes.
IFSH demonstrated 97.2% accuracy, 83.9% sensitivity, 97.9% specificity, PPV 65.0%, and NPV 99.2% for individual margins. Accuracy for final margin status was 92.4%

(NPV 98.1%). Performance didn't differ by surgery type or larynx subsite. IFSH performed better in larynx than other head and neck subsites. Of 31 re-resections, 96.8% were cleared, typically with one attempt. Re-resection wasn't associated with worse survival, though a nonsignificant trend toward increased locoregional recurrence was observed.
IFSH is highly accurate in laryngeal cancer, reliably guiding re-resection without compromising outcomes.

Poster: 35
Student Name: Baraya, Naman
Phase/Class: Phase 3
Project Title: Expert Recommendations for Neurodevelopmental Screening in Children with Craniosynostosis: A Consensus Report from the Craniosynostosis Research Neurodevelopmental Working Group (SynRG)
Mentor(s): Patel, Kamlesh
Mentor Department: Surgery

Objective: This study addresses the lack of standardized neurodevelopmental screening for children with craniosynostosis after surgery by proposing a structured assessment timeline to detect delays early.
Design: Two virtual expert consensus meetings with pediatric neuropsychologists and psychologists reviewed literature to identify tools, timelines, and strategies. Recommendations were refined by the SynRG group, including surgeons and craniofacial specialists.
Setting and Participants: The protocol targets multidisciplinary craniosynostosis clinics at tertiary centers. Participants included pediatric neuropsychologists, psychologists, neurosurgeons, and craniofacial specialists.
Interventions: The schedule spans infancy through adolescence, using the Ages and Stages Questionnaire, NIH Toolbox, and PROMIS measures, aligned with developmental milestones and academic transitions.
Main Outcome Measures: Feasibility, clinical utility, and ability to detect developmental concerns.
Results and Conclusions: The panel endorsed a staged protocol integrating caregiver input and direct assessments. SynRG feedback confirmed feasibility but noted barriers in specialist access and insurance. Implementation may improve early intervention and long-term outcomes.

Poster: 36
Student Name: Bellas, Andrew
Phase/Class: Phase 3
Project Title: Subsite Matters: Oral Cavity SCC and Tobacco-Associated Malignancies
Mentor(s): Wahle, Ben
Mentor Department: Otolaryngology

Background: In OCSCC, the floor of mouth (FOM) and retromolar trigone (RMT) have the strongest association with tobacco exposure, the lip, buccal mucosa (BM), hard palate (HP), and alveolar ridge (AR) have the weakest, and the tongue has intermediate. How this potential association with OCSCC subsite predicts secondary tobacco-associated malignancies (TAMs) has not yet been explored.
Methods: Retrospective, single-institution cohort of 805 OCSCC patients. Outcome measure was predefined secondary TAMs which were used to calculate Odds ratios (OR) with 95% confidence interval.
Results: FOM+RMT patients were younger, more male, less white, and smoked more. Patients with FOM or RMT primaries had higher odds of secondary TAMs than those with lip/BM/HP/AR (OR 2.08, 1.17–3.70). Tobacco and alcohol exposed had OR 3.50 (1.72-7.15) for developing secondary TAM compared to never-smoker-never-drinkers.
Conclusion: The risk for secondary TAM varies by OCSCC subsite and is impacted by patient profile.

Poster: 37
Student Name: Benedict, Braeden
Phase/Class: Phase 3
Project Title: Impact of GLP-1 receptor agonists on chronic low back pain in patients with obesity: a pilot study
Mentor(s): Greenberg, Jacob
Mentor Department: Neurosurgery

Introduction: In this pilot study, we assessed the effects of weight loss with glucagon-like peptide-1 receptor agonists (GLP-1 RAs) on chronic low back pain (cLBP) and studied inflammation as a possible mediator.
Methods: Patients with cLBP being prescribed GLP-1 RAs for obesity were recruited. Patients who were prescribed but never started the medication formed a control cohort. At baseline, 3-months, and 6-months, participants completed questionnaires including Brief Pain Inventory (BPI). The GLP-1 cohort also underwent a blood draw at baseline and 6-months for inflammatory marker analysis.
Results: 49 participants were enrolled, with 35 in the GLP-1 cohort and 14 in control. GLP-1 RA users showed significant decreases in BMI, pain severity, interference, and disability compared to their baseline. They also had clinically meaningful improvement compared to controls, though these differences were not statistically significant.
Conclusion: Weight loss with GLP-1 RAs may improve back pain. Inflammatory markers are currently being analyzed.

Poster: 38
Student Name: Bhat, Siddhant
Phase/Class: Phase 1/Year 2
Project Title: ACL Injury Prevention Content on TikTok: Quality and Potential for Youth Athlete Outreach
Mentor(s): Kuhn, Andrew
Mentor Department: Orthopaedic Surgery
Contributed significantly to project: Haider, Ameer; Jala, Hamza

Purpose: To assess the quality and viewership of primary anterior cruciate ligament (ACL) injury prevention content on TikTok.
Methods: TikTok was searched using ACL prevention terms. The 89 most-viewed English-language videos demonstrating preventive exercises were analyzed. Video characteristics, engagement metrics, and quality (DISCERN, PRHISM, ACLEES) were assessed independently by two authors. Interrater reliability was calculated with Cohen's κ. Linear regression, t-tests, and Fisher's exact tests were performed.
Results: Videos accrued 5,988,018 views, 569,486 likes, and 28,385 shares. Median scores were 30 (DISCERN), 13 (PRHISM), and 10 (ACLEES), indicating poor quality. Content was accessible and relevant but rarely cited evidence or follow-up information. Healthcare professionals scored higher in PRHISM authorship, authority, and disclosure, with no engagement or other score differences versus general users.
Conclusion: ACL prevention content on TikTok is widely viewed but low quality. Increased orthopedic professional presence could improve dissemination of evidence-based prevention strategies to youth athletes.

Poster: 39
Student Name: Blum, Ethan
Phase/Class: MD5
Project Title: Smartphone Based Measurement of Upper Limb Range of Motion in Brachial Plexus Injury: A Prospective Pilot Study
Mentor(s): Dy, Cristopher
Mentor Department: Orthopaedic Surgery

Accurate and accessible assessment of joint range of motion (ROM) is essential for monitoring recovery in patients with brachial plexus injury (BPI). Traditional goniometry is limited by interrater variability and in person requirements. This prospective pilot study evaluates the feasibility and reliability of ErgoArmMeter, a smartphone application that uses built in inertial sensors to measure upper limb ROM. Patients with BPI affecting the shoulder and/or elbow will perform four standardized active ROM tasks: shoulder abduction, external rotation, elbow flexion, and extension, with a smartphone affixed to the limb. Primary outcomes include feasibility (completion rate, setup time, and patient usability feedback), data completeness, and agreement between ErgoArmMeter and clinician measured goniometry. Secondary outcomes include intrarater and interrater reliability of app based measurements. This study aims to determine whether smartphone sensors can provide valid and scalable ROM assessment in patients with peripheral nerve injuries and support future integration into remote rehabilitation workflows.

Poster: 40
Student Name: Boebel, Gabriel
Phase/Class: Phase 1/Year 2
Project Title: Patient-Reported Outcomes in Diagnosis and Treatment Evaluation of Pediatric Disc Herniation Patients
Mentor(s): Montgomery, Blake
Mentor Department: Orthopaedic Surgery

Pediatric disc herniation is rare and often diagnosed late due to atypical presentations. Non-operative treatments are first-line but may fail, while discectomy offers relief at recurrence risk. This study evaluated PROMIS (Patient-Reported Outcomes Measurement Information System) Pain Interference (PI) and Mobility scores in pediatric patients compared to population norms, and outcomes by treatment. A retrospective review of 80 patients was performed. Baseline PROMIS PI and Mobility were significantly worse than norms, with surgical patients more impaired. Surgery led to greater mobility improvement, though final PI and Mobility scores were similar across groups. Pediatric disc herniation causes substantial pain and disability; patients undergoing surgery present with worse symptoms yet achieve comparable outcomes. PROMIS effectively quantifies symptom burden and response, supporting its use in pediatric disc herniation.

Poster: 41
Student Name: Bozorgmehr, Chris
Phase/Class: Phase 2
Project Title: Analysis of 5317 Consecutive Pediatric Spinal Deformity Intraoperative Neuromonitoring (IONM) Alerts: Importance of Normotension at Correction and IONM Recovery
Mentor(s): Luhmann, Scott
Mentor Department: Orthopaedic Surgery

Hypothesis: To examine the timing of intraoperative neuromonitoring (IONM) alerts in pediatric spinal deformity surgery, related corrective actions, and outcomes.
Design: Retrospective case series.
Methods: From 1992–2024, 5317 pediatric deformity surgeries were reviewed; 223 (4.2%) had ≥1 IONM alert.
Results: Alerts occurred most often during deformity correction (42%). Common responses included treating hypotension (26%), adjusting correction (18%), reducing traction (8%), altering instrumentation (8%), and decompression (6%). In hypotensive events, mean arterial pressure rose from 59 to 87 mm Hg after intervention. Postoperative neurologic change occurred in 15.2%, with most recovering fully; persistent deficits occurred in 5.8% (0.24% overall). Intraoperative data recovery was strongly associated with normal wake-up exams (p<0.001).
Conclusion: Timely corrective actions after IONM alerts substantially reduced neurologic injury risk. This largest single-center pediatric experience supports

structured IONM protocols and strengthens shared decision-making before surgery.

Poster: 42
Student Name: Bradley, McNeely
Phase/Class: Phase 3
Project Title: Time from Referral to Intervention in Patients referred for Venous Sinus Stenting Procedure for Intracranial Hypertension
Mentor(s): Stunkel, Leanne; Van Stavern, Gregory
Mentor Department: Ophthalmology & Visual Sciences
Contributed significantly to project: Katsev, Blake; Yang, Anna

When first-line medical treatment for idiopathic intracranial hypertension (IIH) fails, physicians often turn to surgical interventions. Of the surgical options, venous sinus stenting (VSS) is becoming increasingly popular due to its favorable outcomes and safety profile when compared to surgical alternatives, namely CSF shunts and optic nerve sheath fenestration. While VSS is an efficient and effective procedure, its timeliness is not well documented in the literature. Due to the complex planning involved in VSS, many factors can delay treatment and negatively impact patient outcomes. As such, we are conducting a retrospective study to analyze the time between referral for VSS and completion of the VSS procedure, as well as characterize specific factors that contribute to delays. By completing this study, we hope to help improve timeliness of the VSS procedure for future patients and optimize interim patient management.

Poster: 43
Student Name: Buchman, Ross
Phase/Class: Phase 1/Year 2
Project Title: Interventions to Reduce Financial Toxicity of Adolescent and Young Adult Cancer Survivors: A Scoping Review
Mentor(s): Housten, Ashley
Mentor Department: Surgery
Contributed significantly to project: Nnediri, Rorah

Background: Financial toxicity experienced by adolescent and young adult (AYA) cancer survivors can worsen health outcomes and have lasting negative impacts on quality of life. This scoping review will examine the effectiveness of interventions designed to alleviate financial toxicity in AYA cancer patients and the degree to which they address the National Comprehensive Cancer Network (NCCN) recommendations for delivering AYA survivorship care.
Methods: We searched seven online databases using pre-identified search strings designed in collaboration with a medical librarian. Our review included peer-reviewed studies that described interventions to address financial toxicity and their effects on AYA cancer patients.
Next Steps: Our search returned 2,724 unique results. This review will examine how interventions act at various levels of the socio-ecological model and fulfill NCCN recommendations. Future interventions targeted at addressing gaps in the NCCN recommendations will be most valuable in lessening the financial toxicity of AYA cancer survivors.

Poster: 44
Student Name: Carter, William
Phase/Class: Phase 2
Project Title: Comparison of Diabetes-Mediated Damage to Retina vs. Brain by Spatial RNA Profiling of Post-Mortem Tissue
Mentor(s): Rajagopal, Rithwick
Mentor Department: Ophthalmology & Visual Sciences

Diabetic retinopathy (DR) is associated with characteristic microvascular damage, and changes in mRNA expression of a number of genes—including CCND1 and FCGR2B—have been correlated with DR severity. While the brain and retina are both composed of nervous tissue and share a similar embryologic origin, clinically significant diabetic encephalopathy is a much less pronounced phenomenon than DR. This study aims to use RNA in situ spatial profiling to compare changes in the microvasculature and gene expression patterns between retinal and brain tissue of diabetic patients. Sections of post-mortem, FFPE retina and brain tissue from diabetic and non-diabetic control patients will be analyzed using a Xenium 5,000 gene pan-tissue panel (10x Genomics). Slices will then be PAS-stained to identify capillary basement membranes. Outcome measures include changes in the fraction of acellular capillaries, the pericyte to endothelial cell ratio, and RNA spatial expression patterns between control and diabetic tissue.

