RUSH UNIVERSITY

TRAINEE RESEARCH DAY

ABSTRACT BOOK

February 19, 2026

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Welcome From the President

Welcome to Trainee Research Day!

This event is a wonderful opportunity to highlight the tremendous research taking place every day at Rush. Trainee Research Day showcases the creativity, commitment and hard work of our trainees, while also recognizing the faculty members who provide invaluable training and mentorship to the next generation of health care leaders.

I invite you to explore this booklet of abstracts. I am confident you will be as impressed as I am by the breadth, depth and quality of the work represented.

I invite you to stop by one or all of the Trainee Research Day events on Thursday, Feb. 19 and learn more about the valuable work happening here at Rush.

Time & Location	Time & Location
9 a.m. – 4 p.m. Atrium Lobby	**Poster Viewing**
9 – 9:10 a.m. AAC 539	**Welcome** Julie Hoff, PhD, RN, FNAP, FAAN, Provost, Rush University
9:15 a.m. – Noon AAC 539	**Oral Presentation Awards** (*10-minute presentations and five-minute Q&A)* Moderators: Julie Hoff, PhD, RN, FNAP, FAAN, Provost, Rush University Debbie Martin, PhD, Vice Provost, Student Affairs, Rush University
Noon – 2 p.m.	**Poster Viewing**
2 – 4 p.m. Atrium Lobby	**Poster Presentations** • 2 – 3 p.m. Odd poster numbers • 3 – 4 p.m. Even poster numbers
4:30 – 5 p.m. Room 500, Main Lounge	**Last Lecture** **Christine Kennedy, PhD, RN, FAAN** John L. & Helen Kellogg Dean College of Nursing, Rush University
5 – 6:30 p.m. Room 500, Main Lounge	**Award Ceremony and Reception**

Both oral and poster presentations are essential components of the educational experience for our trainees. By attending, engaging and asking questions, you contribute to their growth — and you may learn something new as well.

We also invite you to join us at the Room 500 reception, where we will celebrate our trainees and come together as a community. The award ceremony and reception will take place from **4:30 to 6:30 p.m.** During this time, Dr. Kennedy will give her last lecture.

I look forward to seeing you there.

With thanks and appreciation,

Robert S.D. Higgins, M.D., M.S.H.A.
President and Chief Academic Officer, Rush University
Chief Clinical and Academic Officer and Senior Vice President, Rush University System for Health

Acknowledgements

During Trainee Research Day, please take a moment to say *thank you* to everyone who helped make this event possible.

Moderators
- Julie Anne Hoff, PhD, RN, FAAN, Provost, Rush University
- Debbie Martin, PhD, Vice Provost of Student Affairs, Rush University

Vice Deans for Research
- Lauren M. Little, PhD, OTR/L, Associate Dean of Research, College of Health Sciences
- Barbara A. Swanson, PhD, RN, FAAN, ACRN, Associate Dean for Research, College of Nursing
- Lena Al-Harthi, PhD, Vice Dean for Research, Rush Medical College

Rush Services
- Antonio Mendoza, Quick Copy
- Room 500 Staff
- Laurie Ann Bender, Office of the Registrar
- Creative Media Group, Rush

Volunteers
Thank you to our volunteers: David Gerard, Danita Schaal, Monique Austin, Rita Eaddy, Aleksandra Danilovic, and Evelyn Jackson.

And a very special “thank you” to Norma Sandoval. Norma makes Trainee Research Day happen, and we are deeply grateful for her dedication and hard work.

Regards,

Bethany Martell
Vice President, Research Operations
Office of Reseach Affairs, Rush University

Trainee Research Day

Thursday, February 19, 2026
At-A-Glance

Time & Location	Time & Location
9 a.m. - 4 p.m. Atrium Lobby	**Poster Viewing**
9 – 9:10 a.m. AAC, 539	**Welcome** Julie Hoff, PhD, RN, FNAP, FAAN, Provost, Rush University
9:15 – 11:55 a.m. AAC, 539	**Oral Presentation Awards** (*10-minute presentations & 5-minute Q&A)* Moderators: Julie Hoff, PhD, RN, FNAP, FAAN, Provost, Rush University Debbie Martin, PhD, Vice Provost of Student Affairs, Rush University
9:15 - 9:25 a.m.	**Darbaz Adnan, MBChB, MS** (RMC: DTS)
9:30 – 9:40 a.m.	**Sierra Broad, DO, MPH** (Clinical Resident)
9:45 – 9:55 a.m.	**Kelsey Page, BS** (CHS: MS)
10 – 10:10 a.m.	**Ohm Shukla, MS** (RMC: M2)
10:15 – 10:25 a.m.	**Aaliyah Ellison-McPeters, BS** (CON: MS)
10:30 – 10:40 a.m.	**Kristen Halko, BSN** (CON: DNP)
10:45 – 10:55 a.m.	**Eleanor Kraichely, BA** (CHS: MS)
11 – 11:10 a.m.	**Kaveh Torabian, MS** (RMC: M3)
11:15 – 11:25 a.m.	**Yulu Wang, MD** (Post-Doctoral Research Fellow)
11:30 – 11:40 a.m.	**Jun Oike, MD, PhD** (Post-Doctoral Research Fellow)
11:45 – Noon	**Kristy Urquhart, BS** (RMC: DTS)
Noon – 2 p.m.	**Poster Viewing**
2 – 4 p.m. Atrium Lobby	**Poster Presentations** • 2 – 3 p.m. Odd poster numbers • 3 – 4 p.m. Even poster numbers
4:30 –5 p.m. POB, Room 500	**Last Lecture** **Christine Kennedy, PhD, RN, FAAN** John L. & Helen Kellogg Dean College of Nursing, Rush University
5 – 6:30 p.m. POB, Room 500	**Award Ceremony and Reception** ***Award Presentations*** • Oral Presentation Awards • Poster Awards: *Cancer Research Award, The Health Equity Research Award, The Irwin Press Patient Experience Research Award, RU Trainee Translational Science Award*

Visit the Trainee Research Day webpage for the most up-to-date information.

Awards

Oral Presentation Awards	
Cancer and Translational Medicine	**Darbaz Adnan, MBChB, MS** (RMC: DTS) – **Abstract #** 1 A NOVEL PATIENT-DERIVED ORGANOID-ON-CHIP MODEL FOR PERSONALIZED PANCREATIC CANCER THERAPY
Clinical Practice II: Cohort Studies	**Sierra Broad, DO, MPH** (Clinical Resident) – **Abstract # 59** EXTENT OF RESECTION MATTERS: PARTIAL VS. TOTAL THYMECTOMY AND OVERALL SURVIVAL IN EARLY-STAGE THYMOMA
Clinical Practice III: Medical Education, Patient Experience & Supportive Care	**Kelsey Page, BS** (CHS: MS) – **Abstract # 96** THE EFFECTS OF GLOSSECTOMY ON TONGUE STRENGTH AND SWALLOWING OVER TIME **Ohm Shukla, MS** (RMC: M2) – **Abstract # 99** IMPROVING PEDIATRIC RESUSCITATION AND HANDOFFS USING INTERPROFESSIONAL TRAINING FOR PARAMEDICS AND EM RESIDENTS
Health Equity and Community Engagement	**Aaliyah Ellison-McPeters BS** (CON: MS) – **Abstract # 105** INCLUSIVE HAIRCARE EDUCATION: ADDRESSING HAIR AND SCALP HEALTH INEQUITIES IN PATIENT CARE **Kristen Halko, BSN** (CON: DNP) – **Abstract # 108** A COMPREHENSIVE EVALUATION OF AN APRN-LED PREVENTION CENTER: INVESTIGATING APPOINTMENT ADHERENCE IN LIFESTYLE MEDICINE AND RISK FOR METABOLIC SYNDROME **Eleanor Kraichely, BA** (CHS: MS) – **Abstract # 119** INFLUENCE OF SOCIAL DETERMINANTS OF HEALTH AND RELATED FACTORS ON LANGUAGE RECOVERY IN ADULTS WITH STROKE-INDUCED APHASIA **Kaveh Torabian, MS** (RMC: M3) – **Abstract # 129** EVOLVING TRENDS IN COMMON HAND PROCEDURE UTILIZATION: HOW THE USE OF AMBULATORY SURGICAL CENTERS HAVE IMPACTED DISPARITIES IN CARE
Infectious Diseases and Inflammation	**Yulu Wang, MD** (Post-Doctoral Research Fellow) – **Abstract # 146** ACTIVATION OF KERATINOCYTE AUTOPHAGY IN BULLOUS PEMPHIGOID
Musculoskeletal Research and Orthopedics	**Jun Oike, MD, PhD** (Post-Doctoral Research Fellow) – **Abstract # 165** CMTX-101 IMPROVES BACTERIAL CLEARANCE IN A MOUSE MODEL OF PERIPROSTHETIC JOINT INFECTION
Neurodegenerative Diseases and Inflammation	**Kristy Urquhart, BS** (RMC: DTS) – **Abstract # 189** REMODELING OF THE MENINGEAL EXTRACELLULAR MATRIX IN AGING

Poster Presentation Awards	
Cancer Research Award	TBA
The Health Equity Research	TBA
The Irwin Press Patient Experience Research	TBA
RU Trainee Translational Science Award	TBA

Abstracts

Abstract/Poster #: 1
Session: Oral Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: DTS

Darbaz Adnan, MBChB, MS

Darbaz Adnan1, Natan Roberto de Barros2, Luca S Santovito3, Xuhong Cheng3, Kristi M Lawrence1, Mariah K Barnett1, Martine D Boetto1, Neal Mehta4, Ajaypal Singh4, Lin Cheng5, Xiangsheng Huang3, and Faraz Bishehsari1,3,6 1 Rush Center for Integrated Microbiome and Chronobiology Research, Rush Medical College, Rush University Medical Center, Chicago, USA 2 National Laboratory of Bioscience (LNBio), National Center of Research in Energy and Materials (CNPEM), Campinas, Brazil 3 Gastroenterology Research Center (GRC) - Department of Internal Medicine, University of Texas Health Science Center at Houston, Houston, USA 4 Department of Internal Medicine, Rush University Medical Center, Chicago, USA 5 Department of Pathology, Rush University Medical Center, Chicago, USA 6 MD Anderson Center, UTHealth Houston Graduate School of Biomedical Sciences, Houston, USA

A NOVEL PATIENT-DERIVED ORGANOID-ON-CHIP MODEL FOR PERSONALIZED PANCREATIC CANCER THERAPY

INTRODUCTION: Pancreatic ductal adenocarcinoma (PDAC) has a dismal prognosis and responds poorly to chemotherapy. There is an urgent need for personalized models that capture patient's cancer cells and their microenvironment to guide therapy. We developed a novel ex vivo platform integrating patient-derived tumor organoids with key components of the tumor microenvironment (TME) to better model PDAC and test therapeutic strategies.

METHODS: Tumor biopsies from patients at Rush University were used to establish three-dimensional pancreatic cancer organoids. These organoids that retain features of the original tumor were incorporated into a microfluidic organ-on-a-chip device along with essential TME components, including pancreatic stellate cells (fibroblasts), endothelial cells, and patient-derived immune cells (monocytes and T cells). The two-chamber chip allowed continuous perfusion and a simulated vascular channel. Tumor growth, stromal activation, and immune cell interactions were assessed. Gemcitabine chemotherapy was tested with or without stromal-modulating agents (all-trans retinoic acid and a macrophage inhibitor). We also introduced patient-derived cytotoxic T cells to evaluate anti-tumor immune responses, including the effect of PD-1 checkpoint blockade (pembrolizumab).

RESULTS: Tumor organoids co-cultured with fibroblasts and immune cells on the chip grew more rapidly than organoids alone, demonstrating pro-tumorigenic crosstalk. Co-culture induced fibroblast activation and collagen deposition, mirroring the fibrotic (desmoplastic) stroma characteristic of PDAC. Combining stromal-targeting treatments with gemcitabine significantly increased cancer cell apoptosis compared to chemotherapy alone. Administration of T cells through the vascular channel led to a high T cell infiltration into the tumor compartment. However, in the presence of stromal cells, T cells showed reduced tumor killing, consistent with an immunosuppressive TME. High-dose pembrolizumab (PD-1 blockade) enhanced T cell penetration and restored tumor cell killing.

CONCLUSION: We developed a patient-derived pancreatic cancer-on-a-chip model that recapitulates key tumor-stroma and tumor-immune interactions. Our Chip enables rapid ex vivo testing of therapies in a personalized context. The organoid-on-chip concept shows potential for advancing precision medicine in pancreatic cancer.

Anuoluwa Ayannusi, BS
Anuoluwa E Ayannusi BS (RMC), Shirlene Paul MS (RUMC), Chelsea McPeek RN (RUMC), Dipti Gupta MD (RUMC), Lauren Green MD (RUMC), Mia Levy MD, PhD (RUMC), Lisa Stempel MD (RUMC), Rosalinda Alvarado MD (RUMC), Charita Kunta BS (RUMC)

IS THE TYRER-CUZICK V.8 MODEL AN ACCURATE PREDICTOR OF PATIENT PREFERENCE FOR THE SURGICAL TREATMENT OF BREAST CANCER?

INTRODUCTION: While breast conserving surgery (BCS) is an effective breast cancer treatment, increasing mastectomy rates are observed among BCS-eligible patients. The Tyrer-Cuzick v.8 (TC8) Model predicts an individual's risk of developing breast cancer and thus may be factored into choosing a surgical intervention. Despite the wide-spread use of this risk assessment tool, there is limited research studying the relationship between TC8 scores and patient surgical preference. Thus, this study's objective is to analyze rates of lumpectomy and mastectomy in relation to TC8 scores.

METHODS: This single institution, retrospective study included female patients ages 25-75 who underwent breast cancer surgery at Rush University Medical Center in Chicago, IL from July 2020 to December 2023. Clinical data such as TC8 score and procedure type were extracted from the Epic electronic health record. BCS eligibility was determined via chart review. All patients completed the TC8 risk assessment preoperatively and were categorized as average risk (TC8 score <0.20) or high risk (TC8 score ≥0.20). Chi-squared tests were performed to determine the statistical significance of TC8 score and procedure type.

RESULTS: A total of 592 patients who met our inclusion criteria received surgical treatment from July 2020-December 2023. Of those patients, 98 (16.6%) were categorized as high-risk and 494 (83.4%) were average risk. Patients with an average and high-risk TC8 score were 1.74x and 1.58x more likely to undergo lumpectomy than mastectomy, respectively. Overall, 374 (63.2%) procedures were lumpectomies and 218 (36.8%) were mastectomies. Among the 218 patients who chose mastectomy, 67 (30.7%) were eligible for lumpectomy and 151 (69.3%) were not eligible for lumpectomy. Statistical analysis indicated that there was no significant correlation between TC8 risk category and procedure type ($p>0.05$).

CONCLUSION: Results from this study indicate that patients were more likely to opt for lumpectomy over mastectomy, regardless of their TC8 risk score. While the Tyrer-Cuzick v.8 Model continues to be a reliable tool for calculating breast cancer risk and individualizing screening, our findings suggest that it does not significantly influence patient surgical treatment. Future research should explore connections between the Tyrer-Cuzick v.8 Model, trends in breast cancer treatment, and patient decision-making.

Abstract/Poster #: 3
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: M3

Joseph Engel, BS
Joseph O. Engel (Rush), BS; Micah Rubin, MD (Rush); Ricky Patel, MD (Rush); Joanna J. Choe, BS (Rush); Bulent Arslan, MD (Rush)

PROGNOSTIC PERFORMANCE OF MELD-FAMILY LAB SCORES IN INTRAHEPATIC CHOLANGIOCARCINOMA PATIENTS UNDERGOING Y-90 RADIOEMBOLIZATION

INTRODUCTION: Intrahepatic cholangiocarcinoma (ICC) is an aggressive malignancy with limited systemic options, and Y-90 radioembolization is frequently used for locoregional control. Although prognostic scores exist for cirrhosis, their role in ICC prior to Y-90 remains unclear. Laboratory-based models, including MELD, MELD-Na, and MELD 3.0, are readily available before treatment, but their ability to stratify ICC risk has not been established. We examined whether these scores correlate with liver reserve and adverse tumor characteristics in ICC and whether any model predicts overall survival.

METHODS: We retrospectively reviewed 29 ICC patients who underwent Y-90 mapping angiography between 2012 and 2024. MELD, MELD-Na, and MELD 3.0 scores were calculated from pre-procedure labs. Correlations between these scores and liver function (albumin, INR, bilirubin, Child-Pugh) were examined. Their ability to distinguish portal vein invasion and disease distribution (left vs. right, segmental) was assessed using AUC. Overall survival from mapping to death or last follow-up was evaluated by concordance indices and Kaplan-Meier analyses. IRB approval was obtained.

RESULTS: MELD-family scores reflected expected variation in hepatic function-higher values aligned with worse bilirubin, INR, albumin, and Child-Pugh status. Patients with portal vein invasion tended to have higher MELD-Na and MELD 3.0 scores, and these models modestly separated those with versus without invasion (AUC ~0.76-0.78), consistent with more aggressive disease occurring alongside impaired liver reserve. Similarly, patients with left-lobar involvement exhibited higher MELD scores than those without. For overall survival, MELD-Na showed the strongest stratification (C-index ≈0.65), with Kaplan-Meier curves demonstrating stepwise separation. Accordingly, higher MELD-Na values corresponded to shorter survival and greater mortality risk. Early mortality estimates were limited by low event counts.

CONCLUSION: Routinely obtained lab scores, especially MELD-Na, have prognostic value in ICC patients undergoing Y-90. MELD-Na modestly distinguished adverse tumor features and best predicted survival. These findings support using MELD-Na for pre-procedural risk counseling in ICC, with higher values indicating worse outcomes. Larger studies are needed to validate these results and determine risk thresholds.

Abstract/Poster #: 4
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: DTS

Kayla Gant, BS
Kayla Gant (Rush), Shreya Patel (Caris Life Sciences), Marcus Winogradzki (Rush) and Jitesh Pratap(Rush)

THE NOVEL ROLE OF B-TUBULIN II AND III IN BREAST CANCER BONE METASTASIS

INTRODUCTION: Metastatic progression in breast cancer depends on dynamic interactions between tumor cells and the extracellular matrix (ECM), allowing detachment from the primary site, migration, and colonization of distant organs. These processes are regulated by integrins and focal adhesion complexes that connect the ECM to the cytoskeleton through focal adhesion kinase (FAK) and Src signaling pathways. Microtubules further contribute by coordinating focal adhesion turnover, cell polarity, and directional migration; however, the role of β-tubulin isotypes in adhesion control remains poorly defined. This study investigates how β-tubulin II (TUBB2A) and β-tubulin III (TUBB3) regulate focal adhesion dynamics, microtubule organization, and metastatic behavior in bone-derived breast cancer cells. We hypothesize that β-tubulin isotypes establish a bone metastasis-specific "tubulin code" that stabilizes microtubules and promotes metastatic properties, and that disruption of TUBB3 alters integrin-mediated adhesion to the ECM.

METHODS: Public RNA-Seq datasets and patient survival data were analyzed to assess clinical correlations. Immunohistochemistry was performed on matched primary and bone metastatic breast cancer biopsies (n = 16). CRISPR/Cas9 knockdown of TUBB2A and TUBB3 was generated in bone-derived MDA-MB-231 cells and validated by western blotting and genomic sequencing. Metastatic properties were assessed through functional assays that included adhesion, migration, and invasion. Protein analysis of integrin and focal adhesion complex proteins was assessed by western blots. Statistical analysis used unpaired t-tests with significance defined as $p < 0.05$.

RESULTS: TUBB3 disruption altered adhesion relative to controls in an ECM-dependent manner. Reduced attachment was observed on uncoated plastic at higher density, while adhesion to collagen and fibronectin varied by surface and incubation time. TUBB2A knockdown frequently increased adhesion on ECM-coated substrates. Both knockdowns altered migration and invasion, consistent with dysregulated focal adhesion dynamics. Loss of TUBB3 correlated with reduced β-tubulin protein levels and impaired adhesion efficiency. Ongoing sequencing confirms gene disruption and Western blot validates protein depletion.

CONCLUSION: Elevated TUBB2A and TUBB3 expression correlates with reduced patient survival. Knockdown of either isotype disrupts adhesion and metastatic behavior, with TUBB3 loss associated with decreased focal adhesion protein expression. These findings support a regulatory role for β-tubulin isotypes in bone metastatic progression and identify TUBB3 as a potential therapeutic target.

Allie Heller, MS
Allie Heller(1,2), Amanda Marzo(2), Jeffrey Schneider(1) (1) Rush University Medical Center, Department of Molecular Pathogens and Immunity (2) Rush University Medical Center, Department of Internal Medicine, Division of Hematology, Oncology, and Cellular Therapy

REMOVAL OF SIALIC ACID FROM 4T1 TUMOR CELLS LEADS TO ALTERNATIVE TUMORIGENESIS FATES IN A MOUSE MODEL OF TRIPLE-NEGATIVE BREAST CANCER

INTRODUCTION: Triple-negative breast cancer (TNBC) is an aggressive form lacking estrogen, progesterone, and HER2 receptors. The standard of care for patients is chemotherapy, radiation, and immunotherapy, however, 60-80% do not achieve complete responses, often attributed to the lack of cytotoxic lymphocytic infiltrates (CTL) into the tumor microenvironment (TME). Another driver of therapeutic resistance in TNBC is sialic acid (SA) overexpression, a cell surface glycan, adding immuno-evasive complexity. Alternatively, subsets of hyposialylated TNBC cells contribute to metastatic seeding and stem-like quiescence. Current immunotherapies targeting SA in TNBC may not address alternative metastatic fates, limiting therapeutic value. We hypothesize that reducing SA on TNBC tumor cells will lead to reduced tumor progression, and allows for investigation of mechanistic roles of SA in the TME to characterize therapeutic responses.

METHODS: 1.0 x 10^6 4T1 TNBC cells treated with 100mU Neuraminidase enzyme were validated for desialylation via lectin flow cytometry after 1 hour, and again at 24, 48, and 72h post treatment. A mouse tumor model was established by injecting 2.5x10^5 wild-type or desialylated 4T1-Luc cells into the mammary fat pad of BALB/C mice (N=6). When tumors established, combination immunotherapy was administered with two i.t. IL-15/IL-15Ra-Fc and five i.p. α-PD-1 injections every 4 days to expand CTL populations. Tumor progression and metastasis were measured via caliper measurements and IVIS for 30 days.

RESULTS: SNA expression in TNBC cells restores to untreated levels <48 hours in vitro, demonstrating that enzymatic desialylation is short-lived. When desialylated 4T1 mouse tumors are treated with IL-15/anti-PD-1, a therapeutic window of response is revealed around 9 days post-tumor establishment, but is not sustained. Alternative tumorigenesis fates such as reduced progression (N=4), metastasis (N=1), and no evidence of tumor after 30 days (N=1) were demonstrated in vivo.

CONCLUSION: Short-acting effects of desialylation occur with distinct in vitro and in vivo timelines suggest it is vital to establish a "therapeutic window" to target SA to facilitate tumor reduction and initiate immunotherapy responses. These results provide further insight on the dual-fate of sialylation: either initial tumor regression or induction of metastasis, and rapid progression upon termination of immunotherapy if the SA status on the tumor cells remains unbalanced.

Abstract/Poster #: 6
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: M2

Angie Jung, BS
Angie Jung (Rush); Yuan Shao (Rush); Nathaniel Camden (Rush); Thomas Kim (Rush)

NOVEL ACCELERATED PARTIAL BREAST IRRADIATION SIMULTANEOUS INTEGRATED BOOST TECHNIQUE - RUSH EXPERIENCE

INTRODUCTION: Breast cancer is the most common malignancy among U.S. women. Radiation therapy after lumpectomy reduces recurrence but requires multiple sessions, creating barriers related to time, access, and cost. Newer approaches of shorter fractionation schedules aim to maintain efficacy while minimizing treatment burden and side effects. Accelerated partial breast irradiation (APBI) with simultaneous integrated boost (SIB) delivers higher doses to the tumor bed in fewer treatments, improving convenience without compromising local control. However, guidelines of the American Society for Radiation Oncology (ASTRO) are limited by underrepresentation of patients with higher-risk clinical or pathologic features in major trials. Real-world data are needed to better define APBI candidacy for these groups.

METHODS: This retrospective cohort study evaluates patients treated with 5-fraction APBI with SIB at Rush University Medical Center between March 2023 and July 2025. Eligible patients are aged ≥18 years with stage I-II invasive ductal carcinoma (IDC) or ductal carcinoma in situ (DCIS) who underwent breast-conserving surgery followed by a 5-fraction regimen. Exclusions are metastatic disease at diagnosis, or incomplete records. Patients are grouped per ASTRO APBI categories ("recommended," "conditionally recommended," and "conditionally not recommended"). Collected variables include tumor features, surgical details, systemic therapy, radiation parameters, and acute toxicity.

RESULTS: Current evidence shows APBI provides comparable toxicity across diverse patient subgroups while reducing overall treatment time and maintaining local control. SIB delivery appears feasible and safe, with potential benefit for patients with higher-risk features. As of December 2025, our cohort includes 87 patients with a median follow-up of 327 days. Of these, 54 patients had IDC and 33 had DCIS. According to ASTRO criteria, 54 patients were "recommended," 31 "conditionally recommended," and 2 "conditionally not recommended." Two local recurrences occurred, both in the "recommended" category. No significant differences in acute toxicities were observed among risk groups, though longer follow-up is needed.

CONCLUSION: This study provides real-world evidence on outcomes of 5-fraction APBI with SIB, particularly among patients historically underrepresented in clinical trials. Findings will help refine selection criteria, clarify safety in higher-risk groups, and support more individualized and accessible radiation therapy strategies for early-stage breast cancer.

Abstract/Poster #: 7
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: M2

Brendan King, BA
First author: Brendan King Last author: Dr. Matthew Dixon

OVERALL SURVIVAL OF PATIENTS WITH PANCREATIC ADENOCARCINOMA WHO EXHIBITED A COMPLETE PATHOLOGIC RESPONSE TO NEOADJUVANT CHEMOTHERAPY

INTRODUCTION: Pancreatic cancer has a high mortality rate, with a 5-year survival of 12.8%. Though this is low, advancements in cancer therapies have raised the 5-year survival rate from 3.2% in 1975. One such development is the use of chemotherapy before surgical intervention, neoadjuvant chemotherapy (NAT). NAT aims to shrink the primary tumor to provide for a higher likelihood of negative margins on resection. In some cases, post-surgical pathology shows that NAT has completely destroyed the primary tumor, a complete pathologic response (pCR). This descriptive study aims to compare the overall survival of patients who exhibited a pCR to NAT to those patients who exhibited an incomplete pathologic response (pIR).

METHODS: We utilized the national cancer database as our patient population. To be included in the study, patients must have fit the following criteria: diagnosed with pancreatic adenocarcinoma supported by histology, have been treated with a Whipple procedure, distal or complete pancreatectomy, have been treated with neoadjuvant chemotherapy, have a Charlson-Dayo comorbidity score less than 3, not have been treated with immunotherapies, and have survived at least 90 days post-operative. This yielded a population of 9909 patients. Patients were separated into cohorts of pCR (n = 517) and pIR (n = 9392) and survival was compared via a Kaplan Meier curve in the program SPSS.

RESULTS: The analysis showed that at 5 years, the pCR cohort exhibited a 58.1% survival rate, compared to 26.8% in the pIR cohort. Similarly, the median overall survival for the pCR cohort was 83.88 months compared to 30.82 for the pIR cohort. A Log Rank analysis shows a p-value of < .001. Log Rank analysis showed no attrition bias between the two cohorts.

CONCLUSIONS: Our analyses show that patients that exhibit a pCR to neoadjuvant chemotherapy have markedly increased survival compared to those that do not. This correlation is physiologically logical, as a pCR is indicative of a stronger sensitivity of a patient's disease to chemotherapy. This descriptive study lays the foundation for a follow-up study comparing survival of pCR who are or are not subsequently treated with adjuvant chemotherapy.

Claudia Lasalle, BA
Claudia Lasalle* (Department of Dermatology, Rush University Medical Center); Maria Morales (Department of Dermatology, Rush University Medical Center); Yulu Wang (Department of Dermatology, Rush University Medical Center); Kyle Amber (Department of Dermatology, Rush University Medical Center); Adrian Mansini (Department of Dermatology, Department of Urology, Rush University Medical Center) *Presenting author

AR-B7-H3 AXIS IN MELANOMA IMMUNE RESISTANCE, METASTASIS, AND SEX DIFFERENCES

INTRODUCTION: The androgen receptor (AR), extensively studied in prostate cancer, is largely unexplored in melanoma. Few reports have described AR expression in melanoma cell lines, and its clinical significance remains unclear. Male patients more frequently present with aggressive, metastatic melanoma and respond less to immune checkpoint blockade (ICB), suggesting that androgen signaling may contribute to sex-related disparities in immune resistance. B7-H3 (CD276), an immune checkpoint molecule, marks "armored-cold" tumors with poor T-cell infiltration and worse outcomes. Here, we hypothesized that AR activity may shape an immune-cold phenotype in melanoma by regulating B7-H3, thereby contributing to sex-associated differences in clinical behavior and ICB response.

METHODS: Clinical and transcriptomic data from Skin Cutaneous Melanoma (TCGA-SKCM, n=353) were analyzed to examine relationships between AR and B7-H3 expression, stage, and survival. The predictive value of B7-H3 expression for immunotherapy response was evaluated using the Kaplan-Meier plotter database. AR and B7-H3 protein levels were assessed by immunoblotting using melanoma cell lines. AR activity was pharmacologically modulated with the agonist R1881 and the antagonist enzalutamide, and effects on B7-H3, proliferation, migration, and invasion were assessed.

RESULTS: High AR expression was associated with worse survival and higher metastatic risk. AR transcripts were positively correlated with B7-H3, and higher B7-H3 was associated with reduced immune infiltration and predicted poorer progression-free survival (PFS) in patients. Most melanoma cell lines co-expressed AR and B7-H3, whereas AR-negative lines lacked B7-H3. Activation of AR increased B7-H3 levels and promoted proliferative and invasive behavior; conversely, AR antagonism reduced B7-H3 and suppressed metastatic traits, indicating a mechanistic AR-B7-H3 axis that may explain sex-specific vulnerability to aggressive, treatment-resistant melanoma.

CONCLUSION: These findings support a functional AR-B7-H3 axis connecting androgen signaling to immune evasion and tumor aggressiveness in melanoma. By emphasizing a biologically grounded pathway at the intersection of sex, hormones, and immune escape, this work positions AR as a possible contributor to male-female disparities in outcomes. Therapeutic AR blockade may complement ICB to slow disease progression, improve response rates, and reduce sex-related disparities. These hypotheses are being further tested in patient-derived and in vivo models, including an evaluation of soluble B7-H3 as a biomarker of ICB resistance.

Abstract/Poster #: 9
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: DTS

Malia Leifheit, BS in Health Science and Biology, MS in Integrated Biomedical Sciences
Malia E Leifheit (Rush University), Preston Daniels (Rush University), Noah T King (Rush University), Amanda L. Marzo (Rush University)

INTRATUMORAL HEPLISAV-B VACCINE, COMBINED WITH IL-15 COMPLEXES AND ANTI-PD1, INDUCES COMPLETE TUMOR REGRESSION AND ESTABLISHES LONG-TERM TUMOR IMMUNITY TRIPLE NEGATIVE BREST CANCER.

INTRODUCTION: Triple negative breast cancer (TNBC) is a disease with limited treatment options and a poor prognosis, highlighting an urgent need for therapeutic strategies to improve outcomes. Immune checkpoint blockade (ICB) with a PD-1 inhibitor has been an attractive strategy for TNBC treatment; however, the "immune-excluded" tumor microenvironment (TME) often confers resistance. Therefore, a creative solution is needed to turn the immunosuppressive TME into an "immune-inflamed" one with robust CD8+ T cell activity and infiltration. In this study, we determined whether combining IL-15 complexes alone, anti-PD-1 alone, or IL-15 complexes and anti-PD-1 together, with the HEPLISAV-B (HEP B) vaccine, administered intratumorally (i.t.), would enhance tumor immunity in an established 4T1 breast cancer model.

METHODS: For this study female BALB/c mice were injected in the right mammary fat pad with the 4T1-luciferase expressing TNBC cell line, and once tumors developed, either a single dose of HEP-B vaccine or three serial doses of HEP B vaccine was administered i.t., followed by two i.t. injections of IL-15 complexes alone, five doses of anti-PD1 alone (i.p.), or a combination of both IL-15 complexes and anti-PD1 and tumor growth and survival were monitored over 60 days. Tumors were measured using calipers and IVIS imaging.

RESULTS: We show that, compared with control mice receiving PBS, a single i.t. dose of HEP B induces complete tumor regression in 60% of mice. When HEP B was used with IL-15 complexes and α-PD1, 80% of mice remained tumor-free. Furthermore, when HEP B was combined with IL-15 complexes and α-PD1, tumors regressed and did not recur. CXCL9 expression was downregulated on CD8 T cells in the tumors of mice treated with HEP B alone or with IL-15 and α-PD-1, while CXCR4 was increased.

CONCLUSION: Our findings indicate that the HEP B vaccine in combination with IL-15 is an attractive strategy to overcome immune checkpoint inhibitor resistance when added to αPD-1 treatment in TNBC.

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NUTRACEUTICAL INTERVENTIONS FOR SKIN CANCER PREVENTION: A SYSTEMATIC REVIEW OF CLINICAL EVIDENCE

INTRODUCTION: Skin cancer incidence continues to rise globally, while prevention strategies relying on photoprotection and early detection remain inconsistently implemented. Interest has increased in nutraceuticals as an adjunctive chemoprevention. Although nicotinamide and other supplements are widely used, evidence supporting their role in preventing keratinocyte carcinoma, melanoma, or actinic keratoses (AKs) remains unclear. This study evaluated the clinical efficacy and safety of nutraceutical interventions for skin cancer prevention.

METHODS: A systematic review following PRISMA 2020 guidelines was conducted (PROSPERO CRD420251127381). Searches were completed in April 2025 across PubMed/MEDLINE, Embase, Scopus, Cochrane CENTRAL, CINAHL, and Google Scholar. Eligible studies included randomized trials, quasi-experimental studies, and observational cohorts of oral or topical nutraceuticals for keratinocyte carcinoma, melanoma, or AK outcomes. Data were independently extracted and included study characteristics, interventions, effect measures, and adverse events. Risk of bias was assessed using Joanna Briggs Institute tools. Only published literature was analyzed; institutional review board approval was not required.

RESULTS: From 5,716 records, 22 studies (3,048 participants; sample sizes 1-2,259) met inclusion criteria. Nicotinamide was the most frequently studied agent. Across randomized trials, nicotinamide 500 mg twice daily produced a 13% reduction in AKs compared with placebo (rate ratio, 0.87; 95% CI, 0.78-0.96) but showed mixed effects on keratinocyte carcinomas: one large trial found no difference (risk ratio [RR], 1.00; 95% CI, 0.80-1.30), while another reported modest benefit (RR, 0.77; 95% CI, 0.62-0.96). Evidence for AK recurrence and progression to squamous cell carcinoma was inconsistent (24%-43%). Other nutraceuticals, including omega-3 fatty acids, selenium, and antioxidant combinations, showed heterogeneous or null associations (RRs 0.33-1.12). Melanoma outcomes showed no significant differences. Adverse events were infrequent, mild, and comparable to controls. Overall certainty was limited by variability in dosing, duration, and population risk.

CONCLUSION: Nicotinamide provides short-term reductions in AKs, but its effectiveness in preventing keratinocyte carcinomas remains uncertain, and evidence for other nutraceuticals does not support chemopreventive benefit. Current data do not support nutraceuticals as evidence-based chemoprevention. Larger, long-term trials in high-risk populations are needed to clarify their role in skin cancer prevention.

Abstract/Poster #: 11
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: DTS

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SCLC CELLS WITH NEUROD1 AND MYC CO-EXPRESSION ARE SENSITIVE TO THE COMBINED INHIBITION OF AURKB AND KMT5C

INTRODUCTION: Small cell lung carcinoma (SCLC) is an aggressive cancer with a 5-year survival of less than 10%. Recently, subtypes of SCLC have been identified with different key transcription factor expression (NEUROD1, ASCL1, and POU2F3). The NEUROD1 subtype (SCLC-N) is associated with high MYC expression and sensitivity to AURK inhibition. KMT5C is a histone methyltransferase associated with genomic stability and is oncogenic in multiple cancers. Our lab has shown that the combination of Barasertib (AURKB inhibitor) and A196 (KMT5C inhibitor) is synergistically lethal in multiple cancer cell types. Hypothesis: The combination of AURKB and KMT5C inhibitors is synergistically lethal to SCLC-N cells and tumors.

METHODS: In-vitro: SCLC cell lines were treated for 3d with Barasertib (0-200nM) alone or in combination with A196 (10uM). MTT viability assay was evaluated by ANOVA and Tukey's HSD. In-vivo: NEUROD1+/MYC+ cells were inoculated in the flank of immune-deficient mice. Treatment with vehicle, Barasertib (20mg/kg), and/or A196 (75mg/kg) began when tumors became palpable. Intraperitoneal injections were done 5d/week for 6 weeks. Tumor volume was evaluated via linear regression, survival, and ANOVA.

RESULTS: In-vitro: The 10nM and 20nM Barasertib combination treatments significantly reduced viability in NEUROD1+/MYC+ cells when compared to the vehicle or individual drugs alone. ASCL1+ and NEUROD+/MYC- cells had little to no sensitivity to either drug or the combination. In-vivo: A196 alone had little to no effect on tumor growth compared to the vehicle, while Barasertib alone had a significant increase in overall survival compared to the vehicle and A196. B+A had significantly enhanced overall survival compared to all group.

CONCLUSIONS: In addition to chemo/radiation, immunotherapy is often used clinically to treat SCLC. However, enhanced survival is seen only in a handful of patients. As such, there exists a need for new therapeutic targets and improved approaches. Barasertib is in clinical trials with disease stability seen in ~45% of cases, and A196 has pre-clinical results demonstrating its efficacy in enhancing ICB therapy in NSCLC. Furthermore, we have shown the combination of B+A has synergistic lethality in NSCLC and TNBC cells. Altogether, this combination therapy could reduce tumor cell growth and prolong SCLC-N patient survival.

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INTRATUMORAL HEP B VACCINE, COMBINED WITH IL-15 COMPLEXES AND ANTI-PD1, INDUCES COMPLETE TUMOR REGRESSION AND ESTABLISHES LONG-TERM TUMOR IMMUNITY IN YOUNG AND AGED RECIPIENTS.

INTRODUCTION: As we age, the adaptive immune system declines due to factors such as reduced thymic cellularity, altered tissue architecture, decreased production of naïve T cells, and a limited repertoire of peripheral T cell receptors. Yet, most preclinical tumor models rely on young mice, overlooking the immunological decline that shapes therapeutic outcomes in older hosts. This gap limits translation of otherwise promising immunotherapies to the aging cancer population. To address this, we examined how age influences antitumor immunity and immune cell trafficking in a triple-negative breast cancer (TNBC) model treated with either intratumoral (i.t.) HEPLISAV-B (HEP B) vaccine or a combinatorial immunotherapy composed of i.t. HEP B vaccine, i.t. complexed IL-15, and intraperitoneal (i.p.) anti-PD-1. We hypothesized that treatment could reverse the effects of aging on tumorigenesis.

METHODS: The TNBC cell line 4T1 expressing luciferase was used to establish tumors in young (6-8 weeks) and aged (24-26 weeks) female BALB/c mice. Mice were treated with i.t. injections of the HEP B vaccine or Hep B in combination with i.t. injections of IL-15 and i.p. injections of anti-PD-1. Tumor progression and survival were monitored. Flow cytometry quantified expression of trafficking receptors (CXCR4, B7).

RESULTS: The HEP B vaccine and combination therapy induced complete tumor regression in 90% of young mice recipients (n=10) and 60% of aged mice (n=9) in a survival study out to 60 days. Aged mice showed faster tumor growth in controls but similar regression rates when treated. Aging altered the expression of key homing molecules on tumor-infiltrating CD8 T cells with decreased CXCR4 and elevated B7, suggesting impaired trafficking and retention. Changes in the CD4:CD8 T cell ratio were observed between groups.

CONCLUSION: Treatment with the HEP B vaccine or a combination therapy can overcome age-related hurdles in tumor regression.

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ROLE OF KEAP1 IN REGULATING RESPONSE TO KRAS-G12C INHIBITION IN NSCLC

INTRODUCTION: Non-small cell lung cancer (NSCLC) comprises ~85% of all lung cancers. Oncogenic KRAS mutations occur in ~25-30% of NSCLCs. Covalent inhibitors can target the KRAS-G12C variant, comprising ~12-15% of KRAS-mutant NSCLCs. Two FDA-approved KRAS-G12C inhibitors, sotorasib (AMG-510) and adagrasib (MRTX-849), have shown clinical response rates of ~37% and 43%, respectively. KEAP1 (Kelch-like ECH-associated protein 1) gene is a key negative regulator of the NRF2 antioxidant response pathway. KEAP1 loss-of-function mutations or deletions in ~15-20% of KRAS-mutant NSCLCs cause constitutive NRF2 activation and promote oxidative stress resistance, metabolic reprogramming, and therapy resistance. KRAS-G12C/KEAP1 co-mutated tumors show resistance to KRAS-G12C inhibitors. Elucidating how KEAP1 loss modulates the response to KRAS-G12C inhibition is therefore of both mechanistic and translational importance.

METHODS: Lentiviral shRNA targeting KEAP1 was used to knock down KEAP1 expression in three KRAS-G12C/KEAP1 wild-type NSCLC cell lines. Control and KEAP1-knockdown cells were evaluated for sensitivity to AMG-510 and MRTX-849. qPCR, immunoblotting, and RNA sequencing were performed to assess pathway alterations induced by KEAP1 loss relative to control cells. Genetic and pharmacological perturbations were used to analyze pathway changes affecting KRAS-G12C inhibitor response.

RESULTS: KEAP1 knockdown in KRAS-G12C NSCLC cell lines (Calu-1, H358, and H1373) significantly increased cell survival in colony formation assays following treatment with AMG-510 and MRTX-849, compared to control cells. RNA sequencing of Calu-1 control and KEAP1 knockdown cells revealed enrichment of NRF2, NOTCH, and polyamine metabolism pathways. Immunoblot analysis confirmed elevated expression of NRF2, PD-L1, and phosphorylated AKT in KEAP1 knockdown Calu-1 cells relative to controls. Treatment with AMG-510 suppressed phospho-ERK and downregulated PD-L1 in both control and KEAP1 knockdown cells. However, AMG-510 inhibited phospho-AKT only in control cells, while KEAP1 knockdown cells largely maintained PD-L1 and phospho-AKT levels.

CONCLUSION: Wild-type KEAP1 mediates the response to KRAS-G12C inhibitors by suppressing NRF2, NOTCH, polyamine metabolism, and PD-L1-AKT-associated adaptive resistance pathways in KRAS-G12C mutant NSCLC cells.

Abstract/Poster #: 14
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: M1

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AMP-ACTIVATED PROTEIN KINASE ALPHA (AMPK-α) AGONIST ATTENUATES THE TRIPLE NEGATIVE BREAST CANCER CELLS (4T1) ACTIVITIES IN MICE TIBIAL BONE

INTRODUCTION: No preventative therapy currently exists for bone metastasis. AMP-activated protein kinase (AMPK) regulates cellular energy homeostasis and has been implicated in bone remodeling and tumor cell metabolism. We hypothesized that pre-treatment with an AMPK-α agonist could prevent tumor-induced bone mass density (BMD) loss and associated cancer pain.

METHODS: Following IACUC approval CD1 female mice (age 5 ± 1 weeks, weight 18.9 ± 1.0g) were acclimated and trained to run on the rotarod. Mice were then divided into three groups (n=5 each): Group I 4T1 cancer cells + vehicle, Group II 4T1 cancer cells + AMPK-α agonist, and Group III sham + vehicle. AMPK-α agonist (200 mg/kg) or vehicle were administered by oral gavage for 21 consecutive days. Five days after initiation of treatments, 5×10^5 4T1 cells or sham injection of cell culture media were inoculated into the left proximal tibia, with the contralateral tibia serving as an internal control; one vehicle-treated mouse died after injection. BMD was quantified via DEXA scan (KUBTEC Faxitron) at weeks 2 and 4 post-inoculation. Pain behaviors were assessed weekly: mechanical allodynia (von Frey), spontaneous activity (rearing/grooming), motor coordination (rotarod), and limb edema (calipers). Data were analyzed using parametric tests including independent sample t tests (GraphPad Prism).

RESULTS: At 2 weeks BMD (g/cm^2, mean ± SEM) was significantly higher in AMPK-α agonist-treated mice (0.030 ± 0.0033, n=5) compared to vehicle controls (0.018 ± 0.0039, n=4, p=0.048), approaching sham-injected animals (0.038 ± 0.0044, n=5). At 4 weeks, BMD was not significantly different between groups (AMPK-α agonist 0.026 ± 0.0055 vs. vehicle: 0.037 ± 0.0042, p = 0.17; sham: 0.044 ± 0.0028). AMPK-α agonist treated mice showed reduced mechanical allodynia at week 4 (50% paw withdrawal threshold cumulative AUC: AMPK-α agonist 120 ± 7.69 g vs. vehicle 51 ± 3.40 g, p < 0.0001; Sham 117 ± 16.2 g).

CONCLUSION" Pre-treatment with an AMPK-α agonist attenuated early tumor-induced bone loss and produced sustained analgesia. The AMPK-α agonist protected against BMD reduction at 2 weeks and reduced mechanical hypersensitivity throughout the 4-week study. These findings suggest AMPK activation as a potential prophylactic strategy for bone metastasis.

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CHEMOTHERAPY IN DIEP FLAP RECONSTRUCTION: DOES TIMING COUNT?

INTRODUCTION : As breast cancer prevalence has risen, so has the need for breast reconstruction surgery. While alloplastic reconstruction remains popular, the demand for autologous reconstruction, such as Deep Inferior Epigastric Perforator (DIEP) flaps, continues to increase. The timing of DIEP reconstruction varies; however, most patients wait until after chemotherapy and/or radiation. This study aims to identify trends in chemotherapy timing among patients undergoing DIEP flap reconstruction and to evaluate their impact on postoperative outcomes.

METHODS: This IRB approved retrospective study included patients who underwent DIEP flap reconstruction surgery at Rush University Medical Center from 2015-2024. A total of 193 patients met inclusion criteria. Demographic information as well as breast cancer treatment details were collected. Patients were categorized into groups based on intervals between chemotherapy and DIEP flap reconstruction, and their post-operative complications were compared.

RESULTS: Of the 193 patients included in the study, 58 (30.1%) underwent neoadjuvant chemotherapy and 48 (24.9%) got adjuvant chemotherapy. Among neoadjuvant patients, 6 finished treatment ≤ 200 days before DIEP reconstruction, 8 finished 201-300 days before, 17 finished 301-400 days before, and 27 finished >400 days before the DIEP. In the adjuvant group, 15 patients completed the chemotherapy ≤ 200 days before the surgery, 4 completed it 201-300 days prior, 9 completed it 301-400 days before, and 20 patients completed it >400 days before. On statistical analysis, longer adjuvant and neoadjuvant chemotherapy-to-DIEP intervals were not associated with increased risk for post-operative complications such as arterial/venous thrombosis, pneumonia, atelectasis, gastrointestinal or cardiac events. There were also no associations for donor site complications like umbilical necrosis, hematoma, seroma, infection, abscess, or delayed wound healing. The only donor-site outcome that differed significantly by timing was abdominal pain (p=0.016). Patients who underwent reconstruction >400 days after completing neoadjuvant chemotherapy had high rates of abdominal pain (42.3%).

CONCLUSION: Patients undergo DIEP flap reconstruction at varying intervals following chemotherapy. Overall, post-operative complications rates were not significantly affected by the time elapsed between chemotherapy and reconstruction, except for abdominal pain, which increased with time. These findings support the safety of DIEP flap reconstruction at any point after chemotherapy completion.

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TRANSCRIPTIONAL CHARACTERIZATION OF THE TUMOR MICROENVIRONMENT IN REGRESSING TNBC USING VACCINE-PRIMED IMMUNOTHERAPY

INTRODUCTION: In the United States in 2024, there were an estimated 310,720 new diagnoses of invasive breast cancer, and 42,250 deaths caused by the disease. It is the second-highest cancer killer in the country, and a woman in the US has a 2.3% overall chance of dying from the disease. Even deadlier is triple-negative breast cancer (TNBC), a subtype of breast cancer that has lost expression of key surface proteins and has higher mortality rates at all stages of the disease. Recent advances in immunotherapy have reached the clinic, with many patients achieving favorable outcomes from treatments such as anti-PD-1 therapy and cytokine therapies. Treatments such as this are most effective in patients with a tumor microenvironment (TME) compatible with these immunotherapies and may not induce a patient response. However, stimulating the TME with agents such as vaccines may be a promising approach to prime tumors for immunotherapy. Our previous work in a 4T1 mouse TNBC model found that intratumoral administration of the HEPLISAV-b vaccine is effective at eliminating early tumors. Following this treatment with intratumoral IL-15/receptor heterodimer (hetIL-15) and systemic therapy with monoclonal antibodies to programmed death 1 (anti-PD-1), TNBC control and prevention of tumor recurrences were even more effective. Our current work seeks to characterize transcriptional changes in the TME of these regressing tumors in response to intratumoral vaccination, to understand the mechanisms that contribute to cancer immunity.

METHODS: Using single-cell RNA sequencing (scRNAseq) on tumor homogenates, we characterized immune subsets and isolated individual populations to investigate differentially expressed genes that may drive the immune response.

RESULTS: We found that vaccinated mice had responses that favored increased antigen presentation and a reduction in immunosuppression. In addition, multiple transcripts involved in B cell receptor signaling and antibody production were strongly upregulated in cytotoxic T cells and NK cells. Notably, memory T cells also upregulated CXCL13, a characteristic that was previously reported to be associated with a favorable patient response to anti-PD-1 therapy in female patients with lung cancer.

CONCLUSION: These data help provide insight into how this vaccine interacts with the TME, and how it can prepare it to better respond to immunotherapy.

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CESIUM-131 BRACHYTHERAPY FOR CENTRAL NERVOUS SYSTEM SALVAGE THERAPY

INTRODUCTION: Central nervous system (CNS) tumors that recur following initial stereotactic radiosurgery (SRS) present a significant clinical challenge. Treatment following recurrence (salvage therapy) may involve repeat SRS but is subject to increased risk of radiation necrosis. Cesium-131 (Cs-131) brachytherapy offers an alternative approach, using seeds embedded in a collagen tile to deliver high-dose radiation to the tumor following surgical resection. We report a single institution's experience with this novel modality.

METHODS: Patients salvaged with Cs-131 brachytherapy following prior SRS were retrospectively reviewed. Data were retrieved from electronic medical and radiation therapy records. Descriptive analyses and toxicity outcomes were evaluated with R v4.3.2. Local failure was defined as new nodular or contrast-enhancing lesions within the resection cavity on magnetic resonance imaging with multidisciplinary evaluation. Kaplan-Meier analyses were conducted to determine overall survival (OS) and local control.

RESULTS: Twenty-one patients (24 resection cavities) were reviewed. Five (23.8%) primary CNS tumors were observed. Remaining lesions were metastases to the brain, most prominently non-small cell lung cancer (34.7%) and invasive ductal cell carcinoma of the breast (13%). The mean maximum pre-operative tumor diameter was 2.89 cm (0.9-5.5). The mean number of tiles prescribed and used was 5.63 (3-12) and 4 (1-8.5) tiles. Sixteen cavities achieved gross-total resection (GTR). Of these, 100% demonstrated local control over a median follow-up of 12 months. Of the 6 cases with subtotal resection (STR), the median time to failure was 6 months. Overall survival (OS) and local failure at 1 year were 70.8% and 10.2%, respectively, in patients with metastatic lesions. Two failures were from metastatic squamous cell carcinoma of the skin; both failed before the 6-month follow-up. Remaining failures were 1 atypical meningioma (<3 months), 1 ependymoma (<9 months), and 1 glioblastoma (<3 months). Post-operative complications, including cerebrospinal fluid leak, subarachnoid hemorrhage secondary to vasospasm, and post-craniotomy infection with osteomyelitis, occurred in 4 patients (19.0%). 1 patient exhibited symptomatic radiation necrosis (4.2%).

CONCLUSION: Salvage therapy with Cs-131 offers promising local control, high rates of OS, and a favorable safety profile in the setting of recurrence following prior SRS. Its utility may be greatest for patients with recurrent metastatic lesions, especially following GTR.

Abstract/Poster #: 18
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: CON: DNP

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NEURO-ONCOLOGY SURVIVORSHIP: INCREASING SUPPORTIVE ONCOLOGY ACCESS FOR NEWLY DIAGNOSED BRAIN TUMOR PATIENTS

INTRODUCTION: Survivorship follows a patient from diagnosis, through treatment and life after treatment. Approximately 1 million persons in the United States are living with a brain tumor diagnosis and 25,000 people will be diagnosed with a high-grade brain tumor in 2025. High grade brain tumors have a 5-year survival rate of 35%. Due to the overwhelming nature of this diagnosis anxiety and distress are often elevated, reducing quality of life. With limited survival data for the Neuro-Oncology population, early access to care is imperative. Through implementation of distress screenings and awareness of supportive oncology services anxiety and distress can be reduced.