Poster: 45
Student Name: Chen, Kevin
Phase/Class: Phase 2
Project Title: Cochlear Implant Candidacy Support Tool using Conjunctive Consolidation
Mentor(s): Kallogjeri, Dorina; Matthew, Shew
Mentor Department: Otolaryngology

Despite proven benefits of a cochlear implants (CI), utilization remains low as current screening tools rely heavily on binary classification (candidate vs non-candidate), limiting individualized counseling and shared decision making. We developed a risk stratification system for CI candidacy based on routine audiometric data, enabling individualized estimates of CI candidacy likelihood. Conjunctive consolidation was used to classify patients into four audiometric severity stages, combining pure tone average and word recognition score cutoffs. Among 1,312 patients with complete data and PTA ≤100 dB, (n=782, 59.6%) met CI candidacy criteria (CNC ≤50%). Our classification system showed a clear gradient of candidacy likelihood, ranging from 2.8% in Stage 0 to 88.5% in Stage 3, with strong discriminative power (c=0.829, 95% CI: 0.806 to 0.852). This four-level classification

system offers a simple, clinically intuitive method to estimate candidacy probability, moving beyond binary screening and supporting personalized, data-driven decision making between providers and patients.

Poster: 46
Student Name: Chen, Grace
Phase/Class: Phase 3
Project Title: Outcomes and Predictors of Spinal Cord Stimulation Failure for Chronic Pain
Mentor(s): Yoshida, Mitsukuni
Mentor Department: Anesthesiology

Chronic pain affects over 600 million people globally. Spinal cord stimulation (SCS) is an established treatment, but long-term failure rates remain high, with 30–40% of patients reporting inadequate pain relief within three years. This retrospective cohort study included 229 patients who underwent SCS implantation between 2004 and 2018 to identify factors associated with device failure. Failure was defined as <50% pain reduction, device explantation, discontinuation, or replacement. Overall, 36.2% of patients experienced failure, and complications occurred in 17%. Older age at implantation was significantly associated with failure, while prior back surgery was more common in the failure group. Pain scores and narcotic use decreased post-implantation, though differences between success and failure groups were not significant. Median device survival was six years and varied by device brand and implanting surgeon. Age, device type, and surgeon were key predictors of SCS outcomes, highlighting their importance in patient selection and procedural planning.

Poster: 47
Student Name: Crook, Laura
Phase/Class: Phase 1/Year 2
Project Title: Facilitators and Barriers to Aspirin Implementation for Preeclampsia Prevention
Mentor(s): Mahmoud, Zainab
Mentor Department: Medicine

Nigeria has one of the highest maternal morbidity and mortality rates globally, with hypertensive disorders of pregnancy (HDP), including preeclampsia, being the leading cause. While aspirin can effectively prevent preeclampsia, its utilization in Nigeria remains unclear. Between August 2024 and November 2024, 18 interviews and 8 focus group discussions were conducted with healthcare workers and patients across four tertiary hospitals in Nigeria. Using the updated Consolidated Framework for Implementation Research, qualitative data were analyzed for barriers and facilitators to aspirin implementation. Identified facilitators included multidisciplinary expertise, motivation for change, high capacity for research, and alignment with current practices. Barriers included limited awareness, overburdened systems, and financial constraints. Implementation strategies highlighted education/training for patients and providers, increasing aspirin accessibility, and media campaigns promoting early antenatal care. This study identified facilitators and barriers to the implementation of aspirin prophylaxis against preeclampsia and proposed implementation strategies to increase aspirin use among appropriate patients.

Poster: 48
Student Name: Cruz, Lucas
Phase/Class: Phase 3
Project Title: NORTOC: Nasal Obstruction Randomized Trial With Oxymetazoline and Corticosteroids
Mentor(s): Farrell, Nyssa; Piccirillo, Jay; Kallogjeri, Dorina; Schwetye, Katherine
Mentor Department: Otolaryngology

Objective: Determine the effectiveness, tolerability, and safety of long-term combination oxymetazoline+budesonide nasal spray (OBNS) as compared to budesonide nasal spray (BNS) for the treatment of chronic nasal obstruction (CNO).
Methods: Single-center, double-blinded, randomized, controlled trial. Sixty participants with CNO recalcitrant to topical steroids were randomized to OBNS or BNS. The primary outcome was the rate of responders, defined as the number of participants reporting at least moderate improvement on the Clinical Global Impression-Improvement scale.
Results: The rate of responders was 47% (95% CI: 25% to 70%) higher in the OBNS group (24/29, 83%) as compared to BNS group (10/28, 36%). None of the participants in OBNS group experienced worsening of obstruction or rebound effect. All participants successfully weaned off oxymetazoline. No significant differences in mucosal inflammation or fibrosis were present between the groups.
Conclusion: Long-term oxymetazoline+budesonide can be considered for the treatment of nasal obstruction for patients failing topical steroids.

Poster: 49
Student Name: Curlin, Marcus
Phase/Class: Phase 3
Project Title: Post-operative radiation therapy in patients with early-stage Merkel cell carcinoma: analyses from an institutional cohort and national data

Merkel cell carcinoma (MCC) is an aggressive skin cancer. Postoperative radiation therapy (PORT) is used in stage I–II MCC, particularly with high-risk features: head and neck site, tumor >1 cm, immunosuppression, or lymphovascular invasion. This study characterizes early-stage patients receiving PORT and quantifies its impact on 5-year disease-specific survival (DSS) and recurrence-free survival (RFS). In the institutional cohort (IC), 108 patients diagnosed 2017–2023 were analyzed; SEER provided a national cohort (NC) of 2423 patients. PORT recipients were younger than surgery-only patients (median 70 vs. 75 IC, p=0.026; 72 vs. 77 NC). No

set
Mentor(s): Cornelius, Lynn; McEvoy, Aubriana
Mentor Department: Medicine

significant differences were seen for gender, site, or immunosuppression. DSS was higher with surgery alone (95.6% IC; 87.5% NC stage I) than PORT (73.2% IC, p=0.03; 82.8% NC). RFS also trended higher with surgery alone. PORT did not improve DSS or local control in stage I–II MCC. Further study is needed to refine selection criteria.

Poster: 50
Student Name: Daniel, Soliman
Phase/Class: Phase 2
Project Title: Factors Affecting Provider Responsiveness to Septic Shock Alerts
Mentor(s): Gerhart, Christian; Arra, Manoj; Rosenzweig, Tiffany; Ablordeppey, Enyo
Mentor Department: Emergency Medicine

Septic shock is a leading cause of hospital mortality. Early recognition and antibiotics are critical. The electronic health record (EHR) can be a powerful tool to promote prompt diagnosis, but responsiveness to EHR sepsis alerts varies. Understanding how provider experience, workload, and alert engagement affect diagnosis and treatment is essential.
We performed a retrospective chart review of 116 Emergency Department (ED) patients who triggered an EHR alert for septic shock and examined relationships among provider-level and environmental factors.
Overall, 84% of clinicians acknowledged the alert in the EHR; responsiveness declined with resident seniority (PGY-1 100% vs. PGY-4 76%). Clinicians were less likely to respond to the alert or mention sepsis in their differential diagnoses as the ED became more crowded. Diagnosis of sepsis was associated with faster antibiotic ordering.
These data suggest that both provider and environmental variables impact alert responsiveness and sepsis diagnoses in the ED, influencing antibiotic administration.

Poster: 51
Student Name: Du, Daniel
Phase/Class: Phase 2
Project Title: Relating Cartilage Source in Rhinoplasty and Patient-Reported Outcome Measures
Mentor(s): Spataro, Emily
Mentor Department: Otolaryngology

Autologous and cadaveric rib cartilage are used in septorhinoplasty when septal cartilage is insufficient, yet their comparative outcomes remain unclear. This retrospective cohort study included 584 patients (2020–2025), of whom 129 received rib grafts (33 autologous, 96 cadaver). Patient-reported outcome measures (PROMs) using the Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS), postoperative complications, and revisions were analyzed across five follow-up intervals. Cadaver graft recipients were significantly older and had more complex comorbidities. Revision rates were higher in cadaver graft patients (28.1%) compared to autologous graft patients (15.2%). Autologous graft patients reported better functional outcomes (SCHNOS-O) across time points, with a nonsignificant trend toward superior cosmetic outcomes (SCHNOS-C). Cadaver graft patients required fewer pain medications postoperatively. In summary, autologous rib grafts were associated with improved functional outcomes and fewer revisions, while cadaver grafts were more frequently used in older, medically complex patients. Future work will assess SCHNOS sub-scores and revision outcomes.

Poster: 52
Student Name: Ellis, Judson
Phase/Class: Phase 3
Project Title: Evidence for Decreased Maladaptive Guilt following PCIT-ED for Depression based on Story Stem Narratives: A Promising Method for Preschool Self-Disclosure
Mentor(s): Luby, Joan; Donohue, Rose
Mentor Department: Psychiatry

Preschool-Onset Major Depressive Disorder (PO-MDD) has been validated in children as young as 3 years old. Maladaptive guilt is a highly specific symptom of the disorder, and parenting behavior is a key risk factor. The purpose of this study is to investigate the utility of the MacArthur Story Stem Battery (MSSB), a narrative technique, as a valid and feasible tool through which depressed preschool children may express representations of their own maladaptive guilt and of their caregiver's parenting. MSSB narratives were coded for children's representations of parenting styles and of their own guilt and reparation themes before and after a dyadic therapy that focused on emotional development (PCIT-ED) empirically tested for preschool depression and compared to waitlist controls. The study found that narrative guilt themes significantly decreased in the group assigned to PCIT-ED compared to the waitlist group, and that themes of parenting styles correlated significantly with observed parenting behavior.

Poster: 53
Student Name: Fernandez, Dane
Phase/Class: Phase 1/Year 2
Project Title: Integrated analysis of

Immune checkpoint inhibition has shown promise in the treatment of head and neck squamous cell carcinoma (HNSC). Defining cell-metabolite interactions in the tumor microenvironment (TME) will allow identification of targetable metabolic pathways for reinvigorating anti-tumor immunity. A novel computational pipeline has been proposed to analyze cell-metabolite interactions within HNSC TMEs. The pipeline

spatial metabolomic and histologic imaging in head and neck squamous cell carcinoma
Mentor(s): Harbison, Richard Alex
Mentor Department: Otolaryngology

couples immunohistochemistry (IHC) with matrix-assisted laser desorption/ionization – mass spectrometry imaging (MALDI-MSI) providing spatially-resolved histology and metabolite data. MCMICRO and CyLinter were used to extract single cell data and remove corrupted artifacts from H&E stained HNSC sections. The final output was generated by a novel program which superimposes mass spectrometry and histology, quantifying stromal cell populations and relative metabolite enrichment across a tumor section. We are generating a novel tool for assessing the relationship of metabolites with tumor and stromal cell populations in a TME. Future work will assess spatial relationships between immunosuppressive metabolites and stromal HNSC TME cells.

Poster: 54
Student Name: Ferrell, Maya
Phase/Class: MSTP-Phase 1
Project Title: Recapitulation of the tumor microenvironment provides insight on the role of cholesterol biosynthesis in head and neck squamous cell carcinoma
Mentor(s): Puram, Sid; Ananya, Pal
Mentor Department: Otolaryngology

Head and neck squamous cell carcinoma (HNSCC) is the sixth leading cause of cancer related mortality, with approximately half of patients developing recurrent/metastatic disease. While traditional treatment options target tumor-intrinsic mechanisms, there is expanding interest in the tumor microenvironment (TME) -- composed of immune and non-immune stroma. Rewiring of cholesterol biosynthesis appears to promote tumorigenesis directly and indirectly through immune suppression. Using novel experimental models to recapitulate the TME, we show enhanced T-cell killing in co-cultures of HNSCC cells and patient derived CD8+ T-cells treated with 7 cholesterol inhibiting drugs. We developed an in vitro patient-derived ALI tumor organoid model which preserves native tumor stroma, epithelial, and immune cells. Flow cytometry analysis revealed successful propagation of T-cells, and testing to detect stromal and TIL sub-populations is ongoing. Critically, these results will foster studies of the HNSCC TME, which could facilitate personalized therapy testing and validation in future drug discovery pipelines.

Poster: 55
Student Name: Fogel, Adam
Phase/Class: Phase 1/Year 2
Project Title: Clinical and Biomechanical Outcomes Following Medial Patellofemoral Complex Reconstruction
Mentor(s): Knapik, Derrick; Touhey, Dan
Mentor Department: Orthopaedic Surgery

Background: Medial patellofemoral complex reconstruction (MPFCR), which combines medial patellofemoral ligament reconstruction (MPFLR) and medial quadriceps tendon femoral ligament reconstruction (MQTFLR), is an emerging surgical option for patellar instability. However, biomechanical and clinical outcomes remain unclear.
Methods: A Level IV systematic review of Level III–IV studies reporting biomechanical and/or clinical outcomes following MPFCR, with or without comparison to MPFLR and/or MQTFLR, was conducted through July 2025.
Results: Eight studies (three biomechanical, five clinical) were included, comprising 198 MPFCR patients (mean age 17.5 years; 65.7% female). Lateral patellar displacement improved similarly across techniques. MPFCR demonstrated a 90.0% return to sport (RTS) rate, with 90.9% returning to prior level. Tegner, Lysholm, IKDC, and Kujala scores improved. Complications occurred in 16.2%, primarily due to failure (7.1%), with reoperations in 1.5%.
Conclusions: MPFCR provides favorable biomechanical and clinical outcomes with high RTS. Further research is needed to clarify indications and long-term efficacy.