METHOD: New brain tumor patients establishing care at Rush MD Anderson Cancer Center were screened with the NCCN-DT. Sample included newly diagnosed brain tumors, aged 18-99 years. Implementation included a 60-minute presentation with staff, updating new patient calls, completing distress screenings, updating new patient folders, and speaking with patients about supportive services during visits. Evaluation of project included measure of staff attendance. Total number of new patients who established care, distress screenings completed, new patient folders distributed, referrals placed to primary care providers and supportive oncology. Distress screenings utilized Likert scale ranking (0-no distress through 10-extreme distress).

RESULTS: 100% of staff attended presentation. 16 patients established care with Rush MD Anderson Neuro-Oncology team from June 16, 2025 through August 8, 2025. Of the 16 patients 6 male and 10 female, age distribution was 20 to 80 years, average age of 45.05 years. Distress screenings were completed with 100% of patients; physical distress about sleep was highest (1.19/10). Emotional distress regarding worry or anxiety was second highest (1.06/10). 85% were open to speaking with social worker. 100% were issued new patient folders. 50% of did have a primary care provider and 30% were open to referrals. After initial visits 40% did request referrals for supportive oncology services including: dietician, psychology, neuropsychiatry, and financial counseling.

CONCLUSION: Through completion of distress screening opportunities exist to improve patients access to care. New patient folders and increased awareness in supportive oncology services through clinic discussions increased numbers of referrals to supportive oncology services, ultimately improving quality of life.

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EVALUATION OF RADIATION-INDUCED DERMATITIS MANAGEMENT IN PATIENTS WITH BREAST CANCER RECEIVING RADIATION THERAPY

BACKGROUND AND SIGNIFICANCE: Radiation dermatitis (RD) affects more than 90% of patients with breast cancer receiving radiation therapy. RD can negatively impact patient recovery and quality of life, yet standardized prevention and management guidelines remain limited. An outpatient oncology clinic in the midwest implemented an RD management program that has not been evaluated. PURPOSE: This project evaluated the RD management program for patients with breast cancer receiving radiation therapy, describing process adherence, and RD-related factors and outcomes.

METHODS: The donabedian quality framework guided this evaluation. A retrospective chart review of patients with breast cancer receiving radiation therapy was conducted. Descriptive statistics and correlation analysis were used.

FINDINGS: Provider process adherence was 97.9%. The population (n=100) was older (mean age 60.4 years), white (48%), nonsmokers (71%), had no history of skin conditions (83.7%), had at least two medical comorbidities (56%), and the RD prevalence rate was 59%. Prevention strategies included the use of moisturizers (75%) and antimicrobials (25%). Documentation of patient adherence to prevention strategies was 80.7%. Factors with significant correlation to RD ($p < 0.05$) included radiation (dose, duration, fractionation), radiation target sites, cancer stage, and younger age.

CONCLUSIONS AND IMPLICATIONS: The strongest risk factors for RD were higher radiation dose, longer treatment duration, complex fractionation schedules, and multiple radiation target sites. Risk-based prevention strategies may reduce RD severity and improve quality of life. Improved adherence tracking and more frequent skin assessments may be warranted for patients with multiple risk factors.

Abstract/Poster #: 20
Session: Poster Presentation
Theme: Cancer Research and Translational Medicine
Trainee Rank: RMC: M2

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ARE YOUNG WOMEN UNDER 40 WITH BREAST CANCER SURGICALLY OVERTREATED?

INTRODUCTION: The incidence of breast cancer in young women under 40 is on the rise, and they often present with palpable and locally advanced disease. Despite unclear benefits in overall and disease free survival (DFS), young women are more likely to undergo bilateral mastectomy (BM) even in the absence of a pathogenic gene mutation. This study evaluates our institutional experience in young women under 40 without distant metastasis and compares oncological outcomes in patients who undergo breast conservation surgery (BCS), unilateral mastectomy (UM), and BM.

METHODS: An institutional database was reviewed retrospectively. Patient demographics, tumor characteristics, treatment options, and DFS were evaluated for women aged ≤ 40 with breast cancer (stage Tis - III) from 2008-2025. Differences between surgery type were compared using one-way ANOVA or chi-squared tests with Bonferroni correction. Kaplan-Meier survival analysis was used to estimate 5-year DFS. The significance level was set at 0.05.

RESULTS: Of the 186 women in the study, ages 23-40 (mean 32), 44 underwent BCS, 28 had UM, and 114 had BM. No differences were found in age, clinical and pathological nodal stage, hormone receptor status, HER2 status, histology, tumor grade, Ki-67, axillary surgery, adjuvant chemotherapy and endocrine therapy between the BCS, UM, and BM groups. Amongst patients who underwent UM or BM, there was no significant difference in types of reconstruction: implants, autologous, or aesthetic flat. Patients with larger tumors were more likely to undergo UM (28.6%, adj. p=0.007) or BM (25.4%, adj. p=0.009) than BCS (4.5%). Patients who received BM were significantly more likely to have a genetic mutation than those who underwent BCS (32.5% vs 9.1%, adj. p=0.003). The Kaplan-Meier analysis showed that BM patients had the lowest 5-year DFS (83.3%, 95% CI: 75.1-89.0) compared to UM (85.7%, 66.3-94.4) and BCS patients (86.4%, 72.1-93.6) (p = .044)

CONCLUSION: Despite 61% of young women under 40 undergoing BM at our institution, we found that the 5-year DFS was the lower than patients who underwent UM or BCS. These findings suggest that BM may represent overtreatment in many young women and emphasize the importance of shared decision-making focused on long-term outcomes rather than perceived oncologic benefit.

Dayashree Baskaran, BS
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MORE THAN A DIET: RELIGIOUS DIETARY RESTRICTIONS AS ETHICAL BOUNDARIES IN PHARMACOTHERAPY

INTRODUCTION: Patients sometimes decline medically indicated therapies due to conflict with religious or cultural beliefs, requiring clinicians to balance respect for patient values with the need for timely, evidence-based care. Heparin, frequently used as first-line therapy for hospitalized patients with acute pulmonary embolism (PE), is derived from porcine products, which some Muslim patients avoid. This case illustrates the complexity of anticoagulation decision-making when faith-based considerations intersect with cancer-associated thrombosis, medication adherence, and bleeding risk.

CASE PRESENTATION: A 51-year-old Muslim woman with stage IV ovarian and peritoneal cancer presented after routine imaging revealed a new right lower lobe PE. She was hemodynamically stable and asymptomatic. Standard anticoagulation with unfractionated heparin was recommended, but she declined due to its porcine origin. After discussion with the medical and pharmacy teams, she was started on Argatroban. Since Argatroban was not feasible for outpatient use, her team coordinated access to Apixaban, which she subsequently tolerated, and follow-up imaging confirmed resolution of the PE. Approximately one year later, she re-presented with bilateral segmental PEs. She reported intermittent nonadherence to Apixaban due to recurrent epistaxis, attributed in part to concurrent Bevacizumab therapy. With stable vitals and no right-heart strain, Argatroban was restarted briefly while alternative outpatient options were explored. Apixaban was reconsidered but deferred due to her bleeding history. After thorough interdisciplinary counseling, she agreed to therapeutic Enoxaparin despite its porcine origin, prioritizing its lower bleeding risk and dosing stability. She was discharged with close follow-up and an outpatient plan to consider an inferior vena cava filter if bleeding worsened. During a later hospitalization for a chemotherapy-related reaction, the patient reported that twice-daily injections were burdensome and her discomfort with porcine-derived products persisted. Following renewed discussion with her oncology and hematology teams, she transitioned back to Apixaban and has since remained adherent without recurrent epistaxis.

CONCLUSION: This case highlights the dynamic nature of religiously informed medical decision-making. Respectful dialogue, interdisciplinary collaboration, and transparent acknowledgment of therapeutic limitations enabled the team to honor the patient's beliefs while ensuring safe anticoagulation. Clinicians should recognize that faith-based preferences may evolve over time and require ongoing, flexible, patient-centered dialogue that continuously reaffirms and protects patient autonomy.

Abstract/Poster #: 22
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Post-Doctoral Research Fellow

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ASSOCIATION OF CRANIOFACIAL DIMENSIONS WITH UPPER AIRWAY COLLAPSIBILITY IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA

INTRODUCTION: Obstructive Sleep Apnea (OSA) is a condition characterized by recurrent episodes of upper airway obstruction during sleep with oxygen desaturations and arousals. First line therapy for OSA has traditionally been Positive Airway Pressure (PAP), although patient adherence to PAP can present a challenge in treatment. To determine alternative treatments for patients, it is necessary to understand the anatomical dynamics of airway collapse. Through 3D-software measurement of craniofacial dimensions from CT scans, we aimed to identify if there was a relationship between craniofacial dimensions and pharyngeal opening pressure (PhOP), which we obtained through Drug-Induced Sleep Endoscopy with Positive Airway Pressure (DISE-PAP). PhOP was used as a measure of airway collapsibility.

METHODS: This study was a series of patients with CPAP-intolerant obstructive sleep apnea (AHI greater than 5 events/hour) who presented to a sleep surgery clinic for further evaluation of PAP alternatives. Patients underwent preoperative CT imaging in a standardized fashion followed by DISE-PAP. InVivo 7 anatomical modeling software was utilized to obtain craniofacial measurements by two blinded, independent reviewers. PhOP was determined via DISE-PAP and demographics were obtained via the electronic medical record.

RESULTS: Of the 211 patients included in the study, 75% were male, 66% White, with an average age of 51 years old and average BMI of 29.9. The average AHI 3% was 35.2 events/hour. The average PhOP was 8.22 cm H2O. Maxillary hypoplasia and retrognathia as measured via SNA and SNB were weakly inversely correlated with PhOP (r = 0.15 and 0.15, respectively). Increasing airway length, hyoid distance, intermolar palatal height and piriform width were weakly correlated with PhOP (r = 0.26, 0.22, 0.16 and 0.17, respectively). Inter-rater agreement between the two independent reviewers was good to excellent across measurements collected (ICC = 0.80 - 0.99).

CONCLUSION: This study demonstrated that greater airway length, increased intermolar palatal height, increased piriform distance, and larger hyoid-to-mandibular plane distance are associated with increased PhOP. Interestingly, increasing SNA and SNB angles signaling less retrognathia were mildly associated with increasing PhOP. While craniofacial dimensions may contribute to upper airway collapsibility, PhOP is likely influenced by a more complex interplay of skeletal, soft tissue, and physiologic factors.

Abstract/Poster #: 23
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Kyle Casey, BS
Kyle Casey (Rush); Samuel Miller (Rush); Gianna Bosco (Rush)

SWEET BUT SILENT: AN UNUSUAL AFEBRILE PRESENTATION OF SWEET SYNDROME WITH NEURO-OPHTHALMIC INVOLVEMENT IN THE SETTING OF H. INFLUENZAE SKULL BASE OSTEOMYELITIS

INTRODUCTION: Sweet Syndrome (SS) is a rare dermatologic disease with varying manifestations. More than 80% of cases of SS are thought to involve fever, as infection is a common predisposing factor. We present a case of a patient with SS secondary to a rare Haemophilus influenzae skull base osteomyelitis with afebrile presentation and development of unique neuro-ophthalmic manifestations.

CASE PRESENTATION: This is a middle-aged female with no past medical history who presented to the ED with a persistent 8/10 midline occipital headache for one month. She was afebrile with vitals remarkable for mild tachycardia. She denied nausea, vomiting, diarrhea, arthralgias, or vision changes. Initial labs were significant for leukocytosis with neutrophilia, transaminitis, elevated alkaline phosphatase, and CRP. CT demonstrated paranasal sinus disease. Subsequent MRI showed mucosal thickening in the sphenoid sinus and abnormal signal intensity in the basiocciput, suggesting skull base osteomyelitis. The patient underwent sinus surgery with clivus biopsy, cultures of which grew Haemophilus influenzae. The following day, erythematous pruritic palpable purpuric macules, papules, and plaques with central hemorrhagic bullae developed on the bilateral lower extremities and pustules on the dorsa of the left hand while the patient remained afebrile. A punch biopsy showed dense neutrophilic infiltrates with fibrinoid necrosis, most consistent with Sweet Syndrome, but also concerning for vasculitis. However, vasculitis was less likely considering an unremarkable autoimmune rheumatologic workup. Given the active infection, the patient was started on a steroid-sparing Colchicine regimen. One week later, the patient began to experience blurry vision in the right eye, progressing to a new afferent pupillary defect, bilateral CN VI palsy, and worsening papilledema. Lumbar puncture revealed increased opening pressure, and subsequent CT showed elevated intracranial pressure. IV solumedrol and acetazolamide were initiated due to vision changes and bilateral papilledema. The patient's vision and elevated ICP fully resolved six days later.

CONCLUSION: Overall, this case emphasizes the variety of presentation and etiology of Sweet Syndrome. This patient remained afebrile throughout her hospitalization and developed neuro-ophthalmic involvement related to SS. This was all found in the setting of an already rare Haemophilus influenzae osteomyelitis of the skull base.

Abstract/Poster #: 24
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Rachael Chait, MD, MPH
Rachael Chait, MD, MPH (Rush), Michael Zhang, MD (Rush), Juan Ortiz Rodriguez, MD (Rush), Prema Nanavaty, MD (Rush)

A CASE OF PNEUMOCYSTIS JIROVECII PNEUMONIA IN THE SETTING OF HYPOGAMMAGLOBULINEMIA

INTRODUCTION: Pneumocystis jirovecii pneumonia (PJP) is underrecognized and understudied in HIV-negative patients. The clinical presentation in HIV-negative patients is more acute and severe than HIV-positive patients. HIV-negative patients with PJP experience markedly higher mortality rates (30-50%) than HIV-positive patients (10-20%). This case presents the diagnosis and treatment of PJP in a HIV-negative immunocompromised patient.

CASE PRESENTATION: A 68-year-old male with a history of diffuse large B-cell lymphoma prior chemotherapy, autologous stem cell transplant, and CAR-T therapy presented with two weeks of dyspnea and hypoxic respiratory failure. In the ICU, he required high flow nasal cannula 40L/min at 70% FiO2. CT angiogram ruled out a pulmonary embolism but revealed new diffuse bilateral ground-glass opacities with subpleural sparing and interlobular septal thickening. Pre-admission immunoglobulin testing, performed due to his DLBCL history, showed markedly reduced IgG, IgA, and IgM levels. Laboratory evaluation was notable for an elevated LDH. Bronchoalveolar lavage smear was positive for Pneumocystis jirovecii. The patient was treated with trimethoprim-sulfamethoxazole, corticosteroids, and IVIG replacement. His oxygen requirements improved, and he was discharged on 2 L/min oxygen with close outpatient follow-up.

CONCLUSION: This case demonstrates PJP in a HIV-negative patient who was immunocompromised secondary to treatment-related hypogammaglobulinemia. Even though PJP affects 35.4% of HIV-positive patients, 10.2% of HIV-negative immunocompromised patients still contract PJP. Although trimethoprim-sulfamethoxazole is the first-line treatment for PJP, the benefit of adjunctive steroids in HIV-negative patients remains unclear despite proven mortality reduction in HIV-positive patients. Some studies indicate that steroids may be linked to higher mortality in HIV-negative patients or may offer no mortality benefit. In HIV-negative PJP, a more intense alveolar inflammatory response contributes to respiratory failure; adjunctive steroids mitigate this inflammation. However, steroids in HIV-negative patients could further worsen their immune system based on the etiology of their immunocompromised state, leading to current research suggesting the use only in severe hypoxemia. In this patient, steroids were initiated for severe respiratory failure, and he was observed inpatient with no further deterioration. Despite a smaller prevalence, HIV-negative immunocompromised patients with PJP have more rapid progression and higher mortality rates than HIV-positive patients, and more research should address the safety of steroids in this population.

Abstract/Poster #: 25
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

Joanna Choe, BS
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ENHANCED SENSITIVITY FOR HEPATIC LESIONS USING CT ANGIOGRAPHY: A CASE-BASED ANALYSIS

INTRODUCTION: Accurate evaluation of hepatic lesion burden is an essential step in treatment decision-making in patients with multifocal and complex liver disease. Conventional imaging modalities like multiphasic computed tomography (CT) or magnetic resonance imaging (MRI) may miss small, recurrent, or metastatic lesions. This case illustrates how CT angiography can be a superior method in identifying the extent of hepatic disease.

CASE PRESENTATION: A 67-year-old male with a history of HTN and HLD presented with acute abdominal pain and vomiting. An initial abdominal CT scan showed a 3.7x2.7 cm small bowel mass with at least 30 low-attenuation bilobar hepatic lesions. Patient was diagnosed with small bowel neuroendocrine tumor with liver metastases. Due to the well-differentiated liver lesions demonstrated in the initial abdominal CT, surgical resection was favored as the first treatment option. Subsequent multiplanar and multisequence Eovist MRI taken a month later showed metastatic lesions in the inferior right liver lobe and subcapsular region of segment IV, multiple peripheral wedge-shaped hyperintensities, and additional simple hepatic cysts uncaptured from initial imaging. The treatment plan was modified after the subsequent MRI demonstrating more extensive disease to the embolization of the right lobe of the liver and surgical resection of the left side of the liver. Prior to the embolization procedure, a hepatic visceral CT angiogram exhibited more extensive bilobar disease, especially in the right hepatic lobe. This prompted the final treatment plan to include embolization of the right hepatic lobe, partial hepatectomy to segments III and V a month later, and embolization of the left hepatic lobe two months later. No postprocedural complications were noted and 6-month follow up imaging showed stable disease with no arterial hyperenhancing lesions.

DISCUSSION: This case demonstrates the superior sensitivity of CT angiography for detecting hepatic lesions through direct arterial imaging, reducing the need for redundant imaging and invasive biopsies. Especially in complex cases of multifocal, recurrent, or small lesions, angioCT can more accurately detect and delineate the extent of disease and could streamline the interventional workflow by allowing interventionalists to couple imaging and treatment together in a single session.

Abstract/Poster #: 26
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

Cassidy Craig, BS
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THE IMPACT OF FOUR-DIMENSIONAL COMPUTED TOMOGRAPHY ON HEPATOCELLULAR CARCINOMA STAGING AND TRANSPLANT EVALUATION

INTRODUCTION: The primary aim of this study is to determine if the use of four-dimensional computed tomography (4D CT) as a diagnostic tool for hepatocellular carcinoma (HCC) leads to increased staging accuracy and a more streamlined transplant evaluation process by reducing the need for invasive diagnostic procedures.

MATERIALS AND METHODS: A single-institution, retrospective case analysis was conducted. Data was collected from medical records of patients ≥18 years old with suspected HCC, who underwent 4D CT imaging for staging and transplant evaluation process. Patients included had concerns for possible HCC diagnosis and were evaluated using 4D CT or standard imaging modalities (CT or MRI) between January 1, 2023, and September 1, 2025. The study cohort comprised 17 patients with a mean age of 61.3 years. 13 were male (76.5%), and 4 were female (23.5%).

RESULTS: Preliminary analysis revealed 4D CT improved diagnostic accuracy in 37.5% ($p = 0.25$) of patients undergoing evaluation for HCC, meaning those initially diagnosed with LI-RADS <5 based on CT or MRI were reclassified to LI-RADS 5. This established definitive diagnosis eliminating the need for invasive biopsy. In addition, patients that were converted to LI-RADS 5 status were simultaneously mapped for Y-90 treatment, which saved time in scheduling and waiting. Patients that were not converted to LI-RADS 5 at the time of CT angio underwent biopsy for definitive diagnosis in the same setting.

CONCLUSION: Integrating 4D CT into diagnostic practice for suspected HCC provides notable improvement in staging accuracy, despite the lack of statistical significance. Clinically, these findings have the potential to reduce the need for invasive procedures; in the cohort, 37.5% of patients with initially indeterminate findings were reclassified to a definitive LI-RADS 5 diagnosis with 4D CT, thereby avoiding the risks and delays associated with liver biopsy or subsequent scheduling of Y-90 mapping procedure. Due to novelty and early adoption of 4D CT, the primary limitation to this study is the small sample size as the statistical power constrains the generalizability of the results and the ability to draw

CONCLUSIONs. However, the results are promising for the use of 4D CT to facilitate more accurate staging, streamline the transplant

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MIRTAZAPINE-ASSOCIATED ANEMIA IN A PATIENT WITH MYELOFIBROSIS POST-STEM CELL TRANSPLANT: A CASE REPORT

BACKGROUND/PURPOSE: Mirtazapine, an atypical tetracyclic antidepressant, is infrequently associated with hematologic toxicities. Reports of mirtazapine-induced anemia are especially rare, yet they pose unique challenges in patients with underlying bone marrow pathology. We present a case of progressive, transfusion-dependent anemia in a patient with myelofibrosis following stem cell transplantation, temporally associated with mirtazapine treatment.

CASE PRESENTATION: A patient with primary myelofibrosis status post allogeneic stem cell transplant developed progressive anemia during treatment with mirtazapine, initially prescribed for insomnia and mood disturbance. Clinical data, including serial complete blood counts, bone marrow biopsy results, and transfusion history, were reviewed. The treatment plan included ongoing disease-directed therapies (luspatercept, immunosuppression, and transfusions) alongside antidepressant management. A trial discontinuation of mirtazapine was conducted to evaluate its potential contribution to worsening cytopenias. Prior to mirtazapine initiation, the patient had mild normocytic anemia (Hgb 10.3). Over the following year, hemoglobin levels progressively declined despite disease-modifying therapy and transfusions, reaching a nadir of 5-6 g/dL. Bone marrow biopsy confirmed myelofibrosis, but no clear etiology for pure red cell aplasia was identified. Following discontinuation of mirtazapine in December 2024, alongside ongoing IVIG and luspatercept, hemoglobin normalized to 12.2 by January 2025. The temporal relationship between initiation and discontinuation of mirtazapine with anemia progression and resolution supports a drug-related contribution.

CONCLUSION/IMPLICATIONS: This case highlights the importance of considering antidepressant-associated hematologic toxicity in patients with cancer and underlying marrow disorders. Although confounded by myelofibrosis, transplant-related complications, and concurrent therapies, the strong temporal association suggests a role for mirtazapine in this patient's anemia. Clinicians should maintain vigilance for psychiatric medication side effects in oncology populations, particularly when cytopenias have multifactorial causes. Future research is needed to clarify mechanisms of antidepressant-related marrow suppression and to inform safer prescribing practices. Emphasis should be placed on tailoring psychopharmacologic care for medically complex patients.

Abstract/Poster #: 28
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

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MIMICRY IN MALIGNANCY: AN INFECTIOUS COMPLICATION IN EXTRAOCULAR SEBACEOUS GLAND CARCINOMA

INTRODUCTION: Sebaceous gland carcinoma (SGC) is an uncommon cutaneous malignancy characterized by aggressive behavior and accounts for approximately 0.7% of skin cancers. Although classically periocular, nearly one quarter of cases arise at extraocular sites, with upper-extremity involvement rarely reported. Disruption of lymphatic drainage and immunosuppression following oncologic treatment may further predispose patients to infectious complications.

CASE PRESENTATION: An immunocompromised man with metastatic extraocular SGC of the left upper extremity presented with acute swelling, erythema, warmth, and tenderness during physical therapy for chronic lymphedema. His oncologic history included prior surgical and radiation-based treatment for SGC with regional lymphatic involvement. Physical examination revealed localized erythema and edema without fluctuance. The differential diagnosis included cellulitis, malignant recurrence, contact dermatitis, and treatment-related inflammatory reactions. Clinical assessment favored cellulitis based on localized inflammatory findings, prior lymph node dissection, and absence of systemic symptoms. Infectious disease consultation was obtained, and intravenous antibiotics, limb elevation, and supportive care were initiated.

CONCLUSION: Extraocular SGC involving the upper extremity is exceedingly rare. This case highlights the dual vulnerability of oncology patients with impaired lymphatic drainage, who remain at risk for both metastatic recurrence and secondary infection. It underscores the importance of maintaining a high index of suspicion for infectious etiologies in patients with malignancy-associated lymphatic compromise. Systematic reporting of such cases may refine surveillance strategies and advance precision in managing rare oncologic presentations.

Katharine Jeffreys, BA
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METRONIDAZOLE-INDUCED MANIC EPISODE WITH MIXED FEATURES

INTRODUCTION: Metronidazole (MTZ) is a commonly used antibiotic for bacterial and protozoal infections. Although generally safe, MTZ is associated with CNS side effects, and can contribute to neuropsychiatric presentations. Drug-induced mania is a phenomenon where a substance precipitates a manic episode that is not better explained by the patient's prior psychiatric history. Patients with drug-induced mania may exhibit erratic behavior and impaired judgment, often leading to severe functional disruption and acute safety concerns. Cases of MTZ-induced mania are exceedingly rare. Our current study examines the relationship between MTZ use and mania with mixed and psychotic features, which subsided after discontinuation of MTZ.

CASE PRESENTATION: Our patient was a 24-year-old woman with a past medical history of bilateral kidney stones and a psychiatric history of persistent depressive disorder and adverse childhood experiences (ACEs). She was started on MTZ by her primary care physician to treat her episode of trichomoniasis. On her first day of starting MTZ, she began to experience increased irritability, restlessness, risky behaviors such as excessive spending, sexual impulsivity, and a decreased need for sleep. Although she previously endorsed passive suicidality, the patient began to experience active suicidal ideation with intent. She also developed persecutory delusions that her family members were attempting to poison her. Over the next several days, her symptoms persisted. At the recommendation of her PCP, she discontinued MTZ five days after the start of her treatment. One day after discontinuation of MTZ, her paranoia and suicidal intent resolved. However, it took her mood fluctuations and sexual impulsivity several months to subside.

CONCLUSION: MTZ has been shown to reversibly inhibit MAO transporters in vitro, which could increase dopaminergic pathways leading to symptoms such as paranoia, suicidal ideation, and psychotic features observed in this case. It is possible that the patient's pre-existing psychopathology, possibly involving underlying dopaminergic dysregulation secondary to depression and chronic stress due to ACEs, increased her vulnerability to MTZ's pro-dopaminergic effects. This case underscores the need for high clinical suspicion of MTZ as a possible cause of acute mania and psychosis and warrants further research into how MTZ affects monoamine signaling in vulnerable populations to optimize prescribing guidance.

Abstract/Poster #: 30
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Lily Johnsky, BS
Lily Johnsky, BS (Rush); Ummesalmah Abdulbaseer, MD (Rush); Osama Elkhatib, MD (Rush)

SPONTANEOUS KLEBSIELLA OXYTOCA HEPATIC ABSCESS IN AN IMMUNOCOMPETENT PATIENT: A CASE REPORT

INTRODUCTION: Pyogenic liver abscesses (PLA) are rare but serious infections, most commonly caused by enteric gram-negative organisms such as Escherichia coli and Klebsiella pneumoniae. In contrast to K. pneumoniae, which has documented hypervirulent strains associated with liver abscesses, K. oxytoca is less commonly reported and is not typically associated with liver abscesses in immunocompetent patients. We describe a rare case of a large K. oxytoca perihepatic abscess in an adult male with no identifiable predisposing factors.

CASE PRESENTATION: A 48-year-old male presented with a two-week history of night sweats, right flank pain, and fevers reaching 105°F. He also reported a new dry cough and an unintentional 11-pound weight loss over 6 weeks. On examination, the abdomen was soft and nondistended, with notable right lateral abdominal tenderness. No hepatomegaly was noted. Initial workup showed a WBC count of 12.49 K/uL with no eosinophilia and a platelet count of 457 K/uL. CT of the abdomen revealed a multiloculated, thick-walled, peripherally enhancing fluid collection along the posterior right hepatic lobe measuring 9.9 × 3.7 × 9.5 cm, consistent with a perihepatic abscess. Interventional radiology performed aspiration and placed a drainage catheter. Approximately 80 mL of purulent fluid was aspirated, and cultures grew K. oxytoca. The patient completed a four-week course of levofloxacin and a two-week course of metronidazole, resulting in complete symptom resolution.

DISCUSSION: This case highlights the uncommon occurrence of K. oxytoca as the causative agent in PLA. Klebsiella spp. are emerging as an important cause of PLA, with studies noting malignancy as a predisposing factor. This patient had no predisposing factors, including immunosuppression or family history of malignancy. Early aspiration allows identification of the causative organism and helps prevent progression to sepsis. Recent studies show that K. oxytoca can cause metastatic infection similar to invasive liver abscess syndrome, emphasizing early and intensive antibiotic therapy. Additionally, K. oxytoca is demonstrating multidrug resistance at higher rates than K. pneumoniae. Early multidisciplinary coordination, particularly with infectious diseases, is essential to optimize therapy and prevent complications.

Abstract/Poster #: 31
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Anneka Johnston, MD, BA
Dr. Anneka Johnston (Rush); Dr. Aniruddha Deka (Rush); Dr. Sumbul Liaqat (Rush); Dr. Syed Basir Hussaini (Rush)

TO TREAT OR NOT TO TREAT: A CASE REPORT AND LITERATURE REVIEW OF CHARLES BONNET SYNDROME IN PATIENTS WITH BRAIN MASSES

INTRODUCTION: Charles Bonnet Syndrome (CBS), characterized by visual release hallucinations, is reported in up to 26 percent of patients with low visual acuity (Cristoph, 2024). The etiopathogenesis and management strategies are not well understood. This case report and literature review characterizes CBS in patients with brain masses.

CASE PRESENTATION: A 55-year-old female with a history of invasive ductal carcinoma and no psychiatric history presented with nausea, vomiting, left visual field deficits, and complex visual hallucinations confined to her left visual field. MRI demonstrated right parietal and cerebellar mass lesions with surrounding edema. Following craniotomy and mass resection, her visual deficits improved, but hallucinations persisted. Psychiatry was consulted. She had intact insight into her hallucinations, limited distress, and no delirium, or seizures. She had no apparent visual compromise on cursory evaluations post-resection. Two weeks later, the hallucinations resolved without psychotropic intervention.

CONCLUSION: The patient's presentation was consistent with CBS, triggered by brain metastases, and persisted post-resection. We conducted a literature review, which identified six cases with varied etiologies and mass locations, and suggested that hallucinations often self-resolve in days to months following resection (Ovchinnikov, 2024; Freiman, 2004; Parkinson, 1952; Lomelin Lopez, 2021). We will further characterize these cases in our presentation. There was limited evidence supporting the use of pharmacological treatments. Guided by the literature, we employed a "watch and wait" approach, which led to resolution in 2 weeks. Even if brain masses are not directly in the visual pathway, locations at higher level cortical structures could lead to neuronal excitation in visual processing areas, or independently produce hallucinations (Ovchinnikov, 2024; Freiman, 2004). Another factor could be indirect mass effect near the occipital lobe, including postoperative edema (Parkinson, 1952). Our patient's subtle visual field deficits also underscore the need to consider CBS even in those without apparent visual loss. CBS should be considered in patients with brain masses and complex visual hallucinations. Given the potential for spontaneous resolution, conservative management may be appropriate in the absence of distress or comorbid psychiatric symptoms.

Abstract/Poster #: 32
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Lakshmi Kasi, BA, MD
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POST-HYPOGLYCEMIC BRAIN INJURY WITH HYPERKINETIC CATATONIA-LIKE FEATURES

INTRODUCTION: Profound hypoglycemia can lead to neuronal brain injury with significant neurologic sequelae, including seizures, cognitive dysfunction, and coma.1,2 Despite distinct characteristics, hypoglycemic brain injury and catatonia may present similarly due to overlapping clinical features and nonspecific diagnostic findings. This case highlights the challenge of distinguishing evolving post-hypoglycemic brain injury from a hyperkinetic catatonia-like presentation.

CASE PRESENTATION: A 38-year-old woman with no significant medical history presented after three seizures. Evaluation revealed profound hypoglycemia (25 mg/dL), elevated creatine kinase, elevated lactate, and leukocytosis. She received benzodiazepines, was intubated, and was transferred for higher-level care. Extensive workup-including MRI/MRA, serial EEGs, lumbar puncture, autoimmune, infectious, toxic/metabolic, and malignancy testing-was unrevealing aside from transient MRI diffusion restriction consistent with hypoglycemic injury. Hypoglycemia was suspected to be related to herbal supplements; her glucose levels remained stable during hospitalization. Following extubation, she demonstrated altered mentation, mutism, inability to follow commands, rigidity, and agitation. Her presentation was thought to be consistent with hyperkinetic catatonia, supported by partial response to treatment with Ativan (Bush-Francis score decreased from 16 to 10). Due to persistent symptoms, she received adjunctive zolpidem, memantine, amantadine, empiric corticosteroids, IVIG, and 15 ECT treatments. She had some improvement with ECT, regaining the ability to say short phrases, follow simple commands, and ambulate. Over time, the patient developed increasing restlessness, impulsivity, agitation, and garbled speech, while classic catatonic features-including stupor, staring, rigidity, stereotypies, and gegenhalten-resolved. Her evolving clinical picture became more consistent with neurologic sequelae of hypoglycemic brain injury than persistent hyperkinetic catatonia. She has now been hospitalized for more than 80 days, remains far from her baseline, and is unstable for discharge.

CONCLUSION: This case illustrates how early manifestations of hypoglycemic brain injury and catatonia can initially produce similar abnormalities in mentation and psychomotor function. Although the patient showed some improvement with benzodiazepines and ECT, her persistent behavioral dysregulation and cognitive impairment ultimately reflected sequelae of post-hypoglycemic brain injury rather than ongoing catatonia. This diagnostic transition underscores the importance of continuous reassessment. Such reassessment, guided by clinical changes and multimodal evaluation, is essential when managing evolving encephalopathy with catatonia-like presentations.

Abstract/Poster #: 33
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Sarah Kee, BS
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BEYOND THE CURAÇAO CRITERIA: A MOLECULAR DIAGNOSIS OF HEREDITARY HEMORRHAGIC TELANGIECTASIA AND JUVENILE POLYPOSIS REVEALED IN A CHILD WITH MULTIPLE CEREBRAL ABSCESSES

INTRODUCTION: Hereditary hemorrhagic telangiectasia (HHT) syndrome is a rare autosomal dominant disease characterized by vascular dysplasia. A clinical diagnosis of HHT is made when an individual meets three of the Curaçao criteria, which include (1) family history, (2) recurrent epistaxis, (3) telangiectasias, and (4) visceral arteriovenous malformations (AVMs). However, these criteria are insufficient in children due to the age-dependent development of some of them. Additionally, individuals with HHT conferred by loss-of-function SMAD4 mutations also have juvenile polyposis (JPS). We present a pediatric case in which whole-genome sequencing (WGS) established the diagnosis of HHT/JPS with multiple cerebral abscesses as the presenting finding.

CASE PRESENTATION: A 9-year-old female was admitted for asthma exacerbation that improved with systemic steroids and nebulizer treatments except for persistent mild hypoxemia. She had endorsed a headache, and a CT of the brain demonstrated multiple hypoattenuating lesions. A subsequent MRI showed innumerable ring-enhancing hemorrhagic lesions. Suspicion for metastatic spread of infection from a cardiac or pulmonary source prompted additional studies, and a CT chest showed innumerable ill-defined ground-glass and vascularized nodular opacities throughout the bilateral lungs. Cultures from a biopsied brain lesion eventually grew Streptococcus intermedius. As her course progressed, the pulmonary nodules did not improve on subsequent CT imaging despite appropriate antibiotics, leading to suspicion that these were pulmonary AVMs and the patient had a vascular dysplasia syndrome. The patient did not have a history of recurrent epistaxis or evidence of telangiectasias, although she did have mild clubbing of her fingers. WGS found the patient was heterozygous for a de novo variant of uncertain significance (although likely pathogenic) in SMAD4, consistent with a diagnosis of HHT/JPS.

CONCLUSION: This case highlights that since pediatric patients often lack overt HHT signs and symptoms, molecular diagnostic methods should be considered for patients with visceral AVMs, even in the absence of other Curaçao clinical criteria. Furthermore, this underscores the need to consider pulmonary AVMs as a potential source of cerebral infections, especially in the absence of signs of endocarditis. HHT is a complex and serious disorder that necessitates a high index of suspicion and interdisciplinary decision-making to guide diagnosis and treatment.

Abstract/Poster #: 34
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Ashley Lester, MD
Ashley Lester (Rush), Melissa Larson (Rush)

A COMPLEX CASE OF LARGE B-CELL LYMPHOMA PRESENTING WITH HEMOPHAGOCYTIC LYMOPHOHISTIOCYTOSIS

INTRODUCTION: Hemophagocytic Lymphohistiocytosis (HLH) is a rare, life-threatening syndrome triggered by excessive activation of cytotoxic T-cells and macrophages, often associated with hematologic malignancies. Prognosis is poor, with death often due to systemic organ involvement. This report presents a case of HLH associated with large B-cell lymphoma (DLBCL), along with renal, hepatic, and hematologic dysfunction.

CASE REPORT: A 52-year-old male with a two-month history of abdominal pain, weight loss, and fever was found to have splenomegaly, splenic infarct, and lymphadenopathy on CT. Initial workup revealed pancytopenia, nephrotic-range proteinuria, and liver injury. Ferritin (18,732 ng/mL), triglycerides (501 mg/dL), and soluble CD25 (33,603 U/mL) were elevated, suggesting HLH. A bone marrow biopsy confirmed hemophagocytosis, and an excisional lymph node biopsy diagnosed large B-cell lymphoma. A renal biopsy revealed focal segmental glomerulosclerosis (FSGS), collapsing type. The patient progressed to septic shock, requiring vasopressors and continuous renal replacement therapy. Coagulopathy developed (INR 3.13), and further workup revealed DIC. Treatment included rituximab and etoposide for HLH, high-dose steroids for FSGS and HLH, and cryoprecipitate, platelets, and pRBCs for DIC. Despite treatment, the patient developed severe abdominal pain, elevated lactic acid, and CT findings of pneumatosis intestinalis and portal venous gas, likely due to mesenteric ischemia from DIC. With rapid clinical deterioration and no surgical options due to pancytopenia, the patient opted for DNR status and passed away shortly thereafter.

DISCUSSION: This case highlights the complex comorbidities in DLBCL with concurrent HLH, including rare associations like FSGS. HLH often causes liver injury, and the patient's coagulopathy likely resulted from a combination of liver failure, malignancy, DIC, and chemotherapy. CT findings suggest acute mesenteric ischemia, leading to rapid deterioration and death despite aggressive treatment.

Abstract/Poster #: 35
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

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TIRZEPATIDE AS A NOVEL ADJUNCTIVE TREATMENT FOR ALCOHOL USE DISORDER: A CASE REPORT

INTRODUCTION: Alcohol use disorder (AUD) remains a highly prevalent and debilitating condition with limited pharmacologic options that reliably reduce cravings and prevent relapse. Emerging evidence suggests that glucagon-like peptide-1 (GLP-1) receptor agonists and dual agonists (GLP-1/GIP), including tirzepatide, may modulate reward pathways involved in alcohol consumption, reduce hedonic drive, and impact compulsive substance use behaviors. While preclinical and early human studies have shown promise, real-world clinical data remain sparse. This case report describes a 36-year-old woman with severe, recurrent major depressive disorder, generalized anxiety disorder, ADHD, eating disorder, and alcohol use disorder in whom tirzepatide was used adjunctively for reduction of alcohol cravings and stabilization of AUD symptoms.

CASE PRESENTATION: The patient is a 36-year-old female with a longstanding history of alcohol use beginning in adolescence, periods of heavy binge drinking, and prior treatments with naltrexone, acamprosate, and antabuse without sustained benefit. She achieved sobriety in February 2024 but continued to experience intermittent alcohol cravings and significant psychosocial stressors that historically contributed to relapse. She was engaged in psychotherapy and pharmacotherapy with sertraline, bupropion XL, gabapentin (100-300 mg PRN), and Adderall XR for ADHD. Given persistent cravings and difficulty with stress-induced urges resulting in other illicit substance use (Kratom and LSD), tirzepatide (Zepbound) 2.5 mg weekly was initiated, later titrated to 5 mg weekly. Over subsequent visits, the patient consistently reported a marked reduction in alcohol cravings, decreased preoccupation with alcohol, improved control over urges during periods of stress, and enhanced ability to refrain from impulsive drinking or illicit substance use. Additional benefits included appetite normalization, improved emotional regulation, and better organizational functioning, without significant adverse effects. Throughout treatment, she remained adherent, maintained sobriety, and demonstrated improved overall functioning.

CONCLUSIONS: This case highlights the potential therapeutic role of tirzepatide in reducing alcohol cravings and supporting relapse prevention in individuals with AUD, particularly those with co-occurring psychiatric conditions. Tirzepatide's dual GLP-1/GIP agonist activity may modulate reward circuitry and reduce compulsive substance-seeking behaviors. While controlled studies are needed to establish efficacy, safety, and clinical guidelines, this case adds to emerging evidence suggesting tirzepatide may represent a promising adjunctive pharmacologic option for AUD.

Christine Lin, BA
Christine Lin, BA, Brittany Doll, M.D., Arti Narsinghani, M.D.

WHEN MUSCLES SPEAK: NECROTIZING MYOPATHY AS THE FIRST SIGN OF LUNG CANCER

INTRODUCTION: This case describes paraneoplastic seronegative immune-mediated necrotizing myopathy (IMNM) secondary to non-small cell lung carcinoma (NSCLC). IMNM is a rare idiopathic inflammatory myopathy characterized by progressive, symmetric proximal muscle weakness, markedly elevated CK levels, and biopsy findings of myonecrosis with minimal inflammatory infiltrate. Prior cases typically presented with systemic symptoms of malignancy. The absence of overt cancer-related signs in this case posed a significant diagnostic challenge.

CASE PRESENTATION: A 61-year-old male with a history of tobacco use was admitted for two months of progressive muscle weakness. He denied constitutional, respiratory, or dermatologic symptoms. Exam confirmed symmetric proximal muscle weakness. Labs revealed an elevated alanine aminotransferase (ALT) at 318 U/L (reference range: 3-44 U/L) and aspartate aminotransferase (AST) at 319 U/L (reference range: 0-40 U/L); normal alkaline phosphatase, total bilirubin, and gamma-glutamyl transferase; and elevated creatine kinase (CK) at 11,693 U/L (reference range: 10-205), C-reactive protein at 31.1 mg/L (reference range: ≤5), and erythrocyte sedimentation rate at 40 mm/hr (reference range: ≤17). Workup for inflammatory myopathy, including infectious, autoantibody (myositis-specific, paraneoplastic, antinuclear antibody, rheumatoid factors), complement, thyroid, and methylmalonic acid, was unremarkable. Electromyography showed irritative myopathy. Muscle biopsy revealed myonecrosis, myophagocytosis, and regenerating fibers without significant inflammation. Findings were consistent with seronegative IMNM. Given known malignancy associations, CT was done and revealed a left upper-lobe mass with bilateral hilar and peribronchial lymphadenopathy. Fine-needle aspiration of a left supraclavicular lymph node confirmed NSCLC. High-dose methylprednisolone (1g x five days) and IVIG (30g daily) were initiated. CK fell to 3,282 U/L and strength improved. The patient was discharged for coordinated oncology and neuromuscular follow-up.

CONCLUSION: This case highlights the importance of considering a paraneoplastic process even in the absence of malignancy symptoms. Recognizing that the elevated ALT and AST were secondary to muscle rather than hepatic injury, in the context of proximal weakness, elevated CK, and inflammation, was crucial for timely biopsy, malignancy screening, and immunotherapy. Early identification and collaboration with neurology, rheumatology, and oncology can facilitate prompt immunotherapy and cancer management, preserving function and preventing irreversible muscle damage in seronegative paraneoplastic IMNM.

Neel Matiwala, BS, MD
Dina Nashed (Rush University, Internal Medicine)

ATG INDUCED ARDS: A DEADLY SEQUELAE IN REFRACTORY HEPATIC GRAFT VERSUS HOST DISEASE

INTRODUCTION: Graft-Versus-Host Disease (GVHD) is a common complication of hematopoietic stem cell transplant in which donor T-lymphocytes attack host tissues. When the liver is targeted (hGVHD), diagnosis is confirmed through biopsy and first line treatment is steroids with or without a calcineurin inhibitor. Sadly, prognosis remains poor with only 30-50% of patients with hGVHD responding to first line therapy. Furthermore, 60% of patients who become steroid dependent or steroid resistant pass away within 6 months. Second line therapies remain broad ranging from immunotherapies, extracorporeal photophoresis, and anti-thymocyte globulins (ATG), yet no optimal treatment has been established. Here we present a patient with steroid refractory hGVHD who developed acute respiratory distress syndrome (ARDS) following ATG therapy.

CASE PRESENTATION: 56-year-old male with a history of myelofibrosis status post allogeneic stem cell transplantation and hGVHD recently treated with methylprednisolone, mycophenolate mofetil, ruxolitinib, ATG and tacrolimus was directly admitted for worsening of acute hGVD with elevated liver enzymes and bilirubin. On admission, he was given the first of three doses of ATG. Despite administration of ATG along with methylprednisolone and mycophenolate motil, the patient continued to have an uptrend in bilirubin prompting a liver biopsy which confirmed acute hGVHD. He was later started on a second course of ATG but 1.5 hours into treatment, he developed acute hypoxia and was transferred to the ICU for respiratory support. Imaging revealed bilateral ground-glass opacities consistent with ARDS, prompting cessation of ATG and intubation due to tachypnea. Despite diuresis, high dose steroids, and broad spectrum antimicrobials, the patient's respiratory status did not improve further suggesting ATG as the trigger for decompensation. His condition continued to deteriorate with escalating vasopressor needs, culminating in pulseless electrical activity arrest. After obtaining ROSC then transitioning to Do-Not-Resuscitate per family wishes, he passed away.

CONCLUSION: With only 5 cases of ARDS following ATG administration, our case highlights a rare sequelae of ATG infusions. Caution should be taken when selecting second line therapies for steroid refractory GVHD and respiratory distress should be monitored closely when selecting ATG as the consequences may prove deadly.

Amelia McLain, BA in Psychology
Amelia McLain (Rush University)

TALKING WITH HANDS: CHANGES IN GESTURE USE DURING APHASIA GROUP TREATMENT

INTRODUCTION: Aphasia is a neurogenic language disorder resulting from head injury (e.g., stroke) to brain regions responsible for expressive and receptive language. Aphasia can affect speaking, understanding, reading, and writing, while cognition and intelligence remain largely intact. Collaborative Referencing Intervention (CRI) is a novel treatment that promotes interactive, multimodal communication between individuals with aphasia and their communication partners through a photo-matching barrier game. While previous CRI studies have demonstrated verbal communication gains from CRI, limited research has explored its impact on nonverbal communication, specifically the use of hand gestures. Hand gestures are often a communication strength for people with aphasia (PWA), even for those with the most severe form of the disorder (e.g., global aphasia).

METHODS: This study examined changes in hand gesture use and spoken language measures across treatment in a group CRI (G-CRI) setting. Three participants with chronic aphasia completed 10 G-CRI sessions with a trained speech-language pathologist (SLP). Separated by a barrier, participants took turns identifying and matching photos while conversing and developing labels. Gesture data from sessions 1, 3, 5, 7, and 10 were analyzed by type (referential, nonreferential, other) and frequency. Spoken language measures included Multimodal Initiating Referential Expressions (MIREs), representing verbal and/or gestural labels, and Trouble-Indicating Behaviors (TIBs), reflecting aphasic errors during communication breakdowns.

RESULTS: Preliminary results reveal that total gesture use declined by over 70%, from 348 gestures in session 1 to 93 in session 10. Referential gestures decreased from 135 to 33, and nonreferential gestures from 176 to 28. Participants showed reduced gesture frequency, suggesting greater verbal communicative efficiency and refinement. MIRE analysis revealed a shift from indefinite to definite referencing strategies, indicating more direct and informative referential labels.

CONCLUSION: These findings suggest that G-CRI facilitates the development of more precise and efficient multimodal communication among individuals with aphasia, as participants relied less on gestures and more on clear, shared verbal-gestural references to achieve mutual understanding in a group treatment setting. Findings from this study provides new insights into how G-CRI influences gestural communication as used by PWA and can suggest how these changes may relate to broader gains found in collaborative referencing for future intervention.

Abstract/Poster #: 39
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Benjamin Muller, BA
Benjamin D Muller, BA - Rush Medical College Elizabeth Fisher, MD - Rush University Medical Center Zain Nayani, DO - Rush University Medical Center

ISOLATED L4/L5 STREP BOVIS OSTEOMYELITIS WITH EXTENDING INTRAMUSCULAR ABSCESSES: A CASE REPORT

OBJECTIVE: To present a rare case of isolated Streptococcus bovis osteomyelitis with no typical risk factors or infectious origin.

BACKGROUND: A 60-year-old female with a past medical history of T2DM and recently treated H. Pylori presented with one month of lower back pain with radiation down bilateral legs. She had a mechanical fall three months prior, but denied wounds or skin injury. The patient denied IV drug use and any recent travel. CT spine demonstrated L4/L5 discitis/osteomyelitis, along with epidural phlegmon extending to psoas muscle.

CASE DESCRIPTION: A thorough infectious workup was performed. Chest x-ray demonstrated no focal consolidations, infiltrates, or cavitary lesions. TTE showed no evidence of infective endocarditis. Initial and subsequent blood cultures were negative throughout the hospitalization. A fluoroscopic disk biopsy was performed and grew Streptococcus bovis group. Due to concern for colon cancer, a colonoscopy was performed and demonstrated one 2mm polyp in the ascending colon and mild diverticulosis in the sigmoid colon. There was no evidence of colorectal malignancy. The patient was discharged on IV ceftriaxone to complete a 6 week course.

DISCUSSION: Isolated Streptococcus bovis osteomyelitis is rare. Previous data has demonstrated that infective endocarditis is associated with 59% of S. bovis osteoarticular infections. Furthermore, colorectal neoplasms were found in over 70% of patients who underwent colonoscopy after having S. bovis isolated from sample biopsy. Associations with bacteremia were also demonstrated.

Abstract/Poster #: 40
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M1

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EXPLORING SPIRITUAL AUTONOMY IN THE TREATMENT OF AGGRESSIVE LYMPHOMA: A CASE REPORT

INTRODUCTION: This case highlights the complex interplay between spiritual autonomy and evidence-based care in a patient with aggressive lymphoma. It demonstrates how deeply held religious beliefs can guide medical decision-making and create ethical tensions when patients decline standard treatments with life-prolonging potential.

CASE PRESENTATION: A 43-year-old woman with GERD presented to a Midwestern medical center with two months of worsening fever, malaise, fatigue, myalgias, and arthralgias. Lymph node and bone marrow biopsies confirmed hemophagocytic lymphohistiocytosis (HLH). She was treated with dexamethasone but ultimately stopped therapy after discharge, opting instead for natural remedies, including lime water. Repeat biopsy revealed high-grade T/NK cell lymphoma, and she was started on chemotherapy. Her hospitalization was complicated by encephalopathy and hemorrhagic shock requiring intubation due to an upper GI bleed. Three weeks later, the day before her second chemotherapy cycle, she decided she no longer wanted treatment. Extensive discussions were held regarding risks, benefits, disease trajectory, and prognosis without therapy, yet she remained firm in her decision. Her course was further complicated by cardiac arrest in the setting of polymorphic ventricular tachycardia, with a magnesium level of 1.6; she had repeatedly declined magnesium supplementation. Throughout admission, the patient and her sister expressed a strong preference for holistic and integrative modalities, citing fears of medication interactions and a belief that such interactions contributed to their father's death. Providers grew uneasy about treating her low blood counts with continuous transfusions in the context of her refusal of curative therapy, prompting an Ethics consult. The patient identified as a "traditional Catholic," finding comfort in prayer and the Anointing of the Sick. She expressed no fear, describing anxiety as "from the devil," and voiced deep trust in God's plan. She believed spiritual healing was occurring and requested intermittent fasting to "starve cancer cells." She ultimately left against medical advice, acknowledging the natural course of untreated lymphoma but expressing a stronger desire to pursue homeopathic treatment.

CONCLUSION: This case illustrates the ethical challenges of respecting spiritual autonomy while providing evidence-based oncology care. A multidisciplinary approach, including Ethics, Chaplaincy, and Psychosocial Oncology, was essential to supporting the patient's values, ensuring clear communication, and promoting dignity and understanding.

Abstract/Poster #: 41
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

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Bartholomew Olash: Rush University medical center, Chicago, IL Dr. Carlos Santos: Rush University medical center, Chicago, IL

RECURRENT, DISSEMINATED NOCARDIOSIS IN AN IMMUNOCOMPROMISED PATIENT

INTRODUCTION: Nocardia is a genus of slow-growing, gram-positive, partially acid-fast filamentous bacilli commonly present in soil and decaying organic matter. These organisms typically cause opportunistic infections in individuals with impaired cellular immunity. Based on available evidence, recurrence and treatment failure are frequent challenges in immunocompromised patients. Diagnosis can be challenging, as presenting symptoms are often non-specific and lesions in disseminated infection may be difficult to distinguish from other neoplastic or inflammatory processes.

CASE PRESENTATION: This report describes a rare case of recurrent, disseminated nocardial infection in an immunocompromised patient who had recently undergone solid organ transplant. The patient had previously completed a course of trimethoprim-sulfamethoxazole and linezolid, with repeat imaging at two months of treatment and at hospital admission demonstrating resolution of previous cavitary and nodular consolidations, leaving only a residual cavitary lesion. Uniquely, this case suggests recurrence at a distant site despite resolution at the primary site. Malignancy was favored pending culture data based on initial radiographic impressions. Empirical therapy included trimethoprim-sulfamethoxazole and imipenem, with adjustments made based on susceptibility profiles, prior therapeutic response and adverse effects.