Poster: 56
Student Name: Forst, Oliver
Phase/Class: Phase 2
Project Title: The Importance of External Rotation Following Reverse Total Shoulder Arthroplasty is Dependent Upon Arm Position
Mentor(s): Devana, Sai; Zimistowski, Benjamin
Mentor Department: Orthopaedic Surgery

The impact of external rotation in reverse total shoulder arthroplasty (rTSA) outcomes remains unclear. This study evaluated the effect of external rotation at the side (ERADD) and in abduction (ERABD) on patient-reported outcomes.
We retrospectively analyzed 396 rTSA patients (mean age 69, 57% female) from an institutional registry with ≥2-year follow-up. Range of motion and patient-reported outcomes were collected. The patient acceptable symptom state (PASS) was defined as a single assessment numeric evaluation (SANE) score >75.
At two years, 54% achieved PASS. In patients with forward elevation and abduction ≥135° (n=244), ERABD showed a stronger association with PASS (Goodman and Kruskal's Gamma=0.40) than ERADD (Gamma=0.32). In multivariate analysis, ERABD (p=0.02), internal rotation (p<0.001), pain (p<0.001), and smoking (p=0.05) independently predicted PASS. ERABD correlated most with overhead activities such as combing hair.
ERABD is more strongly linked to functional outcomes than ERADD, underscoring its importance in optimizing rTSA.

Poster: 57
Student Name: Francisco, Narro Garcia
Phase/Class: Phase 2
Project Title: Underutilization of Bone Health Interventions After Femur Fracture in Children with Cerebral Palsy
Mentor(s): Hosseinzadeh, Pooya
Mentor Department: Orthopaedic Surgery

Children with CP are at an elevated risk for fragility femur fractures, which are especially common in nonambulatory children and those with poor muscular control due to decreased bone density and uncontrolled movement. Prior studies concluded DXA screening, bisphosphonates, and calcium supplements were appropriate interventions to identify those at risk and prevent re-fractures. Of 1000 CP patients with an index femur fracture in our study, 11.4% underwent DEXA scan and 5.4% were prescribed osteoporotic medications within a year of index fracture. 18.9% suffered a femur re-fracture, 7.1 a tibia or fibula fracture within a year. The underuse of bone health evaluation is the leading cause of secondary fractures. Given the substantial morbidity associated with femur fractures – including pressure ulcers, immobility, and muscle contractures – these findings underscore the critical gap between evidence-based recommendation and practice.

Poster: 58
Student Name: Fulkerson, Abigail
Phase/Class: Phase 3
Project Title: Cardiac Radiotherapy-Induced Epigenetic Memory Underlies Electrophysiologic Reprogramming
Mentor(s): Rentschler, Stacey
Mentor Department: Medicine

Background: Cardiac radiotherapy is emerging as a highly effective treatment for ventricular tachycardia. Growing evidence suggests that radiation favorably reprograms the electrical substrate by modulating ion channel expression, but the mechanisms remain incompletely understood. We hypothesized that radiation mediates electrophysiologic reprogramming by inducing persistent alterations in the cardiomyocyte epigenetic landscape. Methods: RNA sequencing, ATAC sequencing, and CUT&Tag were performed in irradiated versus sham-treated mouse hearts and stem cell-derived cardiomyocytes. Engineered heart tissues (EHTs) were then used to assess electrophysiologic endpoints corresponding with observed transcriptomic and epigenetic changes. Results: A single fraction of 25 Gy radiation led to persistent changes in the cardiomyocyte epigenome and transcriptome both in vivo and in vitro. These changes were mirrored by dynamic and dose-dependent changes in EHT electrophysiology. Conclusions: Our findings suggest that radiation leads to persistent changes in the cardiomyocyte epigenetic landscape and that these changes contribute to electrophysiologic reprogramming.

Poster: 59
Student Name: Galla, JT
Phase/Class: Phase 1/Year 2
Project Title: Growth-Friendly vs. Posterior Spinal Fusion Surgery for Congenital Kyphosis: A Multicenter Analysis of Complications, Reoperations, and Patient Outcomes
Mentor(s): Luhmann, Scott
Mentor Department: Orthopaedic Surgery

Congenital Kyphosis (CK) is a spinal deformity often requiring early surgery to prevent neurological and pulmonary decline. This study compared outcomes between growth-friendly (GF) techniques and posterior spinal fusion (PSF) in children under 10 using an international, multicenter database with ≥ 2 years follow-up.
54 patients (27 PSF; 27 GF) were analyzed. Preoperative sagittal and coronal deformity was similar. Both groups achieved similar sagittal deformity correction postoperatively and at final follow-up. PSF showed superior postoperative coronal deformity correction (p=0.0343) but was similar at final follow-up. T1-S1 length increased at a similar rate between groups. The GF group experienced significantly more complications (p=0.0048) and unplanned reoperations (p=0.0470). Patient-reported general health improved more for PSF (p=0.0336), with all other domains being similar.
PSF had similar or better radiographic and functional outcomes than GF surgery with fewer complications and reoperations. Although GF surgery aims to preserve spinal growth, T1-S1 change overtime was similar.

Poster: 60
Student Name: Garneni, Mansi
Phase/Class: Phase 2
Project Title: Persistent and De Novo Postpartum Hypertension: A Scoping Review of Pathophysiology, Evaluation, and Management
Mentor(s): Mahmoud, Zainab
Mentor Department: Medicine

Postpartum hypertension, defined as elevated blood pressure (≥140 mmHg systolic or ≥90 diastolic) after delivery, may be persistent—following chronic, gestational, or preeclampsia-related hypertension—or de novo. The postpartum period is marked by profound physiologic change: blood pressure can fluctuate substantially, placing patients at risk for severe hypertension, stroke, and heart failure. We performed a scoping review to synthesize knowledge on postpartum hypertension. Eligible studies focused on persistent or de novo hypertension up to 12 months postpartum. 2,115 studies were screened from MEDLINE, Embase, and Scopus, and 128 were included. Evidence was reviewed on epidemiology, risk factors, evaluation, and management. Results show a lack of global epidemiologic data, standardized definitions, and unclear treatment guidelines. Distinct risk factors suggest persistent and de novo postpartum hypertension may have different etiologies. No antihypertensive has emerged as first-line; management should be individualized. Remote blood pressure monitoring and telehealth offer promising strategies to

expand care.

Oral Presenter
Student Name: Gaudian, Kelly
Phase/Class: Phase 1/Year 2
Project Title: Association of NRF2 Pathway Activation with Radiation Resistance in Larynx Cancer
Mentor(s): Zolkind, Paul; Kallogjeri, Dorina; Piccirillo, Jay
Mentor Department: Otolaryngology

Patients with advanced laryngeal cancer (LCa) face poor outcomes, but current clinical guidelines lack predictive biomarkers. Preclinical studies link NRF2, a transcription factor driving antioxidant response, to radiation therapy (RT) resistance. This study examines whether NRF2 activation predicts RT response in LCa patients. A cohort of 135 LCa patients treated at Siteman with surgery and RT or surgery alone underwent RNA-sequencing-based gene expression profiling to derive an NRF2 score. Disease-free survival (DFS) and locoregional failure (LRF) rates were compared using Kaplan-Meier analysis.
Among patients receiving surgery and RT, NRF2-high patients had significantly worse outcomes than NRF2-low, with 5-year LRF rates of 58.7% and 11.0%, and 5-year DFS rates of 15.9% and 57.6% respectively. In surgery-alone patients, NRF2 was not prognostic.
These findings suggest NRF2 activation is associated with worse outcomes in patients receiving radiation. Future implications include validating NRF2 as a biomarker and the development of NRF2-targeted therapies.

Poster: 61
Student Name: Gaziano, Dominic
Phase/Class: Phase 1/Year 2
Project Title: What are the predictors for changes in pain one year after surgery for adult traumatic brachial plexus injury?
Mentor(s): Dy, Christopher
Mentor Department: Orthopaedic Surgery

Evaluation of pain after brachial plexus injuries (BPI) has been studied in recent years, but little is known regarding factors that may predict changes in pain after BPI reconstruction. We analyzed data from a multicenter prospective cohort of patients (n = 76) undergoing surgery for BPIs. The primary outcome was change in the pain subscale of the Impact of BPI questionnaire, a validated BPI-specific measure. Pain significantly decreased one year after surgery for patients with upper trunk injuries (p < 0.02) and pan-plexus injuries (p < 0.02), but did not significantly change for those with lower trunk injuries. Patients with combined pre- and post-ganglionic (p < 0.01) and post-ganglionic injury (p < 0.02) had significant reductions in pain one year after surgery, while there was no change in those with pre-ganglionic avulsions. Our findings can guide patient and surgeon expectations of pain after BPI based on injury characteristics.

Poster: 62
Student Name: Gebreegziabher, Yodahe
Phase/Class: Phase 2
Project Title: DRAUP that X-Ray: Ultrasound-Only CVC Confirmation in the ED
Mentor(s): Ablordeppey, Enyo
Mentor Department: Emergency Medicine
Contributed significantly to project: Ugochukwu, Nnediri

Ultrasound-guided central venous catheter (UGCVC) confirmation demonstrates comparable sensitivity and safety to traditional chest radiography (CXR), yet routine CXR remains common in U.S. practice.
This study evaluates outcomes from a De-implementation of Routine CXR after Adoption of UGCVC insertion and confirmation Protocol (DRAUP) in the Barnes-Jewish Hospital Emergency Department (ED) from 2020–2025.
A retrospective chart review of over 400 CVCs confirmed using DRAUP revealed sustained and increasing utilization over time. The right internal jugular vein was the most frequent site. Over 90% of lines remained in place after ICU admission and >95% had no complications. The most common reason for protocol deviation (“DRAUP-out”) was difficulty visualizing one of the three required ultrasound views.
DRAUP implementation has led to a sustained reduction in routine CXR use following CVC placement. Ongoing efforts are directed at expanding DRAUP into ICUs and additional EDs to promote safer, more efficient vascular access confirmation practices.

Poster: 63
Student Name: Geissbuhler, Annabel
Phase/Class: Phase 2
Project Title: Impact of Socioeconomic Status on Demographics and Post-surgical Outcomes of Patients with Periprosthetic Femur Fractures
Mentor(s): Obey, Mitch
Mentor Department: Orthopaedic Surgery

Introduction: Although socioeconomic status (SES) has been found to impact outcomes after a variety of orthopedic procedures, there is currently no literature on the impact of SES on outcomes after surgical treatment of periprosthetic femur fractures.
Methods: All periprosthetic femur fractures treated surgically at WashU between 7/1/2017 and 8/1/2024 were included. Patient SES, demographics, and outcomes of interest were collected via chart review.
Results: The most socioeconomically disadvantaged patients were more likely to be Black (p=0.040) and have an increased ASA status (p=0.006), and less likely to be taking osteoporosis medications/supplements (p=0.018) at the time of surgery. There were no differences in reoperation rate, hospital readmission, or mortality between ADI quartiles.

Discussion/conclusion: Although SES did not directly impact outcomes after surgical treatment of periprosthetic femur fractures, our findings suggest a gap in care for osteoporosis/osteopenia at the time of periprosthetic femur fracture.

Poster: 64
Student Name: Goldfarb, Jake
Phase/Class: Phase 2
Project Title: Crankshaft Phenomenon After Definitive Spine Fusion in Pre-Teens: Should We Be Concerned with Pedicle Screw Constructs?
Mentor(s): Montgomery, Blake
Mentor Department: Orthopaedic Surgery

Background: Early spinal fusion may lead to the crankshaft phenomenon, occurring when continued growth of the anterior spine causes increased rotation and curve progression.
Methods: A retrospective analysis was conducted of idiopathic scoliosis patients aged ≤12 treated with posterior spinal fusion. Crankshaft was defined as a ≥ 10° change in thoracic angle or a ≥ 20° change in rib vertebral angle difference (RVAD).
Results:
132 patients were included (70% Risser 0). The thoracic curve and RVAD both significantly increased from first to final follow-up (p < 0.01), with 8 patients experiencing the crankshaft phenomenon under the thoracic criteria and 11 under the RVAD criteria. There was no significant association between RVAD and self-image as measured by PROMIS peer relations. 95.9% of the screws in the cohort reached the anterior 50% of the vertebral body.
Conclusions: Patients undergoing early spinal fusion may exhibit the crankshaft phenomenon, but the rates are low.