CONCLUSION: This case highlights the intricacies of diagnosing and managing nocardial infections, particularly in immunocompromised patients. Recurrence and treatment failure may occur despite appropriate, culture-directed therapy, underscoring the necessity for individualized management and sustained clinical vigilance. Clinicians should maintain a high index of suspicion for atypical presentations, and tailor antimicrobial regimens to individual patient risk factors and susceptibility results. Further prospective research is essential to determine optimal treatment durations and develop strategies to prevent recurrence, ultimately improving patient outcomes in this vulnerable population.

Abstract/Poster #: 42
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Chinyere Onyeukwu, MD
Chinyere Onyeukwu, MD (Rush); Jonatan Barreto, MD (Rush); and Ruta Rao, MD (Rush)

ASYNCHRONOUS CONTRALATERAL BREAST CANCER IN A MALE PATIENT

INTRODUCTION: Male Breast Cancer (MBC) is rare, accounting for only 1% of all breast cancer cases, but its incidence is rising globally. MBC is typically diagnosed later in life and is associated with higher mortality than female breast cancer, largely due to delayed detection. Research is limited, but MBCs frequently show high expression of estrogen receptors (ER+), observed in about 90% of cases. We report a unique case of a male patient presenting with a new primary breast malignancy 32 years after successful treatment of his initial breast cancer, highlighting the importance of lifelong awareness and surveillance in MBC survivors.

CASE PRESENTATION: A 68 year old male, with history of left breast cancer treated three decades prior, presented after discovering a mass behind his right nipple. Imaging identified a 1-cm mass. Pathology from a lumpectomy and sentinel lymph node biopsy confirmed a 9mm, Grade 2 invasive ductal carcinoma with micropapillary features. The tumor exhibited a high receptor positivity (ER 90%, PR 60%) and was HER2-negative. Margins and sentinel nodes were clear. Despite a known family history of malignancy, extensive 34-panel genetic testing, including BRCA1/2, was negative. The patient's treatment included re-excision, radiation therapy, and Tamoxifen. He will follow up with breast surgery, medical oncology, and radiation oncology for post-treatment evaluation later this year.

CONCLUSION: Male breast cancer (MBC) is rare (1% of all breast cancers) and associated with lower survival rates (5-year survival 40-65%) compared to female patients, often due to delayed diagnosis. While our patient presented younger than the typical age (>65) and lacked common genetic risk factors, his tumor was ER-positive and presented as a common subareolar mass. This case reinforces that, despite limited research to guide formal screening, providers must obtain thorough histories to assess risk factors. The potential for asynchronous recurrence decades later highlights the critical need for continuous, vigilant surveillance in all MBC survivors, regardless of prior negative genetic testing.

Abstract/Poster #: 43
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Melissa Petito, BA
Melissa Petito, Marco Metry, Dina Nashed, Kirin Saint

A BLISTERING SURPRISE: ATYPICAL PRIMARY VARICELLA IN AN UNCERTAINLY IMMUNE ADULT

INTRODUCTION: Diagnosing varicella-zoster virus (VZV) infections in adults can be challenging, particularly when patients lack a clear history of prior varicella infection or vaccination. Although primary varicella is typically considered a childhood illness, a growing number of adults remain unvaccinated or uncertain of their immunity status. In these individuals, VZV exposure can lead to rapid or atypical clinical presentations. This case highlights the diagnostic uncertainty that arises when immunity is unclear and underscores the importance of early recognition and timely antiviral therapy in adult VZV infections.

CASE PRESENTATION: A 44-year-old woman with no significant past medical history presented to the outpatient clinic with a diffuse blistering rash. She first noticed vesicular lesions on her left arm and right flank six days prior, which quickly progressed to involve her entire body without a recognizable dermatomal pattern. The lesions were non-painful and non-pruritic but caused discomfort. She reported a fever the night before presentation and noted recent exposure to VZV through her husband, who had been diagnosed with shingles one month earlier. She was unsure whether she had chickenpox as a child and was uncertain of her vaccination status. Vesicular fluid was collected for VZV PCR testing, and due to concern for disseminated VZV infection, she was referred to the emergency department for further evaluation. She was admitted and started on intravenous acyclovir. Infectious disease specialists recommended serologic testing, which revealed negative VZV IgG and a positive VZV PCR, supporting a diagnosis of primary varicella infection. She was advised to discuss her childhood history with family members, who all confirmed that she had never had chickenpox. Based on clinical improvement and diagnostic results, intravenous acyclovir was discontinued and transitioned to oral valacyclovir for a 7-10-day course. She was discharged in stable condition with instructions to maintain home isolation until all lesions had crusted. At follow-up one week later, she demonstrated significant improvement with widespread crusting of lesions.

CONCLUSION: This case emphasizes the need for clinicians to consider primary VZV infection in adults presenting with diffuse vesicular eruptions, particularly when immunity status is unknown, and highlights the value of early diagnostic testing and appropriate antiviral management.

Abstract/Poster #: 44
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

Nicholas Pizzo, BS
Nicholas J. Pizzo (Rush); Tejas C. Sekhar (Rush); Praewpailin Rich (Rush); Rishabh Gupta (Rush); Sara Fard (Rush); Elizabeth Berry-Kravis (Rush)

FEASIBILITY AND TOLERABILITY OF INTRAVITREAL CERLIPONASE ALFA IN CLN2 DISEASE: A PEDIATRIC CASE REPORT

INTRODUCTION: Intracerebroventricular (ICV) cerliponase alfa is an FDA approved therapy to slow neurologic decline in CLN2, a rapidly progressive pediatric neurodegenerative disorder. However, ICV infusions do not adequately address vision loss, which has prompted emerging off-label use of intravitreal enzyme replacement therapy (IVT ERT). We sought to describe the delivery and tolerability of IVT ERT in a pediatric patient with CLN2, as published clinical experience with this approach has not been reported to our knowledge. This case provides clinically relevant and practical insight into the coordination of interdisciplinary services required to integrate IVT ERT into CLN2 management.

METHODS: We conducted a retrospective Epic chart review of a 6-year-old boy with CLN2 who had received biweekly cerliponase alfa for two years before initiating monthly IVT ERT at our institution. Six IVT visits were reviewed to assess perioperative workflow, day-of ophthalmic assessments, and complications observed during injection or documented at follow-up. All IVT injections occurred under general anesthesia, consistent with routine pediatric practice. Baseline optical coherence tomography (OCT) imaging was reviewed to document pretreatment retinal structure.

RESULTS: Across six IVT visits over 5.5 months, the patient demonstrated good procedural tolerance, no intraocular inflammation, and one self-limited subconjunctival hemorrhage noted at follow-up. Pre-op assessments consistently demonstrated normal slit-lamp and fundus exam findings, mild fluctuations in IOP (12-19), and an increase in C/D from 0.3 to 0.4 and stable RPE mottling. A baseline OCT obtained prior to the first IVT injection demonstrated normal retinal architecture. Although same-day ICV/IVT ERT required coordinated efforts across neurology, ophthalmology, anesthesia, pharmacy, and infusion services, it remained feasible and was well tolerated by the patient.

CONCLUSION: Our preliminary results are consistent with good tolerability of IVT ERT and highlight the feasibility of same-day multimodal ERT administration in a pediatric patient with CLN2. Given the novelty of IVT therapy for CLN2-associated retinal degeneration, longitudinal follow-up and additional clinical data will be essential to better define its long-term safety profile and therapeutic impact.

Abstract/Poster #: 45
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Hilary Rettrey, MD
Hilary Rettrey

FACTITIOUS DISORDER: A CASE REPORT

INTRODUCTION: Factitious disorders are intentionally feigned, exaggerated, or self-induced symptoms or disease. Patients are conscious of their behaviors, but often unconscious of the underlying motivation. Patients often exhibit pseudologia fantastica, a form of pathological lying. It is important to identify and document patients with a factitious disorder as they can have a high financial impact on the healthcare system, psychological impact on the health care team, and risk of iatrogenic harm and even fatality to patients. This case report describes a 24-year-old female admitted with suspected factitious disorder.

CASE PRESENTATION: The patient is a 24-year-old female with medical history of SLE, Ehlers-Danlos, adrenal insufficiency, mood disorder, ADHD, APLS, POTS, asthma, upper extremity DVT, pancreas divisum, with port and GJ tube was admitted to the ICU for acute hypoxic respiratory failure requiring intubation during transfer from OSH for intrathecal pump placement by the pain service. Psychiatry was consulted due to panic attacks which was the reported cause of patient requiring intubation during transfer. On interview, the patient shared a long history of panic and anxiety attacks stating she has "tried everything on the market and nothing has worked." The patient and family also detailed a complex history with the medical system and framed all past hospitalizations and experiences as "horrible and harmful." They hoped that someone would "finally be able to help them." A thorough chart review brought forth the concern of possible factitious disorder which was then documented. After providing recommendations and detailed chart view, the psychiatry consult service signed off. The intrathecal pain pump was placed. After the procedure, the patient remained in the hospital for over a week due to continued pain that was difficult to manage.

CONCLUSION: This case highlights the importance of identifying and understanding factitious disorders by multidisciplinary teams. It also brings forth the need for teams to work together to mitigate the burden patients place on the health care team. Finally, it emphasizes the complexities in treating patients with factitious disorder in a way that respects patient autonomy but also prevents additional potential harm to the patient.

Abstract/Poster #: 46
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Shwetha Sekar, BS
Shwetha Sekar (Rush); Jonathan Kaplan (Rush)

UNMASKING RARE SSRI HEPATOTOXICITY: SEVERE TRANSAMINITIS TRIGGERED BY ESCITALOPRAM

INTRODUCTION: Escitalopram, although regarded as one of the best-tolerated SSRIs, can cause idiosyncratic drug-induced liver injury (DILI). While antidepressant-induced liver injury is uncommon, 0.5%-3% of patients may experience mild, asymptomatic elevations in serum aminotransferases. We present a case of a woman who developed marked transaminitis following an escitalopram dose increase for anxiety management.

CASE PRESENTATION: A 57-year-old female with Stage IV small cell neuroendocrine cancer receiving tarlatamab immunotherapy presented to the Rush Supportive Oncology Clinic for anxiety management. Due to worsening anxiety, her escitalopram dosage was increased from 5 mg to 10 mg. Five days later, she presented to an outside emergency department with severe anxiety, flushing, dyspnea, and chest tightness. Laboratory evaluation revealed AST 1383, ALT 972, and ALP 549 with normal bilirubin. This was a marked increase from baseline liver function tests on 1/2/25 (AST 24, ALT 46, ALP 86). Her last escitalopram dose was taken yesterday, and her most recent tarlatamab infusion was several weeks prior. Escitalopram was discontinued, and she was transferred to Rush for further evaluation. On admission, the patient was alert and oriented, without jaundice, scleral icterus, asterixis, or edema. Repeat testing the next day demonstrated improved transaminases (AST 395, ALT 598, ALP 538). By discharge on 1/14/24, liver enzyme values had further declined (AST 129, ALT 351, ALP 436). Liver function normalized without intervention other than stopping escitalopram. The temporal association with dose escalation, negative viral serologies, unremarkable abdominal ultrasound, and prior tolerance of tarlatamab supported escitalopram-induced liver injury as the most probable etiology. The patient was discharged with instructions for serial liver enzyme monitoring and follow-up with oncology and psychiatry. Tarlatamab was continued without recurrence of liver injury.

CONCLUSION: This case illustrates acute escitalopram-induced liver injury in a patient with advanced neuroendocrine cancer. Transaminase elevations occurred shortly after dose escalation and improved rapidly after drug discontinuation. Alternative causes, including tarlatamab hepatotoxicity, viral hepatitis, and biliary obstruction, were excluded. The case underscores the importance of monitoring liver function during antidepressant therapy and shows that prompt recognition and discontinuation of the offending agent can result in rapid recovery.

Abstract/Poster #: 47
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: Clinical Resident

Naomi Sequeira, MD
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COMPLEX MANAGEMENT OF TREATMENT-REFRACTORY MANIA: LESSONS FROM A THREE-MONTH ADMISSION

INTRODUCTION: First-line treatment for acute manic episodes involves a combination of mood stabilizers and antipsychotics with a corresponding average episode duration of 7 weeks (1). We present a case of acute mania with psychotic features involving multiple failed treatments, valproate toxicity, and an aberration in drug metabolism resulting in prolonged hospitalization.

CASE PRESENTATION: Patient is a 22-year-old male with bipolar 1 disorder who presented to the ED with hyper-verbosity, psychomotor agitation, mood lability, hyper-religiosity, delusions of grandeur, and ego-dystonic suicidal and homicidal thoughts. Home medications included lithium 1200 mg nightly and olanzapine 10mg nightly. During admission, olanzapine was increased to 30 mg and lithium to 1500 mg. Quetiapine, haloperidol, valproate, and paliperidone were also trialed. The combination of valproate and lithium provided the most improvement, but he subsequently became delirious with development of hyperammonemia and hyperlactatemia with a serum valproate level of 101.0. His ammonia and lactate levels improved after stopping valproate and administering levocarnitine. Valproate was gradually re-challenged concomitant to levocarnitine, but the delirium and lab findings recurred even at a lower dose, leading to valproate discontinuation. Patient completed 10 sessions of electroconvulsive therapy (ECT) with significant clinical improvement. He was discharged on paliperidone palmitate 234 mg injection monthly, temazepam 15 mg nightly, lithium 900 mg nightly, quetiapine 300 mg nightly, and maintenance ECT. Lithium level on this regimen was 0.89. Pharmacogenomic testing eventually showed poor metabolization of CYP2D6 and intermediate metabolization of CYP2C9 and UGT2B15. Serum quetiapine level was < 10 despite therapeutic dosing.

CONCLUSION: The case illustrates the complexity of managing treatment-refractory mania, complicated by unique medication side effects contributing to a 3-month hospital admission. The rapid onset of valproate-induced hyperammonemia even at subtherapeutic dosing, later explained by CYP2C9 intermediate metabolizer status, supports the evidence that genetic and metabolic factors may play a significant role in valproate tolerability (2). Subtherapeutic quetiapine serology remains inexplicable. This case underscores the value of maintaining a low threshold for considering metabolic factors when adverse effects arise early or at low doses, which may help prevent avoidable complications and prolonged hospitalizations.

Abstract/Poster #: 48
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

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A DIAGNOSTICALLY CHALLENGING CASE OF PULMONARY HISTOPLASMOSIS

INTRODUCTION: Pulmonary histoplasmosis is prevalent in the Midwest and presents a diagnostic challenge due to its often non-specific clinical manifestations and imaging findings. In this report, we present a diagnostically complex case of pulmonary histoplasmosis requiring surgical biopsy for confirmation.

CASE PRESENTATION: A 47-year-old non-smoking male with a history of HTN, T2DM, and HFpEF presented with 6 months of night sweats, 15-pound unintentional weight loss, and progressive dyspnea. An initial chest CT scan revealed enlarged hilar lymph nodes and ground-glass pulmonary nodules. Follow-up CT scan four months later demonstrated stable bilateral non-calcified lung nodules and persistently enlarged hilar lymphadenopathy. Serologic testing showed positive Histoplasma antibodies, prompting initiation of itraconazole. PET-CT was also obtained due to concern for malignancy and demonstrated numerous metabolically active mediastinal and hilar lymph nodes. Endobronchial ultrasound (EBUS) with bronchoalveolar lavage (BAL) was negative for malignancy, and lymph node biopsy revealed granulomatous inflammation. Further infectious workup was negative, including testing for Coxiella burnetii, Blastomyces dermatitidis, acid-fast bacilli (AFB), and Histoplasma urinary antigen. Itraconazole was discontinued due to the latter result. He was ultimately hospitalized for surgical excisional lymph node biopsy due to ongoing clinical decline from acute on chronic respiratory failure. BAL studies-including viral and fungal panels, Legionella, Pneumocystis, tuberculosis PCR, galactomannan, cytology, and all cultures-were negative. Left lower and upper wedge resection was performed, and histopathology of lung tissue confirmed the diagnosis of Histoplasmosis. Itraconazole was resumed, and on follow-up, repeat chest CT imaging showed marked improvement with mild residual scarring.

DISCUSSION: This case underscores the diagnostic complexity of pulmonary histoplasmosis, particularly when imaging and laboratory studies yield equivocal results. Moreover, in this case, there was a contradictory result of positive Histoplasma antibodies and negative Histoplasma antigen. As such, definitive diagnosis required histopathologic or culture-dependent confirmation of narrow-based budding. In summary, persistent symptoms and inconclusive testing warranted surgical resection, which ultimately led to diagnostic confirmation. Therefore, lung biopsy is imperative in cases where clinical suspicion remains high but non-invasive diagnostics are discordant.

CONCLUSION: This case highlights the importance of integrating serology, imaging, and tissue diagnosis-especially when non-invasive testing is inconclusive. Timely recognition and appropriate antifungal therapy are crucial for achieving favorable outcomes.

Abstract/Poster #: 49
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M3

Tarin Tanji, MPH
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SUDDEN UNILATERAL SENSORINEURAL HEARING LOSS AND VERTIGO AS A PRESENTATION OF PONTINE INFARCT: A CASE REPORT

INTRODUCTION: Sensorineural hearing loss (SSNHL) is most commonly idiopathic or due to primary otologic pathology. Vertigo may accompany SSNHL due to concurrent inner ear involvement. When SSNHL and vertigo occur alongside focal neurologic symptoms (e.g., diplopia, dysarthria, ataxia), central nervous system (CNS) pathology should be considered, particularly vertebrobasilar ischemia. However, the absence of such symptoms does not exclude CNS etiology. We present a case of a postoperative SSNHL and vertigo without additional neurologic deficits, highlighting its diagnostic considerations and management.

CASE PRESENTATION: A 54-year-old female with renovascular hypertension, type 2 diabetes, and left renal artery stenosis, underwent left renal artery angioplasty and stenting. On awakening from anesthesia, she developed acute left-sided hearing loss, vertigo, and nausea, without other focal neurologic deficits. ENT evaluation and audiogram confirmed left-sided SSNHL. Initial MRI of the internal auditory canals was unremarkable. She started a guideline-based prednisone taper for idiopathic SSNHL. On hospital day 9, due to persistent symptoms, MRI revealed a punctate acute infarct in the left ventral paramedian pons with subtle T2 hyperintensity; MRA demonstrated bilateral carotid atherosclerosis and mild-to-moderate basilar artery stenosis. She was started on aspirin and high-intensity statin therapy and referred to stroke follow-up.

CONCLUSION: SSNHL with vertigo, even without other focal neurological deficits, can signal posterior circulation stroke. Although the vascular etiology was central (pontine infarct and mid-basilar stenosis), the hearing loss is most consistent with a peripheral cause: cochlear ischemia from AICA hypoperfusion due to blood pressure fluctuations. The pontine infarct is localized to the corticospinal tracts, and may represent a bystander lesion and a surrogate marker of hypoperfusion, rather than the cause of hearing loss. Clinicians should maintain a broad differential for SSNHL, including both peripheral and central causes.

Abstract/Poster #: 50
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

Jules Tsanang, BA
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A RARE CASE OF ARRHYTHMOGENIC CARDIOMYOPATHY

INTRODUCTION: Arrhythmogenic cardiomyopathy (ACM) is a rare, inherited cardiac disorder characterized by progressive replacement of healthy myocytes with fibrous and adipose tissue. This pathological remodeling predisposes patients to ventricular arrhythmias, heart failure, and even death.

CASE PRESENTATION: A 66-year-old female with a history of hypertension, dysautonomia, seizure disorder, SLE, bilateral breast cancer, and thyroid cancer that was treated with a thyroidectomy presented with chest pain, exertional dyspnea, ankle swelling, and fatigue. Her high-sensitivity troponin-I (hs-cTnl), B-Type natriuretic peptide (BNP), and TSH were 34.8, 166, and 0.009, respectively. A point of care ECG showed anterolateral T wave inversions; there was no evidence of arrythmia on telemetry. Chest CT angiogram demonstrated a calcium score of 0 and ruled out pulmonary embolism or mass. Outpatient follow up demonstrated an ongoing rise in BNP and hs-cTnl levels despite normalization of thyroid function labs. These findings prompted assessment with cardiac MRI, which identified, "ring-like" mid wall enhancement in the septum, mid anterior, apical anterior, and apical inferior walls where the enhancement extended into the subepicardial tissue. Intra-myocardial fat was visualized in the apical portion of the septum suggestive of fibrofatty replacement. These findings were consistent with either arrhythmogenic cardiomyopathy (ACM) or desmoplankin cardiomyopathy (DSP). However, no high-risk genes were identified with genetic testing.

DISCUSSION: Symptoms of ACM and DSP are often nonspecific and exhibits a male predominance (2-3:1). 90% of patients demonstrate ECG abnormalities such as T-wave inversions in leads V1-V3, while echocardiography and MRI reveal right ventricular dilation, wall thinning, and intramyocardial fat deposits. This patient's presentation was atypical due to her female sex, lack of arrhythmias, and inconclusive genetic results**.** However, the MRI findings and persistent biomarker elevation were consistent with ACM vs. DSP pathology. Updated guidelines on ACM and DSP cardiomyopathy diagnosis upholds that cardiac MRI remains a helpful diagnostic tool in combination with other clinical findings. Additionally, the persistently elevated BNP in this patient aligns with emerging reports linking natriuretic peptide elevation to ACM, though the mechanism remains unclear. This case highlights the importance of considering ACM in patients with unexplained cardiac biomarker elevation and characteristic imaging findings, even when genetic testing is inconclusive.

Abstract/Poster #: 51
Session: Poster Presentation
Theme: Clinical Practice I: Case Studies
Trainee Rank: RMC: M2

Abdul Adnan Vhora, BS
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BENCH PRESS-INDUCED PECTORALIS MAJOR RUPTURE REPAIRED WITH ARTHROFLEX DERMAL ALLOGRAFT AUGMENTATION: A CASE REPORT

INTRODUCTION: Pectoralis major ruptures are uncommon injuries, classically seen in young male athletes performing maximal bench press. While acute tendon avulsions are generally amenable to primary repair, complete ruptures with musculotendinous junction tears present a reconstructive challenge due to insufficient tendon length for secure fixation. In these cases, biologic augmentation is often required. Dermal allografts offer a tension-restoring scaffold without donor-site morbidity and may improve outcomes when direct repair is not feasible.

CASE PRESENTATION: A 29-year-old healthy recreational weightlifter experienced a sudden "pop" while bench pressing 275 lb, followed by pain, weakness, and anterior chest ecchymosis. Examination showed loss of the anterior axillary fold and a retracted pectoralis contour. MRI demonstrated a complete rupture of the sternal head of the PM at the musculotendinous junction with no repairable tendon. Given the patient's age and athletic demands, dermal allograft augmentation was selected. Through a deltopectoral approach, a 3-mm acellular dermal matrix was used to bridge the defect and secured to the humerus using unicortical PecButtons and labral tape sutures. Postoperative recovery was uncomplicated. By 3 months, the patient achieved full, symmetric range of motion and strength, and MRI confirmed successful graft incorporation, with no re-rupture or complications.

CONCLUSION: Musculotendinous PM ruptures often preclude primary repair due to absent tendon length. Dermal allograft augmentation provides a biologically integrative solution that restores length, strength, and contour while avoiding donor-site morbidity. This case demonstrates successful functional recovery using dermal matrix reconstruction in a high-demand patient and supports its use as a viable option when direct repair is not possible.

Abstract/Poster #: 52
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M3

Mohammed Ali, BA
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ENGAGE, EMPOWER, EVALUATE (E3): THE ASSOCIATION OF SOCIAL DETERMINANTS OF HEALTH TO BASELINE HYPERTENSION CONTROL AND MEDICATION ADHERENCE IN A CLINICAL TRIAL PAIRING A MULTIDISCIPLINARY BLOOD PRESSURE INTERVENTION TO A SOCIAL NEEDS INTERVENTION

BACKGROUND: Cardiovascular disease (CVD) remains a leading cause of early mortality, especially on Chicago's West Side. Racial disparities in hypertension (HTN) and CVD are driven in part by social determinants of health (SDOH), which current screening tools capture inadequately due to issues in question framing, categorization, and patient privacy concerns. This study reports baseline findings from a multidisciplinary intervention integrating remote blood pressure monitoring with social needs support for underserved populations. We examined relationships between SDOH burden, medication adherence, and initial systolic blood pressure (SBP).

METHODS: In a 12-week feasibility study, adult Black and/or Hispanic patients with uncontrolled HTN (clinic BP >140/90 on two occasions) were enrolled. Exclusions included dialysis and post-transplant patients. The intervention team comprised a community health worker, RN, pharmacist, and LCSW. Baseline surveys assessed SDOH (financial strain, housing, food insecurity, healthcare access, stress, transportation, and social support) and medication adherence (ARMS scale). Participants were stratified by SBP (130-139, 140-149, 150-159, ≥160 mmHg) and SDOH needs (0, 1-2, ≥3). Associations were analyzed using Kruskal-Wallis and Wilcoxon rank tests.

RESULTS: Of 308 participants (mean age 58; 67% female; 83% Non-Hispanic Black, 17% Hispanic), 69% reported ≥1 SDOH need and 30% reported ≥3. Average SBP was slightly lower among those with more reported needs (151.9 mmHg for ≥3 needs vs. 153.9 mmHg for none; p=0.29), though not significant. Similarly, patients with SBP ≥160 had fewer reported SDOH needs on average than those with SBP <150 (1.7 vs. 2.1; p=0.25). However, higher SDOH burden correlated significantly with lower medication adherence (p=0.04) and refill adherence (p<0.01).

CONCLUSION: No clear baseline association emerged between SBP and reported SDOH needs, but greater SDOH burden predicted poorer adherence. Notably, no participants reported healthcare access barriers despite observed nonadherence, suggesting underreporting or tool limitations. Refining SDOH screening with input from interprofessional teams may enhance accuracy and impact. Future work should emphasize trust-building during screening and include broader BP ranges to improve assessment and intervention outcomes.

Abstract/Poster #: 53
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Nurudeen Alli, BA
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FEASIBILITY, SAFETY, AND OUTCOMES OF SINGLE-PORT ROBOT-ASSISTED NEPHROURETERECTOMY

INTRODUCTION: Upper tract urothelial carcinoma (UT-UCC) is an aggressive malignancy historically managed with radical nephroureterectomy (NU). While multiport robot-assisted NU (MP-RANU) offers advantages over open surgery, data on single-port RANU (SP-RANU) remains limited. We aim to describe a single-institution's experience with SP-RANU and evaluate its feasibility, safety, and early outcomes.

METHOD: A retrospective review of SP-RANU procedures completed at a tertiary academic center was conducted. Demographic information, clinical data, tumor characteristics, operative details, and postoperative outcomes were recorded.

RESULTS: Between July 2022 and March 2025, six patients underwent SP-RANU (median age 74.5 years, IQR 66-77). Mean operative time was 332 minutes, mean estimated blood loss was 383 mL, a ndno intraoperative complications were reported. Median hospital length of stay (LOS) was 1.5 days (IQR 1-5). Two patients experienced Clavien-Dindo grade II complications, neither requiring reoperation. Five patients achieved negative oncologic margins and one patient developed distant nodal metastasis. There was an average reduction of 12 mL/min/1.73m2 in conclusion: eGFR between pre-op and discharge levels. Post-operatively, patients required a mean of 75.8 morphine milligram equivalents (MMEs), and two patients were discharged without opiates.

CONCLUSION: In this early single-center series, SP-RANU presents a safe and feasible surgical option for select patients with upper tract UCC. SP-RANU offers low intraoperative morbidity, preservation of renal function, modest opioid requirements, short LOS, and comparable short-term oncologic outcomes to MP-RANU. This data supports SP-RANU as a viable minimally invasive surgical option, with need for further evaluation in a larger comparative cohort.

Abstract/Poster #: 54
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

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LAPAROSCOPIC HERNIA REPAIR IS NOT PROTECTIVE AGAINST ASCENDING TESTIS IN CHILDREN: A NATIONAL COHORT ANALYSIS

INTRODUCTION: Ascending testis (AT) is a rare postoperative complication of inguinal hernia repair, often requiring additional surgical management with long-term impacts on testicular function and male fertility. We hypothesize that there is a lower incidence of AT following laparoscopic repair (LR) as compared to open repair (OR) of inguinal hernia due to reduced inflammation of the spermatic cord. We aimed to investigate this hypothesis in a large national cohort.

METHODS: Male patients (<18 years) who underwent either LR or OR for unilateral or bilateral inguinal hernia were identified in the Mariner PearlDiver database (2010-2022). Children with complicated hernias or congenital cryptorchidism were excluded. Prematurity was stratified as extreme preterm (<28 weeks) or preterm (28-36 weeks). The primary outcome was orchiopexy performed ≥30 days after hernia repair; secondary outcomes were hernia recurrence and 90-day surgical site infection. Kaplan-Meier analysis and multivariable Cox proportional hazards regression models adjusting for surgical approach, age, prematurity, and hernia laterality were used to estimate AT- and recurrence-free survival.

RESULTS: 76,151 children met study criteria, of which 8,259 (10.8%) underwent LR. In unadjusted analysis, AT occurred in 330 children (0.4%) within 3 years, with higher incidence after LR compared to OR (0.6% vs 0.4%, p=.008). Adjusted analysis further supported the association between LR and higher AT risk (HR 1.47, 95% CI: 1.15-1.85). Both preterm (HR 2.14, 95% CI: 1.35-2.44) and extreme preterm history (HR 2.56, 95% CI: 2.01-4.19) were associated with increased AT risk. Regarding secondary outcomes, LR demonstrated higher long-term hazard of recurrence (HR 1.82, 95% CI: 1.59-2.08), with older children (13-17 years) displaying progressively higher rates (HR 3.04, 95% CI: 2.46-3.52). Bilateral repair was associated with reduced recurrence risk (HR 0.66, 95% CI: 0.57-0.76). Surgical-site infection did not differ significantly between approaches (0.5% vs 0.5%, p=.638).

CONCLUSIONS: Contrary to our hypothesis, LR was not protective against AT, while prematurity was found to be significantly associated with increased rates of AT. As in previous studies, LR is associated with higher incidence of hernia recurrence. These findings should inform surgical decision-making and pre-operative discussions with family members, particularly in high-risk populations.

Abstract/Poster #: 55
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Hanna Aronovich, BA
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USE OF INTRALESIONAL GARDASIL-9 VACCINE FOR RECALCITRANT WARTS

INTRODUCTION: Verrucae (warts) are common benign tumors of the skin or mucosa caused by human papillomavirus (HPV) types 1-4. The intramuscular Gardasil-9 vaccine is approved for prophylaxis against the high-risk strains of HPV, but recent case reports and case series show efficacy of intralesional (IL) Gardasil-9 in treating benign HPV strains in verruca vulgaris patients. Intralesional Gardasil-9 may prove to be an effective third-line option for warts that have failed to respond to standard therapies such as cryotherapy and salicylic acid. Clearance is thought to occur through adaptive immune activation and cross-reactivity between vaccine-targeted and benign HPV types. This trial aimed to test whether IL-Gardasil-9 is safe and effective at clearing verruca in patients who have failed the standard of care.

METHODS: Full IRB approval and informed consent were obtained (IRB01-25042701). Patients were randomized 2:1 of those receiving IL-Gardasil-9 to those receiving sterile saline. Participants received up to three treatments spaced one month apart. A 0.3mL aliquot was injected intralesionally into one wart, or 0.1mL in up to three warts for more sensitive areas with less capacity for expansion. Photographs were taken before and after each visit.

RESULTS: After just one treatment of intralesional Gardasil-9, 3 of 8 patients (37.5%) achieved complete resolution and 4 of 8 (50%) achieved partial resolution of their warts. One patient was lost to follow-up. Clinical response was seen in both the injected wart and distal warts. Among partial responders, 3 of 4 (75%) achieved full clearance after two treatments, and 1 of 4 (25%) fully cleared after three. In the placebo arm, one patient improved partially, while others showed no change. Adverse effects included transient pain with injection, erythema, edema, fever, and granuloma formation.

CONCLUSION: Intralesional Gardasil-9 has shown to be an effective third-line treatment for recalcitrant warts. Implementation of immunotherapies like IL-Gardasil-9 shows a much quicker systemic response and the ability to clear multiple lesions distal to injection site. Patients may achieve rapid clearance with fewer office visits, have the benefit of impact on multiple lesions at once, and may minimize their out-of-pocket costs over time.

Abstract/Poster #: 56
Session: Abstract Only
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M3

Ethan Belnap, BS
Ethan Belnap BS, Stuart Chen MD

CLINICAL PRESENTATIONS OF STAT TRANSTHORACIC ECHOCARDIOGRAMS IN THE EMERGENCY DEPARTMENT

INTRODUCTION: As a crucial tool for assessing cardiac function, Transthoracic echocardiograms (TTE) are often ordered STAT in the Emergency Department (ED) to guide immediate management. However, the extent to which specific clinical presentations predict significant echocardiographic findings remains unclear. This study examines one year of ED STAT TTEs to identify the most common clinical presentations of STAT TTE orders and examine their association with the severity of cardiac findings.

METHODS: This retrospective review was conducted of all STAT TTE ordered from the ED at Rush University Medical Center in Chicago, Illinois, between July 1, 2023, and June 30, 2024. Data was extracted from electronic medical records. Echocardiographic findings were classified according to American College of Cardiology/American Heart Association (ACC/AHA) and American Society of Echocardiography (ASE) guidelines: systolic dysfunction was defined by ejection fraction, diastolic dysfunction by the 2016 JASE criteria, and valvular dysfunction by the 2020 ACC/AHA recommendations. Patient's presenting symptoms were elucidated through structured review of the history of present illness as documented in the electronic medical record. Statistical analysis was done using IBM SPSS Statistics version 30.0.0 (IBM Corp, Armonk, New York).

RESULTS: Of the 167 ED STAT TTEs valvular heart disease was present in 45% of patients at a mild-to-moderate level and in 1.8% at a severe level. Systolic dysfunction was observed in 16.2% of patients, and diastolic dysfunction in 23.4%. The most common presenting symptoms in patient receiving an TTE were chest pain (61.7%), shortness of breath (37.7%), palpitations (7.8%), and lightheadedness (6.0%). Among these, only shortness of breath and abdominal pain were significantly associated with increased odds of systolic dysfunction (odds ratio [OR] 3.81, p=0.003; OR 6.80, p=0.001, respectively). No presenting symptom was associated with diastolic or valvular dysfunction. Regarding laboratory values, elevated troponin (27.0%) and elevated B-type natriuretic peptide (24.0%) were strongly correlated with systolic dysfunction (OR 4.67, p<0.001; OR 7.39, p=0.001, respectively), whereas elevated D-dimer (12.6%) was not.

CONCLUSION: These results suggest that targeted use of STAT TTEs, guided by overall clinical context rather than single abnormal findings, may enhance diagnostic efficiency and optimize resource use in the emergency setting.

Abstract/Poster #: 57
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Tabitha Block, BS, MS
Tabitha Block, MS (Rush) Co-Authors: Robert Balk, MD (Rush); Elaine Chen, MD (Rush)

DESIGNING A NATIONAL REGISTRY-BASED CF STUDY: METHODOLOGICAL CHALLENGES, ADMINISTRATIVE BARRIERS, AND GUIDANCE FOR FUTURE INVESTIGATORS

INTRODUCTION: Highly effective modulator therapy (HEMT) has transformed the clinical trajectory of cystic fibrosis (CF), yet its impact on Pseudomonas aeruginosa infection and antibiotic burden at the individual patient level remains unclear. Recent studies demonstrate shifts in microbiome composition and reductions in P. aeruginosa sputum burden following HEMT, but patient-level patterns remain insufficiently characterized. To address this gap, we developed a retrospective study using the Cystic Fibrosis Foundation Patient Registry (CFFPR) to evaluate within-patient changes in P. aeruginosa colonization, pulmonary exacerbations, and antibiotic burden. While the comprehensive data request remains under review, the design process revealed substantial methodological and administrative barriers unique to national registry research. This abstract outlines those challenges to guide future investigators.

METHODS: We aim to describe the design and submission process of a CFFPR-based study and to identify key administrative and methodological barriers relevant to trainee-led registry research. We developed a retrospective cohort study protocol comparing clinical outcomes before and after HEMT therapy. The initial design examined a 12-month window surrounding therapy initiation. Preparation of the CFFPR Data Request Application required securing an IRB determination, a detailed data security plan, and justification for each variable. The study protocol was repeatedly refined to align the scientific aims with CFFPR privacy policies and data access constraints.

RESULTS: Study design evolution was driven by structural limitations intrinsic to de-identified national registry data. First, the inability to access exact encounter dates eliminated a precise 12-month comparison window and required shifting to calendar-year level analysis, introducing temporal bias. Second, to compensate for reduced data granularity, we incorporated surrogate variables such as "Type of Airway Culture" to approximate sputum production and clinical status. Third, the need to account for heterogeneous treatment histories prompted the addition of subgroup analyses based on prior HEMT exposure. These revisions, along with a prolonged multi-institutional review timeline, underscored administrative latency and data limitations as major barriers for trainees conducting registry-based research.

CONCLUSION: The design process demonstrated that national registry studies require substantial administrative preparation, early planning, and close mentorship. Recognizing privacy constraints, data granularity limits, and prolonged review timelines can help future trainees structure feasible, methodologically sound registry research proposals.

Abstract/Poster #: 58
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M3

Fedra Britvic, BA
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TECHNICAL FACTORS INCREASE THE RISK OF COMPLICATIONS AFTER PLASTIBELL CIRCUMCISION IN NEONATES

INTRODUCTION: While decreasing in volume, neonatal circumcision is one of the most commonly performed pediatric surgical procedures. Plastibells are commonly used in neonatal circumcision, and while previous research has demonstrated the safety of this technique over other methods, complications including bleeding and retained Plastibell can occur. This study aimed to evaluate the association between patient and surgical factors and post-procedural complications after Plastibell circumcision in a large single-institution cohort.

METHODS: A retrospective chart review was conducted of all patients undergoing Plastibell circumcision in the pediatric surgery department at a single academic institution between 2017-2022. Demographic and perioperative variables were extracted while procedural techniques were assessed via survey including questions regarding lidocaine method, Plastibell sizing, dorsal slit timing, extent of glans exposure, and management of loose ties. Outcomes assessed included complications such as retained Plastibell, bleeding, infection, adhesions, and inadequate or excessive skin removal. Comparative analyses were performed between patients with and without complications to identify risk factors for complications.

RESULTS: A total of 2,501 patients were included with a mean procedural weight of 3.7 kg. Overall, 75 (2.9%) infants had a complication, including 30 (1.2%) with retained Plastibell, 21 (0.8%) with penile adhesions requiring lysis, 11 (0.4%) with bleeding, 2 (0.1%) with infection, and 4 (0.2%) with inadequate skin removal. A complication of a retained Plastibell was significantly associated with the use of both ring and dorsal blocks, compared with using either technique alone ($p < 0.001$). It was also associated with lack of complete glans exposure and with management of a loose string by removing the existing tie and retying ($p < 0.001$ for each). Other procedural technique variables, including timing of dorsal slit and frequency of resident involvement in tying the Plastibell, were not significantly associated with post-procedural complications.

CONCLUSION: Plastibell circumcision is a safe procedure with a low overall complication rate. However, we conclude that surgeon-specific technical factors-particularly ensuring full glans exposure, and secure string management-significantly impact the risk of a retained Plastibell. Standardization of surgical technique may further reduce complications.

Abstract/Poster #: 59
Session: Oral Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: Clinical Resident

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EXTENT OF RESECTION MATTERS: PARTIAL VS. TOTAL THYMECTOMY AND OVERALL SURVIVAL IN EARLY-STAGE THYMOMA

INTRODUCTION: Optimal extent of resection for early-stage thymoma remains debated. Consensus guidelines generally recommend total thymectomy; contemporary series using minimally invasive cohorts have reported outcomes comparable to partial thymectomy.2 To address this uncertainty, we evaluated long-term survival after partial versus total thymectomy for early-stage thymoma in the National Cancer Database (NCDB).

METHODS: The NCDB was queried for adults diagnosed with WHO A-B3 thymoma from 2004-2023 who underwent partial or total thymectomy. Patients with lack of cancer-directed surgery, missing survival data, or incomplete variables required for staging were excluded. Masaoka-Koga stage was used between 2004-2015 and AJCC 8th edition TNM stage for 2018-2023. Early-stage disease incorporated Masaoka-Koga stage I-II or AJCC stage I. Two multivariable Cox models were constructed. The primary multivariable model included only pre-operative variables to isolate baseline factors influencing the choice of resection. These included age, sex, race, Charlson-Deyo score, prior cancer, neoadjuvant systemic therapy, and neoadjuvant radiation. A second model incorporated post-operative variables, including pathologic lymph node positivity, receipt of radiation, and systemic therapy, as a sensitivity analysis to assess the robustness of the findings.

RESULTS: Among 4,854 patients with complete staging information, 3,632 had early-stage disease. Of these, 74% were White, 54% identified as female, and 70% underwent total thymectomy. The median follow-up was 64 months (IQR 34-135). Median overall survival was 195 months (IQR 122-241). In unadjusted analysis, partial thymectomy was associated with worse survival compared with total thymectomy (HR 1.27; 95% CI, 1.08 - 1.50; p = 0.004). After adjustment for pre-operative variables, partial thymectomy remained independently associated with inferior survival (aHR 1.26; 95% CI, 1.07 -1 .49; p = 0.01). Older age, higher Charlson-Deyo score, Black race, and prior cancer were also associated with increased mortality, while female sex was protective. A sensitivity model incorporating post-operative treatment variables yielded consistent results (aHR 1.25 95% CI, 1.06 - 1.48, p = 0.01, Table 2). The log-rank test comparing Kaplan-Meier survival curves yielded a p-value = 0.004 (Figure 1).

CONCLUSION: In this nationally-representative cohort, encompassing two staging systems and over 15 years of surgical practice, partial thymectomy was independently associated with worse overall survival in patients with early-stage thymoma.

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ATOPIC DERMATITIS AS A RISK FACTOR FOR RETINAL DETACHMENT AND PROLIFERATIVE VITREORETINOPATHY IN A U.S. POPULATION

INTRODUCTION: Atopic Dermatitis (AD), commonly known as eczema, is a chronic inflammatory skin condition linked to a higher risk of ocular disease, including rhegmatogenous retinal detachment (RRD) and proliferative vitreoretinopathy (PVR) reported particularly in Asian populations; (Grewal et al. 2019; Choi et al. 2020). The mechanisms linking RRD and AD remain unclear, but studies have postulated consistent microtrauma like chronic eye rubbing and retinal structural weakness as contributing factors. One Japanese study demonstrated a decline in AD-associated RRD over two decades, suggesting improved dermatitis control may play a protective role in reducing the risk of RRD associated with AD (Sasoh et al. 2015). This study investigates whether AD is associated with an increased risk of RRD and PVR in a large U.S. clinical database.

METHODS: A retrospective cohort study was performed using the Vestrum Health database. Patients with a documented diagnosis of AD identified using a combination of ICD-10 codes, clinician exam notes reporting eczema, and records of eczema-related medication use, were matched to a control cohort without AD, based on key demographic and clinical characteristics. Cox proportional hazards regression models were applied to estimate the risk of RRD and PVR associated with AD. Methods used to identify RRD and PVR were consistent with those previously validated (Shepherd at al. 2024). To account for potential correlation between eyes of the same patient, both standard and mixed-effects Cox models were evaluated.

RESULTS: 12,472 eyes from patients with AD were compared to 37,416 control eyes without. Cox regression analysis showed patient eyes with AD had a lower risk of developing RRD (HR=0.54; 95% CI 0.43-0.68; $p < 0.001$). However, among eyes with RRD, those with AD showed similar trends.

CONCLUSION: Patients with a history of AD in this U.S. population do not have a higher risk of RRD but may have an increased risk of PVR after RRD. The lower rate of RRD may reflect improved AD management and/or a lower proportion of Asian patients in the cohort. Although the association with the PVR did not reach statistical significance ($p = 0.058$), the observed trend suggests that inflammatory mechanisms associated with AD may contribute to PVR pathogenesis after RRD.

Isabel Chris, BS
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OCCUPATIONAL EXPOSURE TO MICROPLASTICS IN HOSPITALS: A SYSTEMATIC REVIEW OF HEALTH RISKS AND KNOWLEDGE GAPS

INTRODUCTION: Advances in medical technology have dramatically expanded the use of plastic-based products in healthcare, inadvertently increasing healthcare workers' exposure to microplastics. Microplastics are defined as plastic particles <5 mm and are now recognized as an emerging occupational hazard. Recent studies demonstrate that microplastics are shed from numerous clinical products, including plasticizers, sutures, filtration materials, face masks, and single-use disposable devices, creating continuous exposure opportunities for clinicians, staff, and trainees. Although microplastics have been linked to cytotoxic, inflammatory, endocrine, and cardiopulmonary effects, the health implications of chronic occupational exposure remain poorly understood. The objective of this systematic review is to characterize existing evidence on healthcare-related microplastic exposures and highlight areas requiring urgent scientific and regulatory attention.

METHODS: A comprehensive literature search was developed by the authors and experienced medical librarians (SH, LJ, JW). The search was run on October 7, 2025, in the following databases: PubMed/MEDLINE, Scopus, and Google Scholar. Both controlled vocabulary (e.g., MeSH terms) and keywords in the title or abstract fields were searched. There were no restrictions on publication dates, age, geography, or language. Additionally, a hand search was conducted of reference lists of selected articles.

RESULTS: Preliminary findings demonstrate three primary exposure pathways for healthcare workers: inhalation of airborne microplastics from masks, gowns, and device manipulation; ingestion through hand-to-mouth transfer during clinical workflow; and dermal contact from repeated handling of plastic-based products. Documented biological effects include oxidative stress, inflammation, immune dysregulation, and endocrine disruption. However, the literature reveals substantial gaps regarding cumulative burden, long-term health outcomes, and specific risks associated with emerging polymer compounds and additives.

CONCLUSION: Microplastics represent a growing yet underrecognized occupational hazard for healthcare workers across diverse clinical environments. This review highlights the urgent need for improved exposure assessment, standardized definitions, more rigorous occupational surveillance, effective mitigation strategies, and targeted research to better understand and reduce microplastic-associated health risks.

Regan Curtis, BA
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RATES OF ULTIMATE CANCER DIAGNOSIS AMONG PATIENTS WITH INITIAL INSUFFICIENT SAMPLE ON ENDOMETRIAL BIOPSY

INTRODUCTION: Endometrial biopsy (EMB) is a commonly used, minimally invasive procedure for evaluating suspected endometrial pathology, including malignancy. However, EMB frequently yields insufficient samples, with reported rates ranging widely in the literature. Clinical management following an insufficient EMB result remains variable, particularly in urogynecology patients who often present with pelvic organ prolapse and abnormal bleeding. The true rate of ultimate malignancy in this patient population is not well established**.**

OBJECTIVE: To determine the rate of insufficient EMB sampling in a urogynecology population, evaluate the incidence of endometrial carcinoma following insufficient sampling, and identify patient factors associated with malignancy.

METHODS: A retrospective chart review was be conducted for all urogynecology patients who underwent EMB at Rush University Medical Center and Rush Oak Park Hospital between 2016 and 2024. Patients with insufficient biopsies were be evaluated for subsequent management (repeat EMB, hysterectomy, or no further intervention) and any diagnosis of endometrial carcinoma within 12 months. Demographic and clinical variables including age, vaginal bleeding, obesity, pessary use, personal and family cancer history, and transvaginal ultrasound findings were be collected and analyzed using descriptive statistics.

PRELIMINARY RESULTS: So far, of 58 completed eligible chart reviews, zero were diagnosed with endometrial carcinoma with in the subsequent 12 months. Risk factors such as advanced age, obesity, abnormal bleeding, and family history of cancer are still being analyzed and potentially linked to hyperplasia or pre-cancerous outcomes. Preliminary findings also show that many patients with an insufficient EMB ultimately underwent hysterectomy anyway (usually for prolapse or abnormal uterine bleeding). Furthermore, insufficient findings on repeated EMBs were not uncommon.

CONCLUSION: This study aims to clarify cancer risk following insufficient EMB among urogynecology patients and provide population-specific data to guide clinical decision-making. If data analysis continues to show low/nonexistent rates of malignancy among this patient subset or is able to link malignancy to a specific risk factor(s), these findings will be very valuable for providers to apply to their clinical decision making.

Abstract/Poster #: 63
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Brandon Deguzman, BS in Neuroscience
Brandon Deguzman (Rush), Angie Jung (Rush), Jessica Joyce (Rush), Neelum Aggarwal (Rush), and Laurel Cherian (Rush)

THE ROLES OF ANXIETY AND DIETARY HABITS IN POST-STROKE COGNITIVE IMPAIRMENT

INTRODUCTION: Post-stroke cognitive impairment (PSCI) is a debilitating stroke outcome affecting up to ~33% of survivors within 1 month of stroke. Two understudied elements potentially associated with PSCI include anxiety and diet. Anxiety has previously been associated with worse cognitive function, but this relationship is less well-described than that of depression. The MIND (Mediterranean-Dash Intervention for Neurodegenerative Delay) Diet, has previously been associated with reduced cognitive impairment in community-based samples of self-reported stroke survivors, but further characterization is needed in stroke outpatients and in relation to other PSCI risk factors. The present study investigates the relationship between PSCI, anxiety, and diet.

METHODS: Study staff assessed post-stroke outpatients at an urban academic medical center. Participants included stroke or TIA survivors aged >/=55 years with no preceding dementia and no current memory medications. Anxiety was measured with Generalized Anxiety Disorder 7-item (GAD-7, higher scores = more severe anxiety), MIND diet adherence was measured with MIND Diet Screener (higher scores = greater adherence), and PSCI was measured with Montreal Cognitive Assessment (MoCA, lower scores = greater cognitive impairment). Pre-stroke anxiety diagnosis was obtained from the medical record. Pairwise Pearson's r was calculated between assessment items.

RESULTS: Preliminary results for 22 participants included median GAD-7 of 2, median MIND Diet Screener of 7.75, and median MoCA of 23. 91% met criteria for cognitive impairment (MoCA <26), 73% reported non-zero post-stroke anxiety symptoms, and 18% who lacked pre-stroke anxiety developed mild or more severe anxiety post-stroke. Among the 64% with new post-stroke anxiety symptoms, MoCA scores varied inversely with GAD-7 scores (r(13)=-0.270, p=0.3300). No significant correlation was observed between the MoCA with either the GAD-7 (r(21)=0.002, p=0.9922) or the MIND Diet Screener (r(21)=0.031, p=0.8885). A non-significant association was observed between GAD-7 and Mind Diet Screener (r(21)=0.377), p=0.0760).

CONCLUSION: PSCI is highly prevalent in post-stroke survivors, with 91% of participants meeting criteria. Anxiety symptoms were also highly prevalent. Diet quality was moderate, showing potential to improve with nutritional intervention. Preliminary statistical analysis was limited by small sample size, with results not showing significant associations between diet, anxiety, and PSCI. Further analysis is planned as recruitment continues.

Abstract/Poster #: 64
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: Clinical Resident

Keri L Denson, MD
Thalía Casanova1*, Sierra R. Broad DO, MPH1*, Keri L. Denson MD1, Darren Nin PhD1, Eugene Bukenya MS1, Wara Naeem MD1, Gillian C. Alex MD1, Jonathan Waxman MD1, Michael J. Liptay MD1, Christopher W. Seder MD1, Ozuru Ukoha MD2, Nicole Geissen DO1

LANGUAGE DISPARITY IS ASSOCIATED WITH LONGER TIME-TO-TREATMENT IN NON-SMALL CELL LUNG CANCER

INTRODUCTION: Sociodemographic disparities have been linked to delays in treatment in non-small cell lung cancer (NSCLC). The objective of this study was to evaluate the impact of native language on time-to-treatment in NSCLC, hypothesizing that patients identifying languages other than English as their primary language experience a longer time-to-treatment compared to English-speaking patients.

METHODS: Patients who underwent lung resection for NSCLC between 2010-2022 across two institutions, a tertiary care center and a safety net hospital, servicing the same regional area were identified. Exclusion criteria included those who underwent neoadjuvant therapy, indeterminate N stage, metastatic disease, and unknown date of diagnostic imaging. Time-to-treatment was defined as the interval between the date of diagnostic imaging that prompted biopsy or treatment and surgical resection. Univariable and multivariable logistic regression assessed the impact of language on time-to-treatment. Multivariable analyses were adjusted for age, race, smoking history, institution, and clinical T stage.

RESULTS: A total of 1,030 patients met inclusion criteria, of whom 6.3% were non-English-speaking. The mean age was 69 years, 55.5% were female, 73.9% identified as White/Caucasian, and 90.3% were treated at the tertiary care center. The median time-to-treatment across the cohort was 36 days. On univariate and multivariate analysis, patients who identified a language other than English as their primary language experienced a longer time-to-treatment. Time-to-treatment was stratified into quartiles, with a median time-to-treatment of 85 [IQR 70-107] days in the 4th quartile compared to 29 [IQR 20-42] days in others, $p < 0.001$. Following risk adjustment, non-English native language (OR 2.05, 95% CI 1.10-3.82, $p = 0.025$), Black race, and treatment at the safety net hospital were independent predictors of treatment delay.

CONCLUSION: Language disparity is associated with delayed time-to-treatment in patients who undergo lung resection for NSCLC.

Abstract/Poster #: 65
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: CHS: MS

Alicia Fonseca, BS in Dietetics
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ALIGNING MIND DIET SCORING WITH LATIN FOOD PREFERENCES IN LATINO CORE PARTICIPANTS

INTRODUCTION: Alzheimer's Disease (AD) is the most the common form of dementia and the sixth leading cause of death in the US. Latinos have disproportionately higher risk of AD than other ethnic groups. The Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet has been associated with slower cognitive decline and reduced AD risk; however, most research has relied on predominantly non-Latino populations and dietary tools that capture limited food items. Little is known about how common Latin foods align with MIND diet components.