Poster: 65
Student Name: Goli, Pavithr
Phase/Class: Phase 1/Year 2
Project Title: A Systematic Review of Operative Management and Outcomes for Tibial Plateau Osteochondral Lesions
Mentor(s): Knapik, Derrick
Mentor Department: Orthopaedic Surgery

Objective: Tibial plateau osteochondral (TP-OC) lesions pose treatment challenges due to limited outcome data. This systematic review evaluates operative indications, techniques, and outcomes.
Methods: Databases (Cochrane, EMBASE, PubMed) were searched for studies on TP-OC lesion management, reporting techniques, etiology, lesion characteristics, and outcomes.
Results: Among 24 studies (581 patients, mean age 42.2), traumatic injury was most common (82.6%). Lateral plateau lesions (65.8%) averaged 2.29 cm^2. Treatments included osteochondral allograft (OCA, 80.2%), microfracture (6.7%), and autografts (6.4%). Meniscal allograft transplantation (MAT) was frequent (54.0%). Graft failure occurred in 26% of cases (30.1% OCA). PROs improved (IKDC: 39.5→66.2; Lysholm: 62.1→91.7; Tegner: 3.6→5.9).
Conclusions: TP-OC lesions often result from trauma, primarily affecting the lateral plateau. OCA was the most used treatment, with MAT commonly performed concurrently. Despite PRO improvements, graft failure remains a concern (26% OCA). Further research is needed to optimize repair vs. restoration strategies and long-term outcomes.

Poster: 66
Student Name: Gomes, Isabella
Phase/Class: MD5
Project Title: Clinical Characteristics and Visual Outcomes in Patients with Ocular Syphilis at a Tertiary Care Center
Mentor(s): Walsh, James; Montana, Cynthia
Mentor Department: Ophthalmology & Visual Sciences
Contributed significantly to project: Carter, William

Purpose: To examine clinical characteristics, diagnostics, treatment, and visual outcomes in ocular syphilis patients over two decades.
Methods: Retrospective analysis of patients diagnosed with ocular syphilis at Barnes Jewish Hospital (2003–2024). Baseline features, diagnostic results, treatments, complications, and visual acuity were assessed.
Results: Thirty-eight patients were identified, all with bilateral ocular involvement. Presentations included anterior, intermediate, and posterior uveitis, optic neuritis, and neuroretinitis. Serology was universally positive (RPR 92%, treponemal 100%, both 92%). OCT revealed photoreceptor disorganization (65%) and retinal edema (55%). Fluorescein angiography showed diffuse vascular leakage with early blockage and late staining. All patients received intravenous penicillin G, achieving a four-fold RPR decline within three months. Despite antibiotic response, 30% developed persistent inflammation requiring immunomodulatory therapy (mycophenolate, methotrexate, or adalimumab).
Conclusion: Ocular syphilis responds serologically to penicillin, but patients—especially with posterior uveitis—often require adjunctive immunomodulatory treatment for residual inflammation.

Poster: 67
Student Name: Haider, Ameer
Phase/Class: Phase 3

This systematic review and meta-analysis investigated predictive factors for change in patient reported outcome measure and non-failure reoperations (failure defined as conversion to arthroplasty, total/subtotal meniscectomy, or revision MAT) after meniscal allograft transplantation (MAT). A total of 154 studies involving 11,413

Project Title: Predictive Factors for Change in Patient-Reported Outcome Measure and Non-Failure Reoperations After Meniscus Allograft Transplantation: A Systematic Review and Meta-Analysis
Mentor(s): Matava, Matthew
Mentor Department: Orthopaedic Surgery

patients and 11,548 transplanted menisci were included. The pooled improvement in Lysholm score (ΔLysholm) was 24.2, while the incidence of reoperations was 3.36%. No predictive factors were significantly associated with ΔLysholm in meta-analysis, but multivariable regression revealed that older age and shorter time from meniscectomy to MAT predicted smaller improvements. Lateral MAT carried greater risk of reoperation compared with medial MAT, while longer injury-to-MAT intervals and bone-bridge fixation for medial MAT (vs. bone-plug fixation) also increased reoperation risk. These findings suggest that age, timing of surgery, graft fixation technique, and graft laterality may influence MAT outcomes and can guide prognosis, shared decision-making, and surgical planning to optimize MAT outcomes.

Poster: 68
Student Name: Halpert, McKenzie
Phase/Class: Phase 1/Year 2
Project Title: Pseudoaneurysms in Necrotizing Pancreatitis: Is transmural drainage associated with hemorrhage?
Mentor(s): Trieu, Judy
Mentor Department: Medicine

Objective: To determine whether pseudoaneurysms increase bleeding incidence in necrotizing pancreatitis patients undergoing transmural drainage and whether pre-drainage embolization improves outcomes.
Background/Significance: Necrotizing pancreatitis is a severe form of acute pancreatitis and is complicated by the presence of pseudoaneurysms in about 4% of cases. While transmural drainage is a widely used intervention for necrotizing pancreatitis, it remains unclear whether the presence of pseudoaneurysms increase the risk of post-procedural bleeding. Additionally, the potential benefits of pre-drainage endovascular embolization on bleeding incidence and mortality rates have not been well established.
Methods: This retrospective review includes adult patients with necrotizing pancreatitis who underwent transmural drainage between March 1, 2016 and June 30, 2025. Patients were identified using keyword searches in electronic health records and PACS database imaging. Bleeding incidence and mortality rates were then compared between patients with and without pseudoaneurysms, as well as between those who did and did not undergo embolization.

Poster: 69
Student Name: Hanson, Jorin
Phase/Class: Phase 1/Year 2
Project Title: Perioperative Mental Health Interventions and Post-Operative Delirium in Oncologic and Orthopedic Surgery Patients
Mentor(s): Holzer, Katherine
Mentor Department: Anesthesiology

Background: Post-operative delirium (POD) is a common and serious complication in older surgical patients, particularly those with pre-existing anxiety and depression.
Methods: In this sub-study of a randomized clinical trial (NCT05685511; NCT05697835), we examined the effect of a perioperative mental health intervention on POD incidence in older adults undergoing orthopedic and oncologic surgery. The intervention group (n=102) received medication optimization and behavioral activation-based therapy; the enhanced usual care group (n=102) received educational pamphlets.
Results: Eight patients (4%) developed POD, with a higher incidence in the usual care group (63%; n=5) than the intervention group (37%; n=3). POD occurred more often in females, older patients, and those undergoing abdominal surgery.
Conclusion: A perioperative mental health intervention combining medication optimization and behavioral activation may reduce POD in older surgical patients, though current evidence remains inconclusive. These findings support further investigation of mental health-focused care to improve post-surgical outcomes.

Poster: 70
Student Name: Hernandez Rovira, Miguel
Phase/Class: Phase 3
Project Title: Plasma cell-free DNA fragmentation as a non-invasive biomarker of preoperative risk-stratification in meningiomas
Mentor(s): Mathios, Dimitrios
Mentor Department: Neurosurgery

Introduction: Monitoring response to treatment, recurrence, and disease evolution of meningiomas, which represent over 35% of adult intracranial tumors, often necessitates surgical resection for a direct tissue sample. We describe a liquid biopsy tool capable of identifying features of aggressive meningiomas.
Methods: Cell-free DNA (cfDNA) from meningioma and non-cancer neurological control (NCNC) patients was extracted and subjected to shallow whole-genome sequencing. We generated a score ranging from 0-1 using an established cfDNA fragmentation machine learning model called ARTEMIS (Analysis of RepeaT EleMents in dISease)-DELFI (DNA EvaLuation of Fragments for early Interception), with higher values indicating more aggressive behavior. Relationships between ARTEMIS-DELFI scores, tumor Ki-67%, lesion size and mitoses were assessed via linear regression, whereas tumor grade, location, proximity to major blood vessels, hypercellularity and nuclear atypia were assessed via the Kruskal-Wallis test.
Results: Exactly 67 meningiomas (35 WHO grade 1, 30 WHO grade 2 and 2 WHO grade 3) and 58 NCNCs were analyzed prospectively. Positive correlations between

Ki-67% and ARTEMIS-DELFI scores were found for grade 1 (r=0.1308, p=0.4610) and 2 (r=0.3469, p=0.0603) meningiomas (r=0.1308, p=0.4610). Correlation between scores and mitoses was positive for grade 2 (r=0.1231, p=0.5169) and negative for grade 1 (r=-0.2966, p=0.0836) meningiomas. Scores for grade 2 skull base meningiomas were increased as compared to the convexity (median=0.5765 vs 0.1205, p=0.0443). Nuclear atypia (median = 0.8000 vs 0.2340, p = 0.3568) and venous sinus proximity (median=0.5527 vs 0.2729, p=0.3483) were associated with higher scores in grade 2 meningiomas.
Conclusion: Preliminary analyses indicate that cfDNA fragmentation is a promising non-invasive preoperative biomarker of tumor aggressiveness with the potential to guide treatment decisions including extent of resection. A larger cohort is required to reach robust statistical conclusions.

Poster: 71
Student Name: Hollander, Sean
Phase/Class: Phase 1/Year 2
Project Title: Corneal Culture Technique: Quality Improvement Educational Intervention
Mentor(s): Margolis, Todd
Mentor Department: Ophthalmology & Visual Sciences
Contributed significantly to project: Zenebe-Gete, Selam

This quality improvement study evaluates whether a standardized educational intervention improves corneal culture positivity rates among ophthalmology trainees at Washington University in St. Louis. A retrospective review showed a baseline positivity rate of 18.5%, significantly below published benchmarks (~30%), raising concern for suboptimal technique in corneal swabbing. To address this, all residents will participate in an in-person session featuring didactics, instructional videos, a wet lab, and written tips. This study is IRB-approved, the training session is scheduled, and data collection is ongoing. Prospective corneal culture cases will be analyzed alongside approximately 200 retrospective cases. This study will compare pre- and post-intervention positivity rates and assess changes in self-reported confidence using surveys. The intervention is expected to increase positivity rates and improve trainee confidence, ultimately enhancing diagnostic accuracy in infectious keratitis. This initiative provides a scalable framework for standardizing procedural training and reducing false negatives.

Poster: 72
Student Name: Ince, Jon
Phase/Class: Phase 3
Project Title: The Femoral Head Edema Zone: A Novel Classification Scheme to Better Predict Osteonecrosis Progression
Mentor(s): Pascual-Garrido, Cecilia
Mentor Department: Orthopaedic Surgery

Background: This study proposed a new classification, the Edema Zone classification, that uses MRI to grade the extent of edema in osteonecrosis of the femoral head (ONFH).
Methods: This was a retrospective study of hips that converted to THA from a core decompression within 26 months compared to hips that received only core decompression. Hips were graded by Edema Zone and JIC classifications and then compared.
Results: Inter-rater reliability for Edema Zone classification was high (κ=0.87). Edema Zone grades demonstrated a significant P-value for trend (P < 0.001) and were higher in hips that converted to THA. Receiver Operating Characteristic Area Under Curve for the Edema Zone classification was 0.71, substantially greater than the JIC classification system at 0.52.
Conclusion: Edema Zone classification was a more accurate predictor of THA conversion compared to the JIC classification and can be a powerful tool in guiding appropriate surgical intervention for ONFH patients.

Poster: 73
Student Name: Jalal, Hamza
Phase/Class: Phase 2
Project Title: Association of Socioeconomic Status and Adverse Events in Patients with Left Ventricular Assist Devices: A Dual Institutional Study
Mentor(s): Vader, Justin
Mentor Department: Medicine

Left ventricular assist devices (LVADs) improve survival in advanced heart failure, but the influence of socioeconomic status (SES) on post-implant outcomes remains uncertain. We aimed to determine the association between SES and adverse events in LVAD recipients. We conducted a dual-center retrospective study of LVAD patients at WashU and MGH. SES was assessed using the Distressed Communities Index (DCI). Baseline demographics, pre-implant variables, and post-implant adverse outcomes were analyzed. Among 377 patients, demographic differences across DCI groups included greater representation of women and Black patients in distressed communities. Overall adverse event rates did not differ significantly across DCI groups, except for a higher incidence of DLI in distressed patients. DCI was not a predictor of mortality or adverse events. This is the first study to evaluate DCI in relation to major adverse events post-LVAD. SES did not independently predict outcomes, underscoring the need to avoid SES-based bias in candidacy decisions.

Poster: 74
Student Name: Jannath, Syeda
Phase/Class: Phase 1/Year 2
Project Title: Imaging Surveillance Versus Surgical Excision for High- and Low-risk Breast Lesions
Mentor(s): Brodsky, Jennie
Mentor Department: Radiology

Recommendations for managing post-biopsy benign breast lesions vary depending on pathology and risk of upgrade to malignancy. Historically, surgical excision was preferred for all high-risk lesions; however, management guidelines now consider imaging and pathological features, such as atypia, to guide optimal clinical management and reduce unnecessary intervention. This study aims to evaluate outcomes of high- and low-risk lesions managed with either surveillance or excision, and to assess the safety of follow-up imaging as an alternative for low-risk lesions. A retrospective review of radiology and pathology records was performed at BJH/WUSM for all breast biopsies between 2020 and 2025. Lesions were categorized as papillomas, radial scars, complex sclerosing lesions, atypical lobular hyperplasia, focal epithelial atypia, and lobular carcinoma in situ. Clinical, imaging, and pathological results were collected and data will be analyzed using univariate and multivariate logistic regression. Findings are anticipated to inform institutional management strategy changes for breast lesions.