METHODS: Two dietary datasets were analyzed - one from NHANES 2017-2018 and the other from Rush (Memory and Aging Project) food frequency questionnaires (FFQ) to determine the most common foods reported by older Latino adults (> 60 years). Once identified, these foods were added to the validated Rush FFQ and administered to a sample of Latino CORE (LATC) participants in effort to confirm whether such items were consumed by these adults. Next, the nutrient composition of added foods was examined to assess whether the nutrient composition aligned with those of MIND food components. Finally, MIND scores (range 0-15; a higher score indicating a better diet quality), were computed for all participants, with further stratification by age, sex, and education.

RESULTS: We identified 15 commonly consumed food items not included in the original FFQ and incorporated them into the updated tool. From March 2024 to July 2025, 58 LATC participants completed the FFQ, with 51 providing valid responses (mean age 77.6 ± 6.6, 71% female, 35% < high school education). Frequently consumed food items (≥once/ week) included tortillas, (especially corn tortillas [62.1%]), avocados (55.1%), tacos (particularly chicken [39.7%]), hot peppers (27.5%), and salsa (most often pico de gallo [22.4%]). Based on nutrient composition, foods were added to the MIND diet components, e.g. whole wheat and corn tortillas added to the whole grains based on carbohydrate-to-fiber ratio. MIND diet score computation is ongoing and will be completed by January 2026.

CONCLUSION: Several foods commonly consumed among Hispanic older adults share nutrient profiles with key MIND diet components. Incorporating culturally relevant foods into FFQs is essential for accurately evaluating dietary patterns.

Ime Inyang, BA
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PREDICTIVITY OF WAIST-TO-HIP RATIO OF POSTOPERATIVE COMPLICATIONS IN AUTOLOGOUS BREAST RECONSTRUCTION

INTRODUCTION: When counseling patients for autologous breast reconstruction, it is important to discuss perioperative risk based on patient demographics. Waist to hip ratio (WHR), a measure of abdominal fat distribution, has been cited as a superior metric for determining surgical morbidity than often used body mass index (BMI). Our study seeks to elucidate the accuracy of this measure in predicting complications after autologous reconstruction.

METHODS: An IRB approved retrospective review study was conducted of patients undergoing autologous breast reconstruction at a single institution from 2015-2024. Patient demographic data, comorbidities, cancer treatment course, surgical techniques and complications were gathered. Height, weight, and BMI were collected from EMR records while waist and hip circumference was determined using preoperative computed tomography images. Statistical analysis and multivariate regression were conducted using JASP.

RESULTS: A total of 222 patients (327 breasts) were included. Complications occurred in 49 patients (22.1%). Following Fisher's exact test, patients experiencing complications had significantly higher BMI ($p=0.024$), weight ($p=0.027$), WHR ratios ($p < 0.001$), waist to height ($p=0.001$), use ADM (0.004), and were more likely to undergo immediate rather than delayed reconstruction (78.8% vs. 60.7%, $p = 0.013$). Interestingly, neoadjuvant radiation was found to be negatively associated with post operative complications in this population ($p=0.005$). However, after performing multivariable logistic regression, higher WHR ratio was the only independently associated with increased odds of complications ($OR = 2.85x10^5$, $p = 0.002$).

CONCLUSION: WHR ratio was found to be the only significant predictor of postoperative complications in autologous breast reconstruction, outperforming traditional measures such as BMI. Despite several factors showing significance on univariate analysis, only WHR remained significant on multivariable regression. These findings support the use of WHR as a valuable tool in preoperative risk stratification and patient counseling.

Solomon Isi, BS
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TABLE TENNIS AS NEUROLOGIC REHABILITATION (NEUROPONGTM PROGRAM) TO IMPROVE MOTOR FUNCTION IN PEOPLE WITH MULTIPLE SCLEROSIS

NTRODUCTION: Multiple Sclerosis (MS) is a chronic inflammatory and progressive neurodegenerative disease affecting approximately 1 million people in the United States. Table tennis is a multifaceted sport that simultaneously activates visuospatial processing networks in the brain, offering individuals with MS an interactive form of physical and cognitive stimulation.

METHODS: Eight participants were consented to be apart of the study, four of whom completed the intervention. We included patients that had an official diagnosis of MS and had the ability to consent to the study. We conducted a "NeurPong Program", which was a 12-week instructror-led table tennis program, which aimed to improve functionality.

RESULTS: Out of six enrolled participants, two dropped out due to conflicts with scheduling. Four participants completed the 12-week program. All 4 remaining participants showed improvements in motor function from baseline. The average T25FW test time decreased from 5.14 sec to 3.80 sec (p=0.002), representing a walking speed increase from 4.97 ft/sec to 6.94 ft/sec. The average 2MWT distance increased from 534.54 ft to 688.96 ft (p=0.013). Cohen's D analysis showed a strong effect size for average T25FW time (2.724), walking speed (-1.37) and average 2MWT distance (-1.48).

CONCLUSION: This study showed that NeuroPONG led to improvements in reaction time, balance and walking speed, as measured by 2-minute walk test and 25 ft walk test in patients with MS. Given our findings, NeuroPONG may be a promising intervention in a small sample to improve gait performance within this patient population.

Abstract/Poster #: 68
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: Clinical Resident

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PAGING PSYCHOSOCIAL ONCOLOGY: INFLUENCE OF SOCIODEMOGRAPHIC AND MEDICAL FACTORS ON TIME TO CONSULTATION AND LENGTH OF HOSPITALIZATION

INTRODUCTION: Individuals hospitalized with cancer benefit from psychosocial oncology consultation services (PCOS) for management of biopsychosocial needs. However, literature is limited in understanding the utilization, scope, and value of POCS. This project examined the influence of sociodemographic and medical factors on consultation timing and length of stay (LOS), and whether time to consultation was associated with LOS.

METHODS: Data on patients with cancer admitted to Internal Medicine service during 2024-2025 who were referred to POCS were abstracted from the electronic medical record, including: time to consultation, LOS, consultation reason, cancer diagnosis and staging, and sociodemographic characteristics. Consultation reason was iteratively coded using a directed content analysis approach. Non-parametric tests examined associations between patient characteristics, time to consultation, and LOS. Negative binomial regression examined the relationship between time to consultation and LOS, controlling for age, metastatic status, and leukemia diagnosis.

RESULTS: Of 304 consults, 262 were unique patients (M age=60, 64% female, 34% Black, 21% Hispanic/Latinx). On average, patients were hospitalized for 11.39 days (SD=9.85); consults were placed 4.92 days (SD=5.70) after admission. Consult reasons included cancer-specific coping (50%), psychiatric (30%), general coping (19%), care engagement (14%), and non-specific coping (10%) concerns. There were no associations between time to consultation or LOS and race, ethnicity, sex, cancer type, or metastatic status. However, older patients were more likely to be consulted later (M=5.54 days) and admitted longer (M=12.43 days) than younger patients (p-values<.05). Greater time to consultation was associated with longer LOS such that each additional day to consultation was associated with an 8.6% increase in expected LOS (B=.083, p<.001), independent of age, metastatic status, and leukemia diagnosis.

CONCLUSIONS: Findings suggest early involvement of POCS may support shorter LOS for hospitalized patients with cancer; other potential confounding factors will be discussed. Consultation delays for older adults warrants further exploration of facilitators and barriers to consultation. As POCS expand across hospital systems, more data are needed to characterize their utility and value in alignment with key performance indicators (e.g., LOS, re-admission rates, and patient satisfaction).

Abstract/Poster #: 69
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Joyce Jeong, BS
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ITERATIVE DEVELOPMENT OF AN ENVIRONMENTAL IMPACT LABEL FOR SINGLE-USE SURGICAL DEVICES

INTRODUCTION: Single-use disposable surgical devices (SUDSDs) contribute substantially to operating room waste, yet surgeons often lack accessible information about their environmental impact. Environmental Impact Labels (EILs) are conceptual tools designed to communicate sustainability metrics in a concise, interpretable format, similar to nutrition labels. This study describes the design and iterative development of EIL prototypes, focusing on design decisions made to optimize clarity, usability, and visual comprehension.

METHODS: EIL prototypes were developed through a collaborative, iterative process between the research team and a professional graphic designer. Four sequential design versions were produced. Early versions 1-3 were refined internally to optimize visual clarity, accessibility, and communication of sustainability concepts without participant exposure. The research team selected core metrics such as resource consumption, emissions/air quality, human health impact (ie. DALYs), and energy use based on their relevance to surgical disposables and availability. These metrics were incorporated into successive prototypes with progressively simplified layouts. The final Version 4 focused exclusively on disposable devices and incorporated a simplified, high-contrast layout with streamlined metric panels, serving as the print-ready prototype presented to participants for evaluation.

RESULTS: The iterative process allowed progressive refinement of visual hierarchy, color accessibility, icon standardization, and metric presentation. Early versions revealed challenges with readability, cognitive load, and interpretability, which informed adjustments in the final design. While Version 4 improved clarity, metric presentation, and visual simplicity, participants' feedback indicated areas for further refinement to enhance interpretability and usability.

CONCLUSION: The structured, iterative development of the EIL highlights the value of internal review and user-centered design in creating interpretable sustainability labels for surgical devices. Insights from the design process and participant feedback will guide continued refinement of the prototype, supporting future efforts to integrate sustainability considerations into surgical decision-making.

Abstract/Poster #: 70
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Nicole Kilada, BA
Nicole Kilada (RMC); Dustin Gulizia (RUMC); and Bulent Arslan (RUMC)

IMPROVING ADRENAL VEIN SAMPLING: ULTILIZING THE COMBINED ANGIO-CT HYBRID SUITE

INTRODUCTION: Adrenal vein sampling (AVS) remains a crucial tool in determining the course of treatment for patients presenting with primary hyperaldosteronism. Recent studies have focused on different techniques to improve AVS success rates. This study aims to evaluate the impact of combined Angio-CT hybrid suite on AVS procedures compared with fluoroscopy-only procedures. We hypothesized the use of MDCT for confirmation of adrenal cannulation would decrease procedure duration and radiation dose, while improving technical and diagnostic success.

METHODS: Retrospective, single-center review of all patients who underwent AVS from 2017 to 2025 at our academic institution. Patients were separated based on AVS procedures with or without hybrid Angio-CT use. Analyzed data included procedure duration, fluoroscopy and radiation exposure, and technical and laboratory success. Data was summarized using mean, range, and standard deviation. Fischer Exact and Mann-Whitney U tests were used to compare data between cohorts. P-values < 0.05 were considered statistically significant. Approval was received by the Institutional Review Board and informed consent was waived.

RESULTS: There were 53 patients who underwent AVS during the study period, 27 (50.9%) male and 26 (49.1%) female with a mean age of 55. A total of 33 (62.3%) patients underwent AVS with combined Angio-CT, and 20 (37.7%) patients without Angio-CT. No (0%) patients in Angio-CT cohort and 4 (20%) patients in the fluoroscopy-only cohort underwent repeat procedures; 2/4 (50%) repeat procedures were technically unsuccessful. For patients with combined Angio-CT, technical success was 31/33 (93.9%) compared with 13/20 (65%) in the fluoroscopy-only cohort, resulting in statistically significant improved success with the use of Angio-CT compared to fluoroscopy-only ($p=0.0189$). Procedure duration also significantly decreased ($p<0.00001$) for Angio-CT cases with a mean procedure time of 120.12 +/- 50.70 minutes compared with a fluoroscopy-only mean procedure time of 214.50 +/- 107.17 minutes. There was no statistically significant change in fluoroscopy time ($p=0.3843$) or radiation dose from fluoroscopy ($p=0.4237$). There were no (0%) immediate procedural complications in either cohort.

CONCLUSION: Use of a hybrid Angio-CT suite and adapted AVS technique results in significantly decreased procedure duration and improved procedural success.

Abstract/Poster #: 71
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Joo Yeon Kim, BA
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ANTIVIRAL TREATMENT FOR HOSPITALIZED ADULTS WITH INFLUENZA AMONG U.S. EMERGENCY DEPARTMENTS USING THE COSMOS DATABASE

INTRODUCTION: Early administration of an antiviral reduces influenza-related complications and multiple guidelines recommend prompt antiviral treatment for all hospitalized patients with influenza. However, there is limited data on adherence to recommended early antiviral treatment in clinical practice within the Emergency Department (ED). Therefore, our epidemiological study assesses temporal trends in the initiation of antiviral treatment for adults hospitalized with influenza in the ED and identifies factors associated with nonadherence.

METHODS: This retrospective cohort study investigated patterns of antiviral treatment among adults (age ≥ 18 years) hospitalized with influenza in U.S. EDs from January 1, 2016, to December 31, 2024, using the Epic Cosmos database. Hospitalized patients in the ED with ICD-10-coded or laboratory-confirmed influenza A/B were included. Patients with an allergy to an antiviral were excluded. The primary outcome was the proportion of adult, hospitalized patients in the ED receiving oseltamivir, peramivir, baloxavir, or zanamivir. Associations were reported using univariate odds ratio with 95% confidence intervals (CI).

RESULTS: Of the 394,368 hospitalized ED patients, 202,793 (51.4%) received an antiviral in the ED. Antiviral treatment ranged from 63.1% in 2016 to 32.6% in 2021, rebounding to 48.6% in 2024. Differences in patient demographics between those treated and not treated were observed across age, sex, ethnicity, race, and spoken language. The likelihood of treatment increased with age. Males were 1.20 (1.18-1.22) times more likely, and Hispanic or Latino patients were 0.85 times less likely (95% CI 0.83-0.87) than their counterparts to receive an antiviral. The rate of antiviral treatment was strongly correlated with the national rate of influenza positivity among hospitalized patients in the ED (Pearson correlation 0.88).

CONCLUSION: Although multiple guidelines recommend the prompt administration of an antiviral for hospitalized patients to reduce influenza-related complications, only half are treated in the ED. Given the time-sensitive nature of antiviral treatment and the rising onboarding and wait times in EDs across the U.S., our study highlights a critical gap that will likely grow over time unless mitigation strategies are urgently implemented.

Sierra Land, MA
Sierra Land (Rush), Rasa Ansari (Rush), Nia Savera (Rush), Darren Nin (Rush), John Tackett (Rush), Ami N Shah (Rush), Brian C Gulack (Rush)

WHO ACTUALLY GETS A NUSS? A NATIONAL ANALYSIS OF TIMING TO SURGERY AFTER DIAGNOSIS OF PECTUS EXCAVATUM

INTRODUCTION: Indications for the Nuss procedure, the most common surgical repair for Pectus Excavatum (PE), are unclear, leading to substantial variation in treatment. We performed the following study to identify factors associated with receipt and timing of the Nuss procedure among adolescents diagnosed with PE.

METHODS: We performed a retrospective cohort study of adolescents aged 13-20 years in the PearlDiver database (2010-2023) diagnosed with PE (ICD-9 754.81 or ICD-10 Q67.6). Nuss procedures were identified by CPT codes 21740, 21741, or 21743. Time to event analysis was performed using Cox modeling.

RESULTS: Among 32,307 adolescents diagnosed with PE, 2,743 (8.5%) underwent a Nuss procedure within five years of diagnosis. Compared to patients aged 13-14, the likelihood of undergoing surgery decreased significantly with increasing age: 15-16 years (adjusted hazard ratio [aHR] 0.91, 95% confidence interval [CI]: 0.83-0.99), 17-18 years (aHR 0.70, 95% CI: 0.62-0.80), and 19-20 years (aHR 0.52, 95% CI: 0.43-0.60). Male patients were more likely than females to undergo surgery (aHR 1.16, 95% CI: 1.04-1.30). Regional variation was also observed: patients in the Midwest were more likely to undergo Nuss repair compared to those in the West (aHR 1.21, 95% CI: 1.08-1.40), while patients in the South (aHR 0.75, 95% CI: 0.66-0.80) and Northeast (aHR 0.61, 95% CI: 0.53-0.70) were less likely. Insurance type was not significantly associated with timing or likelihood of surgery (aHR 1.02, 95% CI: 0.92-1.10).

CONCLUSION: Age, sex, and geographic region are significant predictors of timing to Nuss procedure in adolescents with PE. This may reflect differences in severity at presentation or variations in surgical decision making. The lack of variation by insurance type suggests that socioeconomic status is not driving inequity access to Nuss repair. Future research should focus on standardizing indications for the Nuss procedure.

Abstract/Poster #: 73
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Sung-Ki Lee, B.S.Ed
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EVALUATION OF PHYSICAL FUNCTION IN PATIENTS WITH MYOSITIS USING THE HEALTH ASSESSMENT QUESTIONNAIRE-II (HAQ-II)

INTRODUCTION: Idiopathic inflammatory myopathies (IIM) are autoimmune diseases characterized by chronic muscle inflammation leading to impaired physical function and strength. Despite the importance of functional assessment, only a few validated tools exist for this population. While the Health Assessment Questionnaire (HAQ) is a widely accepted measurement tool for various rheumatologic conditions, the length and complex scoring can make it difficult to administer in the clinic. The Health Assessment Questionnaire-II (HAQ-II) is a streamlined 10-item version of the HAQ and may provide an efficient instrument. In this study, we aimed to evaluate the measurement properties of HAQ-II in patients with IIM.

METHODS: Adults with IIM enrolled in Forward Databank (1999-2023) with available data on HAQ-II were included. Patients completed HAQ-II along with assessments of disease activity, pain, fatigue, quality of life (SF-36), and comorbidities. Internal consistency of HAQ-II was assessed using Cronbach's α. Floor and ceiling effects, discriminant and construct validity (based on a priori hypotheses), and responsiveness (via linear mixed models adjusted for age, sex, and obesity) were evaluated.

RESULTS: A total of 192 IIM patients (mean age 54.8 years; 79.3% female) were included. HAQ-II demonstrated high internal consistency ($\alpha = 0.93$) and had negligible floor or ceiling effects with 7.8% and 0% respectively. All a priori hypotheses for discriminant validity were supported by significant score differences across groups stratified by SF-36 physical function, pain, fatigue, and disease activity (all $p<0.0001$). Fifteen of 17 a priori hypotheses (88.2%) for construct validity were met. HAQ-II had a stronger than predicted correlation with patient global disease activity and a weaker than expected correlation to SF-36 Role limit due to physical health. Longitudinal changes in HAQ-II scores were significantly associated with changes in pain, fatigue, global disease activity, and SF-36 physical component scores (all $p<0.0001$).

CONCLUSION: HAQ-II demonstrated high internal consistency, no significant floor or ceiling effects, adequate validity, and responsiveness for assessing physical function in patients with IIM. Our findings support the application of HAQ-II in both clinical and research settings.

Abstract/Poster #: 74
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M3

Katie McMorrow, BS
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MATERNAL FACTORS AFFECT VISITATION IN THE NEONATAL INTENSIVE CARE UNIT

INTRODUCTION: Newborns hospitalized in the neonatal intensive care unit (NICU) undergo a critical time of development where maternal presence positively influences long-term infant health through interactions like skin-to-skin holding, mother's breast milk feeding, and introducing language. Despite the known benefits, little is known about the extent to which childcare needs, out-of-pocket expenses, and maternal health are barriers to maternal visitation. Our objective is to determine what factors play a role in maternal NICU visitation.

METHODS: Data were obtained as part of an ongoing prospective cohort study of 20 Rush NICU families with ≥1 other child between June to October 2025. Data included demographic and socioeconomic characteristics, childcare arrangements, and maternal NICU presence and were collected through self-report and NICU visitor logs. Descriptive and bivariate analyses were used to examine associations of maternal health and household factors with maternal NICU visitation, categorized as at/above or below the median weekly visit days. Fisher's exact and Mann-Whitney tests were used for comparisons.

RESULTS: Of the 20 mothers enrolled, the median number of NICU visitation days per week was 3.0 (IQR 2.0-3.6). There was no difference in health insurance type (Medicaid vs private), mode of delivery (cesarean vs vaginal), or percent of mothers who reported they had enough childcare to be in the NICU when they desired (p=1.0 for all). Having only one other child (versus >1 other child) was more common in the at/above average visitation group (64%) compared to the below average group (11%) (p=0.056). All mothers in the at/above average group had an involved partner at home, compared to 78% in the below average group (p=0.19).

CONCLUSION: In this preliminary analysis, we found that maternal insurance and delivery mode were not associated with NICU visitation, but having only one other child (compared to >1) and an involved partner at home were correlated with more frequent maternal visitation. However, similar proportions of mothers in the two groups reported having enough childcare to be in the NICU when they desired. Future analysis should examine the demands of managing multiple other children versus the need for childcare itself as barriers to NICU visitation.

Abstract/Poster #: 75
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M3

Asher Miller, BS
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PROMOTIONAL CORONARY CALCIUM SCREENING DETECTS HIGH-RISK PATIENTS OUTSIDE TRADITIONAL REFERRAL PATHWAYS IN AN URBAN COHORT

INTRODUCTION: Coronary artery calcium (CAC) scoring is a key tool for risk stratification in preventive cardiology. While clinician-referred patients are typically higher-risk, some institutions have adopted low-cost promotional CAC screening to enable risk assessment in individuals not reached by traditional referrals. Among a diverse, urban cohort, do comorbidities, baseline preventive therapy, and CAC scores differ between patients undergoing clinician-referred vs. promotional CAC screening?

METHODS: A retrospective cohort study was conducted at a large urban academic center in Chicago. Adults undergoing CAC screening from Jan 2022 to Dec 2023 via clinician referral or low-cost promotion were included. The primary exposure was referral pathway. The primary outcome was CAC burden, categorized by Agatston score (0 = none, 1-99 = mild, 100-299 = moderate, ≥300 = severe) and stratified by coronary artery territory (Left Main, LAD, LCX, RCA). Baseline comorbidities and use of preventive medications were recorded. Descriptive statistics compared baseline characteristics. CAC coronary distributions were assessed using chi-square tests.

RESULTS: Of 1,743 patients screened, 932 via clinical referral and 811 were through promotion. Compared to referral patients, promotion patients had lower rates of hypertension (26.1% vs. 38.4%, $p<0.001$), dyslipidemia (15.9% vs. 24.7%, $p<0.001$), and CAD (6.3% vs. 11.4%, $p<0.001$). The use of preventative medications were lower in the promotion group: any statin (41.3% vs. 51.1%, $p<0.001$), high-intensity statins (14.9% vs. 24.4%, $p<0.001$), moderate-intensity statins (33.7% vs. 39.8%, $p=0.008$), aspirin (29.7% vs. 38.0%, $p<0.001$), and ezetimibe (2.0% vs. 4.6%, $p=0.002$). Referral patients had higher rates of Left Main (17.5% vs. 10.8%, $p<0.001$) and LCX (25.6% vs. 23.5%, $p=0.044$) CAC burden. LAD (42.2% vs. 46.9%, $p=0.113$) and RCA (27% vs. 28.6%, $p=0.433$) CAC burdens did not differ significantly between promotion and referral groups moderate/severe total CAC prevalence was similar between the promotion and referral cohorts (22.4% vs. 25.7%, $p=0.098$).

CONCLUSION:Promotion patients showed a high prevalence of non-zero CAC and similar moderate/severe CAC burden as referred patients, despite fewer comorbidities and lower medication use. These findings support low-cost promotional CAC screening as a practical method for detecting subclinical atherosclerosis and may enhance early risk detection in asymptomatic patients not typically reached by clinician referral.

Abstract/Poster #: 76
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Aamina Naveed, BS
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PATIENT-ONCOLOGIST PROGNOSTIC DISCORDANCE IN ADVANCED GYNECOLOGIC CANCERS: PREVALENCE AND PATIENT FACTORS

INTRODUCTION : In advanced cancer, clear communication is essential for effective shared decision-making, as an accurate understanding of prognosis guides end-of-life care. Patients who are well informed about their likely outcomes may make different decisions than those who are less informed. This study aimed to describe patient-oncologist prognostic discordance and identify associated patient factors.

METHODS: A prospective cohort study was conducted at a single-site urban academic medical center among patients with advanced gynecologic malignancies. The study evaluated associations between patient-oncologist prognostic discordance and patient factors, including information preferences, treatment goals, and demographics. Patients and oncologists completed the Prognosis and Treatment Perception Questionnaire (PTPQ) and validated items assessing anticipated two-year survival on a categorical scale (100%, 90%, etc.). Prognostic discordance was defined as a difference greater than ±1 level between patient and oncologist estimates. Exact concordance assessed whether patients' perceptions of their oncologists' expectations aligned precisely with oncologists' actual estimates. Descriptive statistics and Fisher's exact tests were performed.

RESULTS: Forty-six patients were enrolled (median age 61 [35-81]; 37% non-white) along with their five gynecologic oncologists. Sixty percent had recurrent disease and thirty percent had stage IV cancer. Ovarian cancer was the most common diagnosis (43%), followed by uterine cancer (30%). Overall, 40% of patient-oncologist dyads demonstrated prognostic discordance, with 77% of cases reflecting more optimistic patient estimates. Most patients (83%) preferred to receive as much diagnostic and treatment information as possible. Information preferences did not vary by treatment goals (p=0.14), race/ethnicity (p=0.5901), or education (p=0.718). Although most rated prognostic information as highly important, this was not associated with prognostic discordance (p=0.856). Education (p=0.451) and race/ethnicity (p=0.3216) were not associated with prognostic discordance. Exact concordance differed significantly by race (p=0.0165), with non-white patients more likely to exhibit optimistic discordance (p=0.0298).

CONCLUSION: Our cohort demonstrated high rates of prognostic discordance between patients and oncologists. Information preferences, perceived importance of prognosis, and education were not associated with discordance. Race emerged as a significant factor, with non-white patients demonstrating significantly greater optimistic discordance. These findings highlight the need for more equitable and tailored approaches to prognostic communication in advanced gynecologic cancer care.

Abstract/Poster #: 77
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Michael Nguyen, BA
Michael Nguyen - RMC Rachel Akers - RMC Anatoli Karas - RUMC Department of Otolaryngology

BIRTH METHOD AND SHORT TERM OUTCOMES IN NEONATAL ENT SURGERY: A NSQIP PEDIATRIC STUDY

INTRODUCTION: Mode of delivery (cesarean vs vaginal birth) has been associated with early differences in neonatal physiology, respiratory transition, and microbiome development. Whether birth method independently influences perioperative outcomes among neonates undergoing otolaryngologic surgery remains unclear. This study evaluated the association between birth method and 30-day postoperative morbidity in neonates undergoing ENT procedures.

METHODS: We performed a retrospective cohort study using the ACS NSQIP-Pediatric database (2012-2022). Neonates (<30 days old) undergoing otolaryngologic surgery were included and stratified by delivery mode. The primary outcome was a composite of serious 30-day morbidity or mortality. Bivariate comparisons were performed using chi-square/Fisher tests for categorical variables and Wilcoxon tests for continuous variables. Multivariable logistic regression assessed the independent association between birth method and the primary outcome, adjusting for ASA class, preoperative ventilator dependence, procedure type (tracheostomy vs other), and age at surgery. Mediation analyses evaluated postoperative pneumonia and sepsis as mediators. Sensitivity analyses restricted the cohort to contemporary NSQIP years (2020-2022) and excluded infants with major congenital anomalies.