Poster: 75
Student Name: Johansson, Kimberly
Phase/Class: MSTP Phase 2 / Phase 3
Project Title: Ivosidenib Leads to Durable Responses in IDH1 Mutated Clonal Cytopenias of Undetermined Significance: A Phase II Decentralized Clinical Trial
Mentor(s): Bolton, Kelly
Mentor Department: Medicine

Patients with both cytopenia and evidence of clonal hematopoiesis have an entity termed Clonal Cytopenia of Undetermined Significance (CCUS), and frequently develop myeloid neoplasms. We conducted a decentralized Phase II single-arm study to characterize the safety and efficacy of the oral IDH1 inhibitor ivosidenib in IDH1-mutant CCUS for cancer prevention (NCT05030441).
Overall, 82% (14/17) of patients achieved a hematologic response of at least 8 weeks in duration, with 86% of responders having a continued response at one year. Two patients progressed to myelodysplastic syndrome. Adverse events of grade ≥3 occurred in five patients (26%), including two with grade ≥3 treatment-related events of rash and pancytopenia with sepsis.
This study demonstrates that decentralized clinical trials are an effective solution for the study of rare hematologic neoplasms, improving accessibility and feasibility. Ivosidenib was well-tolerated, and induced durable hematologic remissions with mutation clearance suggesting modification of the expected natural course of CCUS.

Poster: 76
Student Name: John, Sofia
Phase/Class: Phase 1/Year 2
Project Title: Impact of Surgical Volume and Subspecialty Rotation Order on Fellowship Application Amongst Ophthalmology Residents
Mentor(s): Sieck, Erin
Mentor Department: Ophthalmology & Visual Sciences

Fellowship application decisions in ophthalmology are shaped by multiple factors, yet the influence of surgical volume and subspecialty rotation order has not been studied. Evidence from other specialties suggests that both procedural exposure and the timing of rotations can affect career trajectories, with earlier exposure linked to higher fellowship pursuit. This retrospective cohort study will review case logs and rotation schedules of Washington University in St. Louis ophthalmology residents graduating between 2015–2025 to assess whether early subspecialty rotations and higher surgical case volumes are associated with fellowship selection. Rotations will be categorized as “early” (first three) or “late” (last three), and statistical analyses will include Chi-Square tests, t-tests, ANOVA, and descriptive summaries. While single-institution sample size may limit power, we anticipate identifying trends that highlight the role of educational experiences in shaping fellowship decisions, ultimately informing curriculum design and career advising in ophthalmology training.

Poster: 77
Student Name: Kinkade, Sydney
Phase/Class: Phase 1/Year 2
Project Title: Diagnostic Accuracy of Axillary Ultrasound in SOUND Trial-Eligible Breast Cancer Patients: A Single-Center Study
Mentor(s): Margenthaler, Julie
Mentor Department: Surgery

Accurate axillary staging remains critical in early-stage breast cancer, yet sentinel lymph node biopsy (SLNB) carries risks that may be avoidable in select patients. The SOUND trial demonstrated that SLNB can be safely omitted in women over the age of 50 who have clinically node-negative axillas and negative axillary ultrasounds (AUS). This retrospective study evaluates the diagnostic accuracy of AUS in SOUND-eligible patients treated at WashU. We aim to determine the sensitivity, specificity, and predictive values of AUS relative to final nodal pathology, and to assess whether AUS findings predict nodal metastasis. We anticipate high specificity and negative predictive value but limited sensitivity, consistent with prior data. By validating the performance of AUS in a real-world academic setting, this study has the potential to shift institutional practice, reduce overtreatment, and accelerate adoption of noninvasive, personalized approaches to axillary staging—ultimately improving outcomes and quality of life for patients with early breast cancer.

Poster: 78
Student Name: Lazarus, Michael
Phase/Class: Phase 2
Project Title: Risk Factors for Delusions of Parasitosis and Utility of Diagnostic Testing
Mentor(s): Cole, Emily
Mentor Department: Medicine

Delusions of parasitosis (DOP) is a psychocutaneous disorder characterized by a fixed, false belief of skin infestation. Many patients seek dermatologic evaluation and reject psychiatric care, with resulting high rates of loss to follow-up and limited engagement in appropriate care. Some clinicians perform skin biopsies to build rapport, though the utility of this approach is uncertain. This retrospective study will review electronic health records of adults diagnosed with DOP between 2010 and 2025 to assess whether undergoing a skin biopsy is associated with improved healthcare utilization metrics, including attendance at follow-up appointments, psychiatric referral acceptance, and treatment initiation. Data collected will include demographics, comorbidities, and clinical and histopathological findings. A matched control group of patients with prurigo nodularis, a clinically similar but non-delusional skin condition, will be used for comparison. Findings from this study are expected to inform clinical strategies to improve engagement and care delivery for patients with DOP.

Poster: 79
Student Name: Leonard, Nicholas
Phase/Class: MD5
Project Title: Empowering Emergency Physicians: A Mastery Learning Checklist to Drive Adoption of Ultrasound-Guided Subclavian Vein Cannulation
Mentor(s): Ablordeppey, Enyo
Mentor Department: Otolaryngology

Emergency Medicine Physicians (EMPs) underutilize Ultrasound-Guided Subclavian Vein Cannulation (UGSVc) despite its clinical advantages, largely due to limited training, procedural discomfort, and absence of standardized education.
A mixed-methods needs assessment from surveys (qualitative, n=41 and quantitative, n=117), and interviews/focus groups (n=12) revealed significant gaps in EMP confidence, capability, and comfort with UGSVc. In response, we developed a Mastery Learning Checklist, a structured tool aimed at promoting procedural skill through deliberate practice, real-time feedback, and rigorous assessment.
An expert panel of five EMPs with central line expertise created the initial draft. Through a three-round modified Delphi process involving 16 experts, the checklist was refined to 36 items, including 5 critical failure points.
This is the first standardized checklist specific to UGSVc. It serves as a foundation for an educational implementation strategy to improve adoption through enhanced proficiency and motivation. Next steps include checklist validation and integration into formal EMP training curricula.

Poster: 80
Student Name: Lewis, Ethan
Phase/Class: Phase 2
Project Title: Orticochea Local Flap for Reconstruction of Large Scalp Defects: Outcomes and Technique
Mentor(s): Rich, Jason
Mentor Department: Otolaryngology

The Orticochea flap is a local three-flap technique that can be used for the reconstruction of large frontal or occipital scalp defects. This technique is a viable and underutilized alternative to free tissue transfer and can be particularly useful in frail patients or in patients who desire a more aesthetically pleasing scalp reconstruction. To date there are no published surgical outcomes of the Orticochea flap. Herein, we describe the surgical technique and present the first ever series of in-depth surgical outcomes for the Orticochea flap. Six patients treated at Washington University in St. Louis between 2020 and 2024 were analyzed. Recipients of the Orticochea flap experienced shorter operative times and shorter post-operative hospital stays compared to free flaps with very few complications, highlighting the Orticochea flap's reliability and overall benefits.

Poster: 81
Student Name: Li, Mark
Phase/Class: Phase 1/Year 2
Project Title: VISTA as an Immune Checkpoint Molecule in AML
Mentor(s): Ley, Timothy; Yin, Tiankai
Mentor Department: Radiation Oncology
Contributed significantly to project: Yin, Tiankai

Immune escape is a well-described mechanism of cancer progression in solid tumors. However, its mechanism in acute myeloid leukemia (AML) is relatively unknown, hindering development of related therapeutic strategies.
The lab has linked immune escape with AML pathogenesis in a mouse model carrying Dnmt3a and Npm1 mutations, the most common initiating mutations in AML, from observing exhausted T cells in immunocompetent mouse models with these mutations. According to the TCGA AML RNA-seq dataset, Vsir overexpression (encoding VISTA, a known T cell immune checkpoint molecule) is associated with AML initiated by these mutations. The lab has supported this, showing CRISPR/Cas9-mediated Vsir inactivation in vitro reduced immunosuppression of these AMLs.
Current studies aim to determine whether Vsir inactivation of transplanted AML cells will increase leukemia-free survival and whether overexpression of Vsir in preleukemic progenitor cells will accelerate AML development in immunocompetent mice, seeking to illuminate VISTA as a therapeutic target.

Poster: 82
Student Name: Litrel, Joseph
Phase/Class: Phase 3
Project Title: Variability and Educational Gaps in Public Information Resources on Myelomeningocele: An Analysis of Web-Based Resources and AI-Powered Large Language Model Responses
Mentor(s): Santucci, Nicole; Vrecenak, Jesse
Mentor Department: Surgery

Myelomeningocele(MMC) is a congenital diagnosis that requires multidisciplinary care for best treatment, with fetal and postnatal repair representing standard of care options. We sought to analyze the availability and content of public resources about MMC. A series of 18 queries were searched in Google to develop a list of resources. Three lists of questions were used to elicit responses from “AIs”(ChatGPT, Copilot, Gemini). Our coding scheme had 49 items across 4 categories; basic information, complications, treatment, support systems. Two coders rated the resources after establishing interrater reliability. All sources were graded on readability using Flesch-Kincaid and SMOG calculators. Results show great disparity in the quality of resources (Range 1,37; Med.=24) and inadequacies(73% lack information on ongoing damage during pregnancy). AI responses were more comprehensive(Med.=35). Readability analysis showed no association between reading level and coding score. Resources are significantly above the recommended 6-7th grade reading level with AI significantly above websites.

Poster: 83
Student Name: Long, Katherine
Phase/Class: Phase 2
Project Title: Rapid single-sequence brain MR imaging in pediatric patients using a radial VIBE MRI sequence: A Pilot Study
Mentor(s): Patel, Kamlesh
Mentor Department: Surgery

Introduction: A single short scan that provides cranial and intracranial details without radiation exposure is needed. Here, we compare a 5-minute golden-angle (GA) 3D stack-of-stars radial volumetric interpolated breath-hold examination (VIBE) MRI sequence with deep learning postprocessing to standard-of-care CT and MRI in pediatric patients. Methods: Patients age <18 for post-trauma or craniosynostosis assessment were eligible. A neuroradiologist and pediatric neurosurgeon blind-reviewed each GA-VIBE. Results: 16 patients were evaluated. 94% of the GA-VIBE scans were acceptable for clinical diagnosis or surgical planning. Of the 14 structural findings, GA-VIBE identified 13 while CT identified one (p<0.001). Of the 18 transient conditions, 12 were identified on GA-VIBE while 13 were identified on CT (p=0.711). Reviewers missed intracranial hemorrhage on GA-VIBE four times, while it was identified on CT 13 out of 15 times. Conclusion: The GA-VIBE sequence with postprocessing is a promising approach to improved pediatric cranial imaging without radiation exposure.

Poster: 84
Student Name: Mallikarjun, Vikranth
Phase/Class: Phase 1/Year 2
Project Title: Balloon Sinuplasty: Utilization trends and content analysis of Reddit discussions
Mentor(s): Farrell, Nyssa
Mentor Department: Otolaryngology

Since its introduction in 2005, Balloon Sinuplasty (BSP) has seen rapid growth, with utilization increasing by 357% over five years.[1] Internet search trends reflect similar public interest,[2] prompting guidelines in 2018 to define appropriate indications.[3] Nonetheless, BSP is marketed for off-label conditions such as allergies, sleep apnea, and headaches.[3] Using Reddit© posts collected via the Social Media Macroscope SMILE tool,[4] we analyzed discussions (2014–2024) on indicated (sinusitis) and non-indicated BSP uses. Among 300 posts, sinusitis accounted for 45.3%, while non-indicated uses comprised 55%. Post frequency rose sharply from 2019–2023 (+48% annually) compared to overall Reddit growth (+14%),[5] with a 192% surge from 2023–2024. Sentiment was predominantly neutral (49%) or negative (38%), with negative perspectives far more common in non-indicated uses (72% vs. 18%; RR=1.50, CI:1.10–2.03). These findings, consistent with rising BSP surgical volumes,[6] highlight increasing divergence from guidelines and suggest worse patient-reported outcomes in off-label contexts.

Poster: 85
Student Name: Manjaly, Cyriac
Phase/Class: Phase 1/Year 1
Project Title: A Novel, Open-Source Model for Artery-Vein Classification in Small-Field OCTA
Mentor(s): Rajagopal, Rithwick
Mentor Department: Ophthalmology & Visual Sciences

Precise artery–vein differentiation is critical for detecting early retinal vascular diseases such as diabetic retinopathy. While existing deep learning methods segment large vessels, they fail to resolve fine near-capillary vasculature in small OCTA scans.
To address this gap, we introduce a novel open-source model that sets a new performance benchmark using just 14 sparsely annotated images—an order of magnitude less data than typically required. Unlike traditional convolutional neural networks that process local patches, our transformer-based approach interprets the full image context, achieving state-of-the-art Dice scores of 93.92% for arteries and 94.36% for veins—a level of accuracy previously unattainable.
Notably, the model is both highly accessible and efficient, and can be trained on a consumer laptop. This work provides the first state-of-the-art tool for small-field OCTA microvasculature classification and introduces novel training strategies, paving the way for new directions in retinal disease research.The model is actively

under development.

Oral Presenter
Student Name: Mazzitelli Perez, Jose
Phase/Class: MSTP Phase 2 / Phase 3
Project Title: Targeting the Bone Marrow Niche to Modify Disease Progression in Rett Syndrome
Mentor(s): Kipnis, Jonathan
Mentor Department: Pathology & Immunology

Rett syndrome (RTT) is a neurodevelopmental disorder caused by mutations in the X-linked gene MECP2. While RTT primarily affects females, MECP2 mutations in males lead to more severe phenotypes and early mortality. Although research has largely focused on neuronal dysfunction, emerging evidence implicates immune mechanisms in disease progression. We identify aberrant myelopoiesis in the skull bone marrow of MeCP2-deficient mice, driven by endothelial dysfunction, resulting in accumulation of monocytes and neutrophils with inflammatory gene signatures in the brain at early disease stages. Endothelial-specific knockdown of MeCP2 recapitulates hematopoietic abnormalities and neurological phenotypes, establishing endothelial dysfunction as a driver of immune dysregulation. Molecular profiling of the bone marrow niche revealed altered signaling pathways and therapeutic targets. Targeted manipulation with monoclonal antibodies extended lifespan and slowed symptomatic progression in MeCP2-deficient mice. These findings uncover a novel bone marrow–CNS axis contributing to RTT pathogenesis and highlight new disease mechanisms and therapeutic opportunities.

Poster: 86
Student Name: McCoy, Lane
Phase/Class: Phase 1/Year 2
Project Title: Perioperative Risk Stratification in Adult Spinal Deformity: The Importance of Metabolic Syndrome vs Obesity
Mentor(s): Neuman, Brian
Mentor Department: Orthopaedic Surgery
Contributed siginifacantly to project: Kotzur, Travis

This retrospective study analyzed 20,118 adults undergoing primary adult spinal deformity (ASD) surgery to evaluate whether metabolic syndrome (MetS) better predicts perioperative complications than obesity alone. Patients were grouped by metabolic and obesity status, with MetS defined as having at least three metabolic abnormalities such as diabetes, hypertension, obesity, hypertriglyceridemia, or low HDL. Outcomes like surgical complications, infections, and revision rates were compared. Results showed MetS patients had significantly higher risks of adverse outcomes—including revision surgery, prosthetic joint infection (PJI), and proximal junctional kyphosis (PJK)—compared to obese patients without MetS and metabolically healthy individuals. While obesity alone increased risks compared to metabolically healthy patients, these were generally lower than those associated with MetS. The study concludes that MetS is a stronger, more consistent predictor of perioperative complications than BMI alone, highlighting the need to consider metabolic health in preoperative risk assessment for ASD surgery.

Poster: 87
Student Name: Mlungwana, Mayande
Phase/Class: Phase 3
Project Title: Anterior Cervical Discectomy and Fusion vs Posterior Cervical Decompression and Fusion for the Treatment of Degenerative Cervical Myelopathy
Mentor(s): Lambrechts, Mark
Mentor Department: Orthopaedic Surgery

Degenerative cervical myelopathy (DCM) is a leading cause of non-traumatic spinal cord impairment, with an incidence of 4.1–60.5 per 100,000 in North America, and a major source of disability in the elderly. Surgery is the standard treatment, but the optimal technique—anterior cervical discectomy and fusion (ACDF) versus posterior cervical decompression and fusion (PCDF)—remains controversial.
We systematically searched PubMed, Scopus, Web of Science, Embase, Google Scholar, Springer Open, and Google with terms “ACDF,” “PCDF,” “patient-reported outcomes,” and “cervical myelopathy.” Eligible studies reported patient-reported outcomes after ACDF and/or PCDF. Funnel and forest plots were generated using standardized mean difference with 95% confidence intervals; heterogeneity was assessed with the I^2 statistic.
Twelve studies met inclusion; seven (655 patients) reported Neck Disability Index (NDI) outcomes. Pooled analysis showed PCDF offered a small but significant improvement in NDI compared with ACDF.
ACDF and PCDF improve outcomes, but PCDF demonstrates superior NDI improvement.

Poster: 88
Student Name: Mologne, Mitchell
Phase/Class: Phase 2
Project Title: Infections after Percutaneous Kirschner Wires for Skeletal Fixation in the Hand and Wrist: Incidence and Management

K-wire infections remain a significant challenge in hand surgery. This study aimed to quantify the frequency of K-wire site infections in the hand and wrist, categorize major and minor infectious manifestations, identify factors predisposing patients to major complications, and generate an updated algorithm for prognostication and treatment. 3425 patients treated with K-wires in the fingers, hand, and wrist were assessed. Of these, 113 patients developed infections, yielding an overall infection rate of 3.3%. The mean age of patients was 46 years, with mean infection presentation at 29.4 ± 18.3 days post-operation. Major complications were observed in 20.4% of infected patients.

Mentor(s): Goldfarb, Charles
Mentor Department: Orthopaedic Surgery

Univariate analysis highlighted purulence, open fractures, and need for a second course of oral antibiotics as significant risk factors for major complications. Multivariable regression confirmed only purulence and necessity for additional antibiotics as significant predictors. These findings underscore the importance of vigilant follow-up and prompt intervention in managing K-wire infections.

Poster: 89
Student Name: Muir, Mason
Phase/Class: Phase 1/Year 2
Project Title: Treatment delays mediate age-related disparities in neoadjuvant chemoradiotherapy for locally advanced rectal cancer: A National Cancer Database matched cohort analysis
Mentor(s): Hong, Dan; Cao, Yin
Mentor Department: Medicine

Rectal cancer incidence is rapidly increasing in populations under 50 years old, often with later diagnoses of locally advanced rectal cancer (LARC). Newer treatment paradigms such as Total Neoadjuvant Therapy (TNT) offer improved survival and potential to spare some patients from surgical toxicities. However, younger patients may face unique obstacles to treatment adherence such as time off work, psychological impact, and family responsibilities. This study analyzed predictors of neoadjuvant chemoradiotherapy (NCRT) receipt in a 1:1 TNM-based matched cohort (N=35,956) of patients under and over 50 years old within the National Cancer Database (NCDB). Using multivariate logistic regression, younger age and private insurance were identified as significant predictors for receiving NCRT. Causal mediation analysis revealed treatment delay as a significant mediator between age and distance to care on NCRT receipt (indirect effect: -0.0033, p<0.001), highlighting the need for interventions to ensure timely onset of care in younger patients.

Poster: 90
Student Name: Nguyen, Khai
Phase/Class: MSTP Phase 2 / Phase 3
Project Title: Immune receptor repertoire reconstruction from transcriptomic data reveals dynamics of adaptive immunity in acute invasive fungal sinusitis
Mentor(s): Roland, Lauren
Mentor Department: Otolaryngology

Acute invasive fungal sinusitis (AIFS) is a highly lethal infection in immunocompromised individuals, yet the role of adaptive immunity remains poorly defined. We reconstructed B- and T-cell receptor repertoires from bulk transcriptomes of AIFS and control sinonasal biopsies. AIFS was characterized by increased clonal expansion and reduced repertoire diversity across both BCRs and TCRs, with skewed BCR heavy chain usage toward IGHV4-31. Somatic hypermutation rates were reduced, particularly in IgG and IgA, and BCR chains exhibited distinct biophysical features. Transcriptomic deconvolution demonstrated depletion of naïve and memory B cells as well as $CD4^+$ and $CD8^+$ T cells. These findings indicate substantial adaptive immune dysregulation in AIFS. Further single-cell studies are warranted to delineate the underlying mechanisms, and immunomodulatory therapies, including recombinant cytokines, may hold promise as adjuncts to surgical management.

Poster: 91
Student Name: Nguyen, Don
Phase/Class: Phase 1/Year 2
Project Title: Noninvasive and Multiparametric Profiling of Ocular Surface Immune Cells in Patients with Uveitis
Mentor(s): Walsh, James
Mentor Department: Ophthalmology & Visual Sciences

Background/Significance: Uveitis has numerous etiologies and is typically assessed via clinical presentation, with few causalities substantiated by diagnostic tests. To expand analytical tools, this exploratory study evaluated the application of a noninvasive ocular surface lavage for immunophenotypically characterizing cell populations on the surface of the eye.
Methods: Patients were recruited from the uveitis service at Washington University Eye Center. The ocular surface was then lavaged immediately upon awakening the following morning, and immune cell types were subsequently analyzed through flow cytometry.
Results: Among controls, the ocular surface immune landscape remained largely stable over time, although the proportion and amount of immune cell populations varied considerably between individuals, including in patients with uveitis.
Conclusions/Next Steps: These initial findings substantiate the feasibility and promise of a noninvasive assay for immunoprofiling the cells on the ocular surface. Future studies will encompass examining whether those signatures align with specific types of uveitis.

Poster: 92
Student Name: O'Riordan, Andrea
Phase/Class: Phase 3

Rates of endometrial cancer among premenopausal women are rising as obesity increases. However, many OBGYN providers don’t feel equipped to discuss weight with obese patients. In contrast, bariatric surgery patients are seen explicitly for weight management and represent a population at high risk for

Project Title: Escaping the O-Loop: Endometrial Cancer Risk in Bariatric Surgery Patients
Mentor(s): Hagemann, Andrea
Mentor Department: Obstetrics & Gynecology

endometrial atypical hyperplasia and cancer. We collaborated with a bariatric surgery clinic at WashU to assess access to OBGYN care, anovulatory cycles, and red flag symptoms for endometrial cancer. Between March and July 2025, 140 women completed the questionnaire; 94 (67%) were reproductive age (18-45). Of these, 22 (23%) had no OBGYN. While 67 (71%) had regular cycles, only 17 (18%) had no additional symptoms (i.e. heavy periods, spotting). Eighteen (19%) reported amenorrhea, and nine (9.6%) had prior hysterectomy. These findings suggest that many bariatric patients lack gynecologic care but have abnormal cycles, highlighting an opportunity for interdisciplinary collaboration to improve early detection and prevention.

Poster: 93
Student Name: Pan, Shelei
Phase/Class: Phase 1/Year 1
Project Title: Re-evaluating the presumptive role of ependymal cilia in ventricular CSF transport: molecular and functional insights from intraventricular hemorrhage-posthemorrhagic hydrocephalus
Mentor(s): Strahle, Jennifer
Mentor Department: Neurosurgery

Intraventricular blood exposure leading to ependymal motile cilia dysfunction has been proposed as a pathogenic cause of hydrocephalus after intraventricular hemorrhage (IVH). However, the spatiotemporal nature of the putative link between IVH and motile cilia loss has not been established, and there are no mechanistic studies definitively linking motile cilia and hydrocephalus pathophysiology. Here, we report spatial heterogeneity in the cellular composition of the ventricular surface, and that IVH is associated with region-specific alterations to ependymal GFAP and Foxj1 expression, but not motile cilia. Bulk-RNAseq demonstrates IVH does not result in changes to the ventricular expression of cilia assembly, maintenance, and structural genes. Functionally, we identify three previously uncharacterized cilia-mediated CSF flow domains in the lateral ventricle and show that IVH does not disrupt their organization. These data represent significant departures from the hypotheses that 1. motile cilia dysfunction exists after IVH, and 2. motile cilia play a role in hydrocephalus pathogenesis.

Poster: 94
Student Name: Parekh, Kavya
Phase/Class: Phase 2
Project Title: National Trends in Adolescent and Young Adult Opioid Use Disorder Admissions
Mentor(s): Joynt Maddox, Karen
Mentor Department: Medicine

Opioid use disorder (OUD) is a pervasive crisis in America. Few studies have analyzed national OUD trends among children and young adults, specifically demographics and in-hospital outcomes. This study utilizes the 2017-2021 National Inpatient Sample (NIS) to evaluate opioid abuse, dependence, and poisoning, compared between adolescents (12-17) and young adults (18-25). In addition, we will analyze trends in disparities in race and urban-rural demographics, length of hospital stay, and mortality, utilizing T tests and chi-squared tests. Initial analyses from 2021 NIS data shows that children had longer lengths of stay than young adults. Children were additionally hospitalized at significantly higher rates with opioid poisoning diagnoses, as compared to higher rates of opioid dependence and abuse diagnoses in young adults. Overall, this shows that OUD type in children and young adults can differ, which can help target interventions for the two populations separately. Furthermore, understanding OUD trends will help hone policy.

Poster: 95
Student Name: Poulin, Noah
Phase/Class: Phase 1/Year 2
Project Title: Plasma proteomic biomarkers of degenerative cervical myelopathy in the UK Biobank
Mentor(s): Greenberg, Jacob
Mentor Department: Neurosurgery

The diagnosis of degenerative cervical myelopathy (DCM) relies on correlating symptoms and signs with neuroimaging. Plasma proteomics represents an opportunity to establish objective, blood-based biomarkers, and may clarify shared pathophysiology with other diseases, such as multiple sclerosis (MS) and peripheral neuropathy (PN). Here, we examined the proteomic profiles associated with DCM, MS, and PN using data from the UK Biobank. Participants with a diagnosis of DCM (n=42), MS (n=125), or PN (n=101) within 5 years of blood draw were compared with those without known neural injury or disease (n=39,519) using case-control matching. Top proteins associated with DCM included RNA-binding Fox-1 homolog 3 and neurofilament light chain (NfL), markers of neuronal injury. These proteins were also elevated in PN, and NfL was increased in MS. Our findings indicate that blood protein profiles can detect neural injury in DCM, with potential for diagnostic, monitoring, and prognostic applications.

Poster: 96
Student Name: Sane, Eshan
Phase/Class: Phase 2
Project Title: Thoracic Compensation after Pediatric Lumbar Spinal Fusion
Mentor(s): Montgomery, Blake
Mentor Department: Orthopaedic Surgery

For pediatric patients with idiopathic scoliosis, spinal fusion remains as a standard and beneficial treatment. After lumbar-only spinal fusion, the thoracic spine above the now-fused lumbar vertebrae may compensate by becoming more kyphotic in the sagittal plane. This phenomenon has been described in adults, however these changes in pediatric idiopathic scoliosis had previously not been characterized.
A sample of 45 patients demonstrated that the thoracic spine became more kyphotic after lumbar surgery (Mean difference pre-op to 2 years of 4.7°, p< 0.05). Additionally, the lumbar segments became more lordotic after surgery (Mean difference pre-op to 2 years = -5.6°, p< 0.05). These effects are independent of the amount of fusion and age at surgery (r = -0.07, and r = 0.02 respectively) and become pronounced in patients with low sagittal-plane pre-operative curvature. Anticipating these adaptions will help guide surgical planning and allow for optimizing the sagittal plane.

Poster: 97
Student Name: Santoki, Aditya
Phase/Class: Phase 2
Project Title: Physician Industry Payments and Intravitreal Injection Use in Medicare, 2017–2023
Mentor(s):
Mentor Department:
Contributed significantly to project: Manjaly, Cyriac

Background: Industry payments to ophthalmologists may influence utilization of high-cost intravitreal drugs. Objective: Quantify association between physician-level industry payments from anti-VEGF manufacturers and Medicare utilization of intravitreal injections. Methods: Retrospective longitudinal panel of CMS Open Payments linked to Medicare Part B Physician/Supplier data, 2017–2023. Exposure: annual manufacturer-specific payments (consulting, speaking, royalties). Outcome: annual counts of intravitreal injections (HCPCS 67028) and drug units (J0178, etc.) per physician. We estimate within-physician associations using two-way fixed-effects Poisson/negative binomial models with year fixed effects, clustering by physician; sensitivity analyses exclude outlier acquisition/royalty payments. Results: Descriptives show physicians in the upper decile of industry payments generally deliver higher Medicare service volumes; full model estimates quantifying the association between drug-specific payments and injection utilization will be reported. Conclusions: Linking Open Payments with Medicare suggests a potentially meaningful relationship between industry engagement and intravitreal therapy use; fixed-effects models will clarify magnitude and policy implications.

Poster: 98
Student Name: Schnieders, Jack
Phase/Class: Phase 1/Year 2
Project Title: IpsiHand Therapy for Rehabilitation After Pediatric Stroke
Mentor(s): Roland, Jarod
Mentor Department: Neurosurgery

Pediatric stroke survivors often have life-long motor deficits that remain after standard clinical rehabilitation (Felling 2020). Enhancing post-stroke recovery in children is vital given their longer life expectancy compared to adults, as even incremental improvements in functional outcomes significantly increase patient quality-of-life years. The IpsiHand system, a brain-computer interface controlled by signals from the motor cortex contralateral to the stroke lesion, has been shown to improve function in adult chronic stroke patients (Bundy 2017). Its efficacy in pediatric patients is untested. Here we assess chronic stroke recovery in one pediatric patient by comparing performance on the NIH Toolbox 9-hole pegboard dexterity test, and functional connectivity (FC) in motor areas assessed with 3T resting-state functional MRI, before and after a 12-week IpsiHand intervention. Improvement in these measures post-intervention will offer preliminary support for IpsiHand as a post-stroke therapy for pediatric patients, though further investigation with a larger sample is needed.

Poster: 99
Student Name: Serota, Danielle
Phase/Class: Phase 2
Project Title: Acitretin use for chemoprevention of keratinocyte carcinoma in immunocompetent and immunosuppressed patients
Mentor(s): Michalski-McNeely, Basia

Keratinocyte carcinoma (KC) disproportionately affects immunosuppressed individuals, yet no FDA-approved therapies exist for KC prevention. Acitretin, a systemic retinoid, is used off-label for chemoprevention in high-risk populations. This multicenter retrospective study evaluates whether acitretin therapy significantly reduces KC incidence in immunosuppressed and immunocompetent patients and whether this effect is dose-dependent. We aim to assess incidence of invasive KC before and after acitretin use, characterize dosing patterns, and examine a potential rebound effect following cessation. Twenty sites across the U.S. are participating, with secure data collection via

Mentor Department: Medicine
Contributed significantly to project: Guennoun, Ranya

REDCap. Preliminary studies suggest benefit, but existing data are limited by small sample size and lack of dosing stratification. By aggregating data from over a dozen institutions, this study will address gaps in evidence and may help define optimal dosing strategies for KC chemoprevention. Data collection is currently underway; results are forthcoming.

Poster: 100
Student Name: Sharp, Cory
Phase/Class: MD5
Project Title: Assessment of Growth Differentiating Factor 15 in Tears and Aqueous Humor of Patients with Glaucoma
Mentor(s): Apte, Rajendra
Mentor Department: Ophthalmology & Visual Sciences

Glaucoma, the leading cause of irreversible blindness, is characterized by elevated intraocular pressure that leads to progressive retinal ganglion cell (RGC) degeneration. Current diagnostic methods do not reliably correlate with disease severity, underscoring the need for a method of precisely monitoring RGC health. Growth Differentiating Factor 15 (GDF15) detectable in the aqueous humor (AH) of glaucoma patients has emerged as a promising molecular marker for RGC stress and injury. This study aims to determine if elevated levels of GDF15 are also detectable in the tears of glaucoma patients. We will recruit approximately 50 patients undergoing either cataract or glaucoma surgeries. Tear fluid and AH samples will be collected preoperatively and intraoperatively, respectively. GDF15 levels will be quantified using the Quantikine ELISA kit and mass spectrophotometry. Positive findings could revolutionize glaucoma management by providing a less invasive method for monitoring disease progression, enhancing therapeutic decision-making, and ultimately improving patient outcomes.

Poster: 101
Student Name: Sigel, Byron
Phase/Class: Phase 2
Project Title: Trends in Multiple Myeloma Diagnosis in U.S. Veterans Pre- and Post-SLiM-CRAB Criteria
Mentor(s): Sigel, Byron
Mentor Department: Surgery

Multiple myeloma (MM) underwent a diagnostic criteria shift with the October 2014 SLiM-CRAB criteria. We assessed the trend of MM diagnosis pre- and post-criteria in the U.S. Veterans Health Administration during 2000–2019. Diagnoses were identified using a published and validated natural language processing algorithm. Disease burden was categorized as high-burden (versus low-burden) based on β2-microglobulin ≥3.5mg/L, albumin <3.5g/dL, lactate dehydrogenase >250U/L, or bone marrow plasma cells >50% within 6 months before a diagnosis. Interrupted time-series analysis was performed, using 2015 as the interruption point. Total number of MM diagnoses increased from 355 in 2000 to 705 in 2019. The analysis demonstrated a significantly higher annual increase post-2015 compared to pre-2015 in low-burden cases (p=0.001). Our findings suggest that the SLiM-CRAB criteria promoted early detection, with an increased rate of patients diagnosed at low burden. Future studies should examine the impact on treatment utilization and patient survival.

Poster: 102
Student Name: Singer, Sydney
Phase/Class: Phase 1/Year 2
Project Title: Recent Trends in the Utilization of Molecular Breast Imaging in the United States
Mentor(s): Lee, Michelle
Mentor Department: Radiology

Objective: The objective of this study was to assess trends in Molecular Breast Imaging (MBI) utilization among privately insured women in the United States (U.S.) from 2017-2022.
Methods: The utilization of MBI among women aged 25-64 years from January 1, 2017, to December 31, 2022, was obtained using the MarketScan Commercial Database. MBI utilization was captured from the outpatient services file using Current Procedural Terminology (CPT) or Healthcare Common Procedure Coding System (HCPCS) codes for MBI. During the 6-year retrospective claims analysis, 3,024 study-eligible women underwent 3,648 MBI exams.
Results: Utilization of MBI in the United States remains limited, with only 32 sites reporting the availability of this modality. The overall trend in MBI utilization was relatively stable from 2017-2021, with a 33% reduction in utilization in 2022. The lowest utilization rate was in 2022 at 5.6 per 1000 person-years of observation. Of the women who underwent MBI with sufficient follow-up, 83% underwent only one examination during the study period.
Conclusion: MBI is a functional imaging method that can identify breast cancers, but utilization is low.

Poster: 103
Student Name: Sofia, Justin
Phase/Class: Phase 1/Year 2
Project Title: Decoding the Obesity Paradox in Cancer: Evaluating BMI as a Prognostic Indicator in Eight Solid Tumors
Mentor(s): Piccirillo, Jay
Mentor Department: Otolaryngology

Background: The "obesity paradox" describes the phenomenon of improved survival in cancer patients with obesity, notably in melanoma and non-small cell lung cancers. The independent prognostic impact of obesity is still not established in many solid cancers.
Methods: This retrospective cohort study will analyze 95,000 patients diagnosed with melanoma, non-small cell lung, breast, oropharyngeal, laryngeal, colorectal, prostate, or endometrial cancers at Siteman Cancer Center from 1995-2019. We will explore the change in the prevalence of obesity over time for each cancer site. We will employ Cox proportional hazard models to evaluate the prognostic impact of obesity on overall and disease-free survival, controlling for age, sex, race, TNM stage, and other comorbidities captured by the Adult Comorbidity Evaluation-27 comorbidity index.
Expected Outcomes: We hypothesize obesity will demonstrate an independent differential prognostic impact across cancer types.
Significance: This study will yield insights into obesity's role in cancer prognosis and improve prognostic accuracy.

Poster: 104
Student Name: Song, Isabella
Phase/Class: Phase 1/Year 2
Project Title: Post-Operative Outcomes Following Surgical Resection of Prolactinomas
Mentor(s): Silverstein, Julie; Kim, Albert
Mentor Department: Neurosurgery

First-line treatment for prolactinomas involves dopamine agonist (DA) therapy, regardless of tumor size. However, DA therapy is not feasible in all patients due to DA resistance, side effect intolerance, and patient preference. For these patients, endoscopic endonasal transsphenoidal surgery (EETS) is often performed. In this study, we compared the post-operative remission rates and outcomes of patients with microadenomas (<10mm) and macroadenomas (>10mm) of all adult Barnes-Jewish Hospital patients that underwent EETS between 1999-2024. 78 patients were analyzed in total, including 10 (12.8%) with microprolactinomas and 68 (87.2%) with macroprolactinomas. Alongside descriptive statistics on patient demographics, reasons for surgery, and post-operative complications, one of our key findings was that remission was achieved in 57.1% (4/7) of microadenoma patients and 75.6% (31/41) of macroadenoma patients. Overall, our patients with microprolactinomas and macroprolactinomas demonstrated broadly similar post-operative outcomes, supporting the potential role of surgery in patients with prolactinomas regardless of tumor size.

Poster: 105
Student Name: Stanford-Hill, Riley
Phase/Class: Phase 1/Year 2
Project Title: EIT-Guided PEEP Selection in a Porcine ARDS Model: Correlation with Mechanical Energy and Right Heart Mechanics
Mentor(s): Katira, Bhushan
Mentor Department: Pediatrics

Acute respiratory distress syndrome (ARDS) is a life-threatening syndrome characterized by disruption of the alveolar-capillary barrier pulmonary edema, inflammation, and severe hypoxemia, with mortality rate of 40-50% for adults and 30% for children. Mechanical ventilation, though lifesaving, poses a risk of ventilator-induced lung injury (VILI), associated with excessive injurious mechanical power delivered to the lungs. Electrical impedance tomography (EIT) provides beside regional ventilation monitoring offering the potential to guide individualized ventilatory strategies.
In this study, 6 Yorkshire pigs were sedated, intubated, and instrumented. A two-hit ARDS model was established using repeated warm saline lavages and 1.5 hours of high-stretch ventilation. Following a decremental PEEP trial, EIT derives the optimal PEEP that minimizes collapse and hyperdistention. Post experiment pressure–volume loop area analysis confirmed that the EIT-determined PEEP corresponded to the point of maximal mechanical energy efficiency. Further work will establish whether this PEEP also corresponds to optimal right heart mechanics.

Poster: 106
Student Name: Stapley, Brendan
Phase/Class: Phase 1/Year 2
Project Title: Prevalence and Predictors of Cognitive Dysfunction After Surgery: A

Background: Although general anesthesia has been demonstrated to be relatively safe, long-term cognitive impairment following surgery remains a prevalent concern amongst patients. Previous studies on post-anesthetic cognitive impairment have primarily relied on formal neurocognitive exams; few studies have examined patients' subjective experiences with long-term cognitive dysfunction after general anesthesia.

Retrospective Cohort Study
Mentor(s): Fritz, Bradley
Mentor Department: Anesthesiology

Methods: We will conduct a retrospective cohort study using data from the SATISFY-SOS study, which examined surgical patients' self-reported perceptions of their health and functional status. Data was collected at patients' baseline prior to surgery, 30 days after surgery, and one year after surgery. We will assess the frequency of cognitive dysfunction after surgery and identify variables present at baseline and 30 days after surgery that are predictive of changes to patients' self-perceived cognitive ability.
Results: I am in the early stages of this project, using R to clean data, perform descriptive statistics, and commence statistical analysis to accomplish project aims.

Poster: 107
Student Name: Vandenberg, Caleb
Phase/Class: Phase 1/Year 2
Project Title: Distal Triceps Tendon Rupture Repair Results in High Return to Sport Rates for Amateur and Professional Athletes: A Systematic Review
Mentor(s): Knapik, Derrick; Touhey, Dan
Mentor Department: Orthopaedic Surgery

Objective: Distal triceps tendon ruptures (DTTR) are uncommon but debilitating injuries in athletes. Surgical repair restores elbow function, but return-to-sport (RTS) data are limited.
Methods: A systematic review of 32 studies (286 athletes, 294 elbows) from PubMed, EMBASE, and Cochrane through June 2025 was performed. Inclusion criteria focused on athletes undergoing DTTR repair, with reported injury characteristics, RTS rates and timing, and complications.
Results: Mean age was 39.4 years; 96.5% male. Weightlifting (39.5%) and football (29.1%) were predominant sports. Mean time to surgery was 2.2 months. 93.6% of patients achieved RTS at a mean 5.3 months; 63.6% returned to equal or higher competition. Infrequent complications included reoperation (7.1%) and re-rupture (4.3%). Functional outcomes showed low pain and high elbow performance scores.
Conclusion: Surgical repair of DTTR in athletes leads to excellent RTS rates within six months and low complication risk, supporting its use as the preferred treatment for active populations.

Poster: 108
Student Name: Wang, Felicia
Phase/Class: Phase 2
Project Title: Energy Conservation in MRI: Sequence Selection and Operational Strategies
Mentor(s): Northrup, Benjamin
Mentor Department: Radiology

The healthcare system accounts for approximately 10% of US greenhouse gas emissions, much of which is due to imaging, particularly magnetic resonance imaging (MRI). This study investigates the components of MRI energy consumption of comparable sequences that may be interchangeable in clinical practice. MRI energy expenditure of one machine was monitored for one month. Energy measured in kWh was separated into usage by gradients and all other functions. Patient data was aggregated by sequence and analyzed. The cumulative energy consumption was 20,508.84 kWh, with 76.89% (15,769.11 kWh) attributed to gradient systems and 23.11% (4,739.74 kWh) to system electronics. Energy-efficient alternatives demonstrated a 20-49% reduction in per-sequence consumption compared to conventional approaches. There were also differences in energy consumption between gradient and system electronic components of MRI systems. Implementation of sequence substitutions, as well as utilizing "low-power" settings and cost-effective scheduling can reduce the cost and environmental impact of radiological services.

Poster: 109
Student Name: Wang, Danyi
Phase/Class: Phase 1/Year 2
Project Title: Lost In Transition: Long-Term Follow-Up in Traumatic Brain Injury Patients
Mentor(s): Henriquez, Marco; Kranker, Lindsay
Mentor Department: Surgery

Background: Traumatic brain injury (TBI) often results in long-term neurologic and cognitive symptoms. Outpatient follow-up is critical for identifying residual deficits and optimizing recovery. We hypothesized that most TBI patients do not receive routine post-discharge follow-up or ancillary services.
Methods: We conducted a retrospective review of all admitted TBI patients at a single center (Jan 2022–Jan 2024). Included patients had radiographically confirmed TBI and were expected to survive. Charts were reviewed for outpatient appointments and referrals to services including physical therapy, occupational therapy, speech-language pathology, and neurocognitive testing.
Results: Of 1,142 patients, 605 (53%) returned for follow-up, mostly for imaging or post-surgical care. Documentation rarely addressed quality of life or cognitive deficits; ancillary referrals were rare (<2%). Follow-up was less likely among uninsured patients and those discharged to non-rehabilitative settings.

Conclusion: Nearly half of TBI patients lacked outpatient follow-up, and ancillary service use was minimal, highlighting gaps in post-acute care.

Poster: 110
Student Name: Wang, Joanne
Phase/Class: Phase 1/Year 2
Project Title: Understanding the Association between Electronic Health Record (EHR) Secure Messaging and Subsequent Wrong-Patient Ordering Errors
Mentor(s): Lew, Daphne; Lou, Sunny
Mentor Department: Anesthesiology

EHR-integrated secure messaging is frequently used for clinical communication. Recent studies found that higher secure messaging use was associated with increased odds of wrong-patient ordering errors in inpatient clinicians. The goal of this study was to evaluate the timing of secure messages relative to wrong-patient ordering events. We analyzed clinician retract-and-reorder events and secure messaging metadata from 14 academic and community hospitals between January 10, 2023-April 30, 2023. Clinicians sent an average of 2.17 (SD 3.03) messages 10 minutes before the wrong-patient ordering event and 1.75 (1.18) messages after. They received an average of 1.89 (1.62) messages 10 minutes before and 2.11 (1.73) messages after. These preliminary results suggest that increased messaging surrounding wrong-patient ordering events may be related to increased cognitive load or increased communication about the error. Future analyses will compare these results to messaging behaviors surrounding non-wrong-patient ordering events.

Poster: 111
Student Name: Wright, Christian
Phase/Class: Phase 1/Year 1
Project Title: Rib Flare Distance: A Novel and Highly Reliable Radiographic Metric of the Rib Cage Deformity in Adolescent Idiopathic Scoliosis
Mentor(s): Montgomery, Blake
Mentor Department: Orthopaedic Surgery

Rib cage deformity in Adolescent Idiopathic Scoliosis (AIS) significantly affects pulmonary function and cosmetic appearance, but current assessment tools lack reproducibility. Our study proposes the Rib Flare Distance (RFD), a novel radiographic metric, and evaluates its reliability, clinical relevance, and ability to distinguish AIS patients from controls. In this retrospective study, two independent observers measured RFD in 40 AIS patients and 20 age-matched controls. Inter- and intra-observer reliability were excellent (ICC = 0.986; 0.993) with low variability (2.4mm; 1.8mm via Bland-Altman analysis). RFD showed strong discriminatory ability on ROC curve analysis (AUC = 0.941). Further, it correlated moderately with thoracic Cobb angle (r=0.544, p=0.0003) and RVAD (r=0.409, p=0.009), and weakly with scoliometer (r=0.326, p=0.040). Our findings demonstrate that RFD is a highly reproducible and clinically relevant metric. With further validation, RFD could become an integral component of AIS assessment by guiding treatment of the rib cage deformity.

Poster: 112
Student Name: Xiao, Mark
Phase/Class: Phase 1/Year 2
Project Title: Post-COVID era Trends in Ambulatory Mastectomy and Breast Reconstruction
Mentor(s): Sacks, Justin; Myckatyn, Terence
Mentor Department: Surgery

The COVID-19 pandemic accelerated a shift in breast reconstruction and mastectomy care towards outpatient settings to preserve hospital capacity. This change, born from crisis, warrants examination as a potential lasting paradigm shift. Using NSQIP data from pre-COVID (2015-2019), during COVID (2020), and post-COVID (2021-2023), we compared procedure characteristics.
Our results show a statistically significant increase in outpatient procedures across all timeframes for both mastectomy (51.7% to 64.7%) and breast reconstruction (27.9% to 41.5%). Specifically, Direct-to-Implant/Tissue Expander procedures became disproportionately outpatient, with a shorter length of stay. The proportion of flap-based reconstructions also increased. These findings indicate a sustained post-COVID shift towards outpatient care, likely driven by the adoption of new surgical techniques and optimized hospital workflows. This trajectory reflects a successful and enduring adaptation to resource constraints, though the long-term implications require ongoing scrutiny as healthcare delivery continues to evolve.

Poster: 113
Student Name: Yang, Anna
Phase/Class: Phase 2
Project Title: Longitudinal Transcriptomic Analysis in Older Adults

Postoperative delirium is a frequent complication in older adults after elective cardiac surgery, but its biological underpinnings remain poorly defined. In the MENDEL cohort (n=61), 41% developed delirium between postoperative day (POD) 1–4. Preoperative depressive symptoms were significantly associated with delirium incidence (p<0.05). Gene ontology enrichment analyses revealed two distinct immune trajectories. On POD1, delirium-absent patients exhibited balanced activation of innate and adaptive immune pathways, followed by

Undergoing Cardiac Surgery and Relationships to Postoperative Delirium
Mentor(s): Smith, Kendall
Mentor Department: Anesthesiology

dampening of inflammatory signaling and initiation of tissue repair. In contrast, delirium-present patients showed sustained innate immune activation with impaired adaptive regulation, extracellular matrix remodeling, and dysregulated cytokine signaling. By POD4, delirium-absent patients demonstrated immune resolution and a return to homeostasis, whereas delirium-present patients continued to display persistent dysregulation, with enrichment of neutrophil activity, complement cascade, and maladaptive vascular signaling. These findings suggest that preoperative vulnerability and prolonged postoperative immune imbalance contribute to delirium, identifying biological pathways that may be targeted for prevention and improved recovery.

Poster: 114
Student Name: Youdes, Caroline
Phase/Class: Phase 1/Year 2
Project Title: Caregiving & Cannabis: Influences on Infant Temperament at Six Months
Mentor(s): Rogers, Cynthia; Agrawal, Arpana
Mentor Department: Psychiatry

Importance: Maternal responsiveness fosters secure attachment and emotion regulation, yet its link to early caregiver-reported temperament remains understudied. Prenatal cannabis exposure may alter this association.
Objective: To examine whether maternal responsiveness at 6 months postpartum relates to infant temperament and whether prenatal cannabis exposure modifies this relationship.
Design, Setting, and Participants: Cross-sectional secondary analysis of 143 mother–infant dyads from the Cannabis Use During Development and Early Life (CUDDEL) cohort.
Measures: Maternal responsiveness (My Emotions Questionnaire), infant temperament (Negative Affectivity and Orienting/Regulatory Capacity; Infant Behavior Questionnaire–Revised), and prenatal cannabis exposure (self-report, urine toxicology)..
Analysis: Linear regression models adjusted for maternal age, depressive symptoms, perceived stress, Area Deprivation Index, infant sex, and gestational age.
Expected Results: Higher responsiveness will be associated with lower Negative Affectivity and higher Regulation, with weaker associations among cannabis-exposed infants.

Poster: 115
Student Name: Yuan, Matthew
Phase/Class: Phase 1/Year 2
Project Title: Asymmetric Presentation of Angle Closure Glaucoma
Mentor(s): Liu, James
Mentor Department: Ophthalmology & Visual Sciences

Background: Primary angle-closure glaucoma (PACG) is frequently misdiagnosed as primary open-angle glaucoma (POAG), especially in patients with asymmetric disease, delaying treatment and risking vision loss.
Methods: This retrospective case series included 12 patients (24 eyes) referred as POAG with asymmetric optic nerve findings. Chart review and gonioscopic re-evaluation were performed.
Results: All patients were re-assessed as PACG. Referring providers recorded more open angles (mean Shaffer grade 3.5, where higher values indicate wider angles) compared to repeat gonioscopy (mean 1.9). Peripheral anterior synechiae (PAS, iris adhesions consistent with angle closure) were present in 87% of re-evaluated eyes. Inter-eye differences were observed in RNFL (24.9 μm), GCC (12.3 μm), mean deviation (8.4 dB), and cup-to-disc ratio (0.19) (all p < 0.001).
Conclusion: Asymmetric glaucoma should raise suspicion for PACG. Routine gonioscopy is essential for accurate diagnosis. Prospective studies are warranted to evaluate misdiagnosis in this population.