RESULTS: A total of 833 neonates underwent ENT surgery (46% cesarean, 54% vaginal). Cesarean-delivered infants had higher preoperative acuity, including greater rates of ASA IV classification (39% vs 25%) and ventilator dependence (53% vs 40%) (both $p < 0.001$). Unadjusted composite morbidity was higher in the cesarean group (19% vs 13%), but after adjustment birth method was not associated with increased odds of serious morbidity (aOR ≈ 1.20, 95% CI crossing 1, p = ns). Birth method was not associated with pneumonia, sepsis, reintubation, or readmission. Mediation analysis showed no indirect effect through postoperative infection. Sensitivity analyses yielded consistent null findings.

CONCLUSION: Although cesarean-delivered neonates exhibited greater baseline illness severity, birth method was not an independent predictor of postoperative morbidity among neonates undergoing otolaryngologic surgery. Perioperative risk is driven primarily by underlying clinical status rather than delivery mode. These findings support focusing on neonatal physiological optimization rather than birth history when assessing surgical risk.

Nhat Nguyen, Bachelor of Biology
Nhat Nguyen (RMC); Matthew Alfarano (RUMC); Amy Marks (RUMC); Daven Patel (RUMC); Evelyn Schraft (RUMC); Tina Sundaram (RUMC); Aylin Ornelas Loredo (RUMC); Ohm Shukla (RMC); Gary D. Peksa (RUMC); Michael Gottlieb (RUMC).

ARE TWO PLANES BETTER THAN ONE?: A COMPARATIVE ANALYSIS OF TRANSVERSE VERSUS SAGITTAL SUPRAPUBIC VIEWS IN THE FAST EXAMINATIONS

INTRODUCTION: Point-of-care ultrasound (POCUS) is increasingly used in the ED for rapid bedside assessment and clinical decision-making. Among POCUS examinations, Focused Assessment with Sonography in Trauma (FAST) and extended FAST (eFAST) are essential for evaluating free fluid in trauma, suspected ruptured ectopic pregnancy, and performing paracentesis for ascites. While eFAST is highly specific for detecting intra-abdominal free fluid, its sensitivity remains limited. Variation exists in the approach to imaging the suprapubic window, particularly regarding the use for a single plane versus both sagittal and transverse plane. Limited studies have directly compared these views to guide clinical practice and standardize research protocols. Our study aimed to assess the diagnostic value of using both sagittal and transverse suprapubic views during a FAST/eFAST examination.

METHOD: We conducted a retrospective chart review analyzing suprapubic windows of FAST/eFAST images performed 08/15/2017-08/01/2024. Exclusion criteria included absence of a suprapubic view, availability of only one imaging plane, incorrect exam type, duplicate studies from the same patient within one hour, and non-interpretable suprapubic images. Four ultrasound fellowships clinicians independently evaluated each image (sagittal or transverse) for free fluid, image quality, and diagnostic confidence. Reviewers were blinded to clinical information and did not evaluate more than one imaging plane from the same patient. The study was deemed exempt by the Institutional Review Board.

RESULTS: Of 958 FAST/eFAST studies identified, 497 met inclusion criteria. Among these, 433 (87.1%) were diagnostic and 64 (12.9%) were non-diagnostic. Of diagnostic images, 93 (21.5%) sagittal views and 74 (17.1%) transverse views were positive for free fluid. 32 exams (34.3%) were positive only on the sagittal views but were negative on the transverse view, whereas 13 cases (17.6%) were positive on the transverse view but negative on the sagittal view. Using both views reduced non-diagnostic rates from 12.8% to 1.2%. Image quality was slightly higher in the sagittal plane, while diagnostic confidence was slightly higher in the transverse plane

CONCLUSION: Incorporating both sagittal and transverse for the suprapubic views during FAST/eFAST examinations can reduce the non-diagnostic rates and improves detection of free fluid. Differences in diagnostic performance, image quality, and confidence support a multi-view approach.

Kristina Olsen, BA in Biology, MA in Bioethics
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SMART BP: SELF-MONITORING AND RESOURCE TRAINING FOR BLOOD PRESSURE MANAGEMENT

INTRODUCTION: According to the Chicago Health Atlas, hypertension rates vary greatly in Chicago and range from 16.5% to 51.4% across neighborhoods. Having high blood pressure (BP) puts individuals at risk for chronic health conditions, especially in patients with low Social Vulnerability Index (SVI) scores. Our overall aim is to increase ambulatory BP adherence and empower patients to control their Stage 2 Hypertension.

METHODS: Patients at three RUSH family medicine clinics with a BP over 140/90 and an SVI score over 0.6 were contacted at either in-person clinic visits or via telephone. Those who agreed to be part of the program were seen in clinic and given a "how to" training and an ambulatory cuff to bring home. Patients were then called weekly to collect at home BP readings.

RESULTS: Prior to June 2025, we identified 305 patients at three RUSH family medicine clinics meeting our criteria using the CAPriCORN Common Data Model. From June through October 2025, we attempted to recruit 86 of these patients as they came into the clinic or via telephone. 11 patients began the program (13%) and 1 patient completed the program (1.2%). While initial receptivity to the SMART BP program seemed positive based on survey results (5 of 7 surveyed participants indicated that they believed a BP cuff would help them lower their blood pressure), retention in the program was hindered by a lack of follow-up when participants were subsequently called. The patient who completed the program was able to lower her BP over the course of 8 weeks to be under 140/90.

CONCLUSION: While recruiting enough patients in the clinics was limited based on students' schedules and time constraints, recruiting via telephone was similarly unsuccessful as many people did not pick up even after three attempts on different occasions. In the future, we plan to implement other evidence-based engagement methods such as an opt-out program (as opposed to our current opt-in model). We will switch from requiring in-person pick-up of BP cuffs to a system of mailing BP cuffs to enrollees to offset potential transportation barriers hindering recruitment.

Abstract/Poster #: 80
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: Clinical Resident

Ami Patel, BS, MD
Ami Patel, MD, Rush University

DO GOOD, FEEL GOOD? INVESTIGATING THE LINK BETWEEN HELPING OTHERS AND MENTAL WELL-BEING.

INTRODUCTION: Previous research suggests a positive association between prosocial virtues and mental health (Snyder & Lopez, 2002); however, the influence of religion on this relationship is unclear, potentially confounding the correlation. This study aims to investigate the link between prosocial behavior and mental health, considering the potential mediating role of religious involvement.

METHODS: We utilized cross-sectional data from the Global Flourishing Study with 200,000 participants from nationally representative samples. The study examined the relationship between prosocial behavior (e.g., donating, helping strangers, volunteering, and promoting general good) and mental health outcomes (depression symptoms, anxiety symptoms, and self-rated mental health) using logistic regression models, controlling for demographic variables and religious involvement. Analyses were conducted globally and on the American subset.

RESULTS: Logistic regression analyses showed significant associations between prosocial behavior and self-reported mental health outcomes, with few exceptions. Notably, individuals who frequently engaged in good deeds (OR 1.060, 95% CI 1.048-1.072) and promoted the general good (OR 5.853, 95% CI 5.712-5.998) were significantly more likely to report better self-rated mental health.

CONCLUSION: Our findings highlight a significant correlation between prosocial behavior and mental health outcomes, including reduced depression and anxiety symptoms and improved self-rated mental health. These results align with prior research that identifies positive associations between prosocial activities and mental well-being. Further longitudinal research is needed to explore the directionality of this relationship, using data from the next wave of the Global Flourishing Study.

REFERENCE: Snyder, M., & Lopez, S. (Eds.). (2002). Handbook of positive psychology (2nd ed.). Oxford University Press.

Abstract/Poster #: 81
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: Clinical Resident

Ashley Roberts, MD
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EVALUATING THE NECESSITY AND POTENTIAL HARM OF LABORATORY TESTING IN COLORECTAL SURGERY PATIENTS

INTRODUCTION: Overtreatment and low-value care, including unnecessary lab testing, contributes an estimated $75.7-$101.2 billion in annual U.S. healthcare spending. Laboratory testing is routine in perioperative care, yet the clinical necessity is often unclear. Excessive testing increases costs, generates environmental waste, and exposes patients to potential harms such as iatrogenic anemia and increased transfusion requirements. Because postopeative laboratory testing is commonly incorporated into colorectal surgery (CRS) care pathways, evaluating test utilization offers an opportunity to lower costs, minimize environmental impact, and reduce preventable patient harm.

METHODS: The five most common CRS procedures at RUMC over the past three years were identified: right hemicolectomy/ileocecectomy (RH/I), left hemicolectomy/sigmoidectomy (LH/S), low anterior resection (LAR), ileostomy reversal (IR), and colostomy takedown/reversal (CT/R). Scheduled cases were included; urgent/emergent cases, combined cases, and patients who were not CRS primary throughout admission were excluded. A retrospective chart review captured laboratory tests obtained by hospital day, complications documented in discharge summaries (defined as events potentially prompting lab orders), and 30-day readmissions. Primary labs analyzed were complete blood count (CBC)/CBC with differential, basic metabolic panel (BMP), complete metabolic panel (CMP), magnesium, and phosphorus. Costs were obtained from the revenue cycle team. Unnecessary tests were defined as labs ordered for patients without recorded complications.

RESULTS: A total of 394 patients met inclusion criteria: 126 LH/S, 104 RH/I, 60 LAR, 39 CT/R, and 65 IR. Mean age was 58.9±15.3 with mean ASA 2.56. Across the cohort, 1929 CBCs, 1707 BMPs, 180 CMPs, 1760 magnesium, and 1764 phosphorus tests were obtained, totaling $665,001 in costs (excluding 1,231 miscellaneous labs). Complications occurred in 114 patients (28.9%), meaning 284 patients (72.1%) underwent unnecessary testing. Patients with unnecessary labs were younger with shorter lengths of stay, without significant differences in sex or ASA. Using LH/S as baseline, LAR patients had lower odds of unnecessary tests.

CONCLUSION: Most CRS patients receive daily laboratory testing without clinical indication. Assuming unnecessary testing was evenly distributed across patients, an estimated $479,466 in tests may have been unnecessary. Identifying patterns associated with low-value testing can inform future guidelines that reduce unnecessary labs, enhance patient safety, lower costs, and decrease environmental impact.

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EVALUATING VENLAFAXINE AS FIRST-LINE TREATMENT FOR ANXIETY IN BREAST CANCER PATIENTS: A RETROSPECTIVE ANALYSIS

INTRODUCTION: Venlafaxine, a selective serotonin and norepinephrine reuptake inhibitor, can be used for the treatment of anxiety disorders, depressive disorders, and vasomotor symptoms in patients with breast cancer. For breast cancer patients on tamoxifen, venlafaxine is the first choice for psychiatric treatment because it does not inhibit CYP450 2D6, which converts tamoxifen to the active metabolite. Clinically, we observe high response rates to venlafaxine for anxiety, depression, and vasomotor symptoms. Our study aims to investigate if venlafaxine should be considered the first line treatment for anxiety in all patients with breast cancer, independent of their hormone therapy status.

METHODS: We will perform a retrospective chart review of patients with breast cancer and anxiety in our psychiatry registry. Patients will be separated into two cohorts: venlafaxine vs other anti-anxiety medication. Baseline severity will be rated using CGI-S. 3-month clinical improvement will be measured by change in CGI-I. If enough psychometric data is available, we will also use GAD-7 initial and 3-month scores as secondary outcomes. Data analysis will be calculated using R. Univariate linear regression will be used to determine if venlafaxine is associated with greater improvement compared to other anti-anxiety medications.

RESULTS: Baseline demographic data and symptom severity will be reported as above. Outcome data will be reported as above using a modified CGI-S and CGI-I. We will perform a secondary analysis if sufficient data is present with GAD-7 scores to determine if venlafaxine reduced anxiety.

CONCLUSION: We will provide insight into the first line treatment of anxiety. We will determine if venlafaxine should be the preferred anti-anxiety medication because of the potential impact on psychiatric and vasomotor symptoms, in addition to the safety profile for the subtype of breast cancer patients on tamoxifen.

Abstract/Poster #: 83
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Sara Salomon, BA
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TIMING OF COMPASSIONATE EXTUBATIONS: 'DAY SHIFT' VS 'NIGHT SHIFT'

INTRODUCTION: Palliative ventilator withdrawal (PVW) is a common ICU procedure.1-3 It involves the intentional removal of ventilatory support to allow the natural course of death in patients with terminal illness when the burden of treatment outweighs its benefit.4 Little is known about best practices for PVWs, including when they most often occur. One cohort study found that 20% of all ICU extubations (compassionate and standard) occur overnight.5 We aimed to assess the distribution of compassionate extubations (CEs) between the 'Day Shift' and 'Night Shift,' hypothesizing that more CEs occur during the day.

METHODS: This retrospective, cross-sectional study evaluated adult patients who received PVWs in ICUs at Rush University Medical Center from January 2017 to December 2021. Using the EPIC electronic medical record, we identified patients >18 years old who were admitted to the ICU with a physician order for PVW. Exclusion criteria were standard (non-palliative) extubations, accidental or self-extubations, tracheostomy, death while still mechanically ventilated, and pregnancy. Patients were categorized by CE time into 'Day Shift' (07:00-18:59) or 'Night Shift' (19:00-06:59) for comparison.

RESULTS: Of 837 compassionate extubations performed over the study period, 615 (73.5%) were performed during the day and 222 (26.5%) at night, which was statistically significant ($p<0.001$). There were no significant differences between the two groups in terms of age ($p=0.75$), gender ($p=0.93$), BMI ($p=0.72$), or admitting ICU. However, significant differences were found for race ($p=0.007$), hospital LOS ($p=0.01$), ICU LOS ($p<0.001$), MV duration ($p=0.002$), and time from CE to death ($p=0.026$). A higher proportion of patients extubated at night died in the ICU ($p=0.018$).

CONCLUSION: Our results show a statistically significant difference in distribution, with the majority of compassionate extubations (73.5%) occurring during the 'Day Shift' rather than the 'Night Shift.' Additional significant differences were found regarding race, LOS, MV duration, and time from CE to death; however, these may not be clinically significant. These findings should prompt further granular studies to better understand differences between CEs performed during the day and at night.

Abstract/Poster #: 84
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

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UNDERSTANDING BARRIERS TO EVIDENCE-BASED IMAGING PRACTICES FOR PEDIATRIC APPENDICITIS: A QUALITATIVE ANALYSIS OF EMERGENCY DEPARTMENT DECISION-MAKING

INTRODUCTION: Pediatric appendicitis is a common surgical emergency that requires timely and accurate diagnosis. National guidelines recommend ultrasound as the first-line imaging modality and MRI as a second-line option, since both avoid ionizing radiation. Despite these recommendations, many hospitals continue to use CT at disproportionately high rates. Factors such as operator-dependent ultrasound quality, limited MRI availability, workflow pressures in emergency departments, and variable provider familiarity with radiation risks may contribute to this practice pattern. Understanding physician perspectives on imaging selection is essential for improving adherence to evidence-based guidelines.

METHODS: We conducted a qualitative study using semi-structured interviews with twenty-two emergency medicine physicians from five Chicagoland hospitals. Both pediatric-trained and adult-trained providers were included. Interviews explored perceptions of diagnostic accuracy, workflow constraints, technician availability, training background, and awareness of radiation risks. All interviews were audio-recorded, transcribed, and coded using thematic analysis. Coding reliability was ensured through iterative codebook refinement and consensus discussion among the research team.

RESULTS: Four major themes emerged. (1) Resource and workflow constraints: Physicians described limited access to pediatric-trained sonographers, inconsistent MRI availability, and pressure to maintain throughput, all of which often favored CT. (2) Variability in technician and provider skill: Participants emphasized that ultrasound quality was highly operator-dependent, and many providers-particularly those without pediatric training-reported limited experience interpreting pediatric ultrasound. (3) Influence of training background: Many adult-trained emergency physicians defaulted to CT because it matched their residency training and offered perceived greater diagnostic certainty. (4) Institutional culture and knowledge gaps: Pediatric institutions were more likely to use standardized ultrasound-first pathways, whereas general hospitals demonstrated inconsistent awareness or adoption of updated imaging guidelines.

CONCLUSION: Barriers to ultrasound-first imaging occur at individual and institutional levels. Initiatives that strengthen sonographer training, enhance provider education on radiation risks and guideline-based imaging, and promote standardized clinical pathways may improve adherence to evidence-based practices and reduce unnecessary radiation exposure in children.

John Simpson, BS
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SEX AND RACIAL DISCORDANCE IN REFERRALS FOR CORONARY ARTERY CALCIUM SCREENING AT A LARGE URBAN CENTER

INTRODUCTION: Coronary artery calcium (CAC) scoring is a non-invasive method to detect subclinical atherosclerosis. In 2022, RUSH University Medical Center launched a low-cost CAC screening promotion to expand access and improve early cardiovascular risk detection. This study evaluated referral patterns within a racially diverse, urban population; an area not well characterized in prior literature.

METHODS: We performed a retrospective analysis of Chicago-based patients referred for CAC testing from January 2022 to December 2023. Patient and referring provider demographics (sex and race/ethnicity) were extracted from health records. Descriptive statistics summarized distributions. Associations between patient and provider sex and race/ethnicity were examined using contingency tables. Patient-provider sex concordance was evaluated with Chi-square testing (significance $p<0.05$).

RESULTS: A total of 931 patients completed CAC testing. Of these, 59.4% were female and 40.6% male. Race/ethnicity data were available for 380 patients; among these, 41.7% identified as non-White, including Black, Hispanic/Latino, Asian, and other racial/ethnic groups. Regarding referring clinicians, 53.3% were female and 46.7% male. Strong patient-provider sex concordance was observed. Among female patients, 69.1% were referred by female providers; among male patients, 69.8% were referred by male providers. Female providers referred predominantly female patients (77.0%), whereas male providers referred mostly male patients (60.7%). This association between patient and provider sex was significant ($X^2(1, N=931)=136.62$, $p<0.0001$). Patient race/ethnicity also differed by provider sex. Female providers referred a higher proportion of Black patients compared with male providers (27.7% vs. 13.5%), while male providers referred a higher proportion of White patients (64.8% vs. 52.8%). This distribution showed a significant association with provider sex ($X^2(4, N=898)=29.59$, $p<0.0001$).

CONCLUSION: Referral patterns for CAC screening varied significantly by both patient and provider demographics. Female providers were more likely to refer female and racially diverse patients, while male providers referred more male and White patients. These findings highlight potential provider-level influences on access to cardiovascular risk assessment and may inform strategies to promote equitable screening.

Abstract/Poster #: 86
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M3

Emily Sullivan, BA
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TIMING OF COMPLEMENTARY FOOD INTRODUCTION AND GROWTH OUTCOMES AT 8- AND 20-MONTHS CORRECTED AGE IN FORMER VERY PRETERM INFANTS

INTRODUCTION: Current infant feeding recommendations vary, with some advising exclusive mother's own milk for 6 months before introducing complementary foods (solid foods), while others recommend solids beginning at 4-6 months. Limited data suggest earlier timing of solid food indtroduction (TSFI) in former very preterm (VPT, gestational age (GA) <32 weeks) infants may support growth, but evidence is sparse. The goal of this study is to evaluate whether growth outcomes at 8- and 20-months corrected age (CA) in former VPT infants differ by TSFI.

METHODS: Infants born <32 weeks GA during Nov 2020-Oct 2024 were enrolled into a prospective neonatal intensive care unit (NICU) follow-up study. Mothers completed diet questionnaires every 2 weeks from NICU discharge through 4 months CA and monthly from 5-20 months CA. Infants were categorized by TSFI: <6 months CA vs. ≥6 months CA. Weight, length, and head circumference (HC) were measured at 8- and 20-month CA visits and converted to z-scores, adjusted for sex and CA. Subjects were included in this analysis if they had complete TSFI data and anthropometric data at either 8- or 20-month CA. Independent sample t-test was used to assess whether weight, length, and HC standardized measurements (z-scores) differed across the two TSFI groups.

RESULTS: Of the 73 former VPT infants, 28 (38%) had TSFI <6 months CA. At 20 months CA, infants with TSFI <6-month CA had significantly higher weight z-scores (0.347) and length z-scores (0.515) compared with TSFI ≥6 months CA (weight: -0.621; length: -0.126). HC z-scores did not differ significantly between groups. At 8-month CA, no significant differences between TSFI groups in z-scores were noted.

CONCLUSION: Mean standardized weight and length measures at 20-month CA differed significantly by TSFI in former VPT infants. These findings constitute limited evidence on modest growth benefits of earlier complementary feeding and warrant further evaluation of the relationship of TSFI with long-term growth and adiposity. These future studies would benefit from incorporating larger samples and analytical strategies that aim to address potential sources of confounding.

Abstract/Poster #: 87
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

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THE HEALTHY DEDICATED AFRICAN AMERICAN DAD STUDY: ASSESSING FUNCTIONAL CONSEQUENCES OF GUT DYSBIOSIS IN AFRICAN AMERICAN NON-RESIDENT FATHERS

INTRODUCTION: The gut microbiome, consisting of bacteria and other microorganisms that colonize the gastrointestinal tract, plays an important role in overall human health. The bacterial composition of the gut microbiome is highly responsive to environmental and psychological stress, which may be particularly heightened for African American (AA) fathers when they do not live in the household with their children. Familial separation coupled with the onslaught of negative perceptions, stereotyping, racism and socioeconomic disadvantage can undermine mental and physical health outcomes. Even so, less is known about the physical health outcomes associated with non-resident fatherhood. We previously compared the stool of African American non-resident (AANR) fathers to age- and BMI-matched AA resident men and found that fathers' non-residence differentially affects the gut microbiome. In this study, we aimed to determine the functional consequences of the disrupted microbial community composition.

METHODS: This prospective, cross-sectional, observational study assessed stool samples collected from 18 AANR fathers (aged 28-62, mean 40) and 22 AA resident men (aged 21-63, mean 43) as population controls. All participants lived in the Chicagoland area and were recruited from the NIH-funded Dedicated African American Dad (DAAD) study conducted from 2014-2019 (study ID #5R01NR011182-06). Samples were self-collected at home using the DNA Genotek OMNIgut kit. Stool microbial communities were characterized using 16S rRNA gene amplicon sequencing and PICRUSt2 (Phylogenetic Investigation of Communities by Reconstruction of Unobserved States) was utilized to infer metagenomic functional pathways from this 16S rRNA data.

RESULTS: Stool microbiota profiles showed gut dysbiosis, with reduced relative abundance of beneficial microbes and increased putative pathogenic taxa in AANR fathers. PICRUSt2 data inferred that, compared to controls, AANR fathers exhibited enriched biosynthetic pathways for components of RNA, DNA, proteins, and fatty acids, and bacterial cell walls, as well as metabolic activity including nitrate reduction, glycolysis, breakdown of fructose and inositol, and most notably, fermentation.

CONCLUSION: These stool microbiota results demonstrate evidence of gut dysbiosis, with potential functional adaptations, in our cohort of AANR fathers. This altered microbiome profile may reflect chronic psychosocial stress experienced by this population.

Abstract/Poster #: 88
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Emma Theisen, BS
Emma Theisen (Rush), Corinthia Gonzales (Rush), Alexandra Sarau (Rush), Joohye Kim (Rush), Daniel Landek (Rush), Manvita Tatavarthy (Rush), Antonio Bianco (Rush), Annabelle S. Volgman(Rush)

RESIDUAL SYMPTOMS AND QUALITY OF LIFE IN TREATED HYPOTHYROID PATIENTS WITH CARDIOVASCULAR DISEASE

INTRODUCTION: Many patients with hypothyroidism report persistent symptoms despite stable thyroid hormone therapy and normalized thyroid-stimulating hormone (TSH). This study aims to evaluate the relationship between serum TSH and health-related quality of life (QoL).

METHODS: We conducted a prospective observational cohort study at the Rush Heart Center for Women including females (≥18 years) with overt hypothyroidism on stable levothyroxine (LT4) therapy (≥75 mcg/day for ≥6 months) and TSH values within the institutional reference range (0.35-4.94 µIU/mL). Patients completed the ThyPRO-39 survey at enrollment, and concurrent TSH was measured. TSH values were categorized into quartiles (0.35-1.00, 1.01-2.00, 2.01-3.00, 3.01-4.94 µIU/mL). The primary outcome was the correlation between TSH quartile and ThyPRO-39 score, adjusted for age, sex, menopausal status, LT4 dosage, anemia, vitamin deficiencies, major depressive disorder (MDD), hypertension, and Charlson Comorbidity Index (CCI). Higher scores suggest worse QoL. Secondary outcomes included the association between TSH and LDL cholesterol, adjusted for statin therapy.

RESULTS: For a total of 76 female patients, the third TSH quartile was significantly associated with higher ThyPRO-39 scores compared with Q1 (β= 10.89, SE = 4.12, p = 0.010). Quartiles Q2 and Q4 showed trends toward higher scores (β = 6.31, p = 0.095; β = 10.99, p = 0.086), though fewer patients were observed in Q4 which may limit association. MDD and hypertension were strongly associated with higher ThyPRO-39 scores (β = 16.04, SE = 3.53, p < 0.001; β = 7.75, SE = 3.62, p = 0.0362). The model explained 34% of the variance in ThyPRO-39 scores (adjusted R^2= 0.227).

CONCLUSION: In euthyroid patients on LT4, TSH within the 2.01-3.00 uIU/mL range may be associated with modestly worse thyroid-related QoL. MDD and hypertension appear to be strong, independent correlates of thyroid-related QoL. Due to fewer patients in Q4, we cannot exclude the possibility that higher TSH values may also impact QoL. These findings suggest that factors beyond TSH normalization may influence QoL, highlighting the potential for individualized management in patients with these comorbidities.

Abstract/Poster #: 89
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Nathan Vance, BSPH
Nathan Vance, BSPH (Department of Ophthalmology, Rush University); Catherine Chang, BA (Department of Ophthalmology, Rush University); Matthew MacCumber, MD, PhD (Department of Ophthalmology, Rush University)

IMMUNOMODULATORY DRUGS AND PROLIFERATIVE VITREORETINOPATHY IN A LARGE CLINICAL DATABASE

PURPOSE: Assess whether systemic immunomodulatory drugs taken at baseline modulate risk of developing proliferative vitreoretinopathy (PVR) following rhegmatogenous retinal detachment (RRD).

METHODS: A retrospective cohort study will be conducted using the Vestrum Health database (Corevitas, LLC) to analyze patients who were diagnosed with RRD over a seven-year time period, extending from January 2015 to February 2023 across 67 private practices. Only patients with a confirmed diagnosis of PVR within 180 days of a confirmed diagnosis of RRD were included to exclude cases involving epiretinal membrane or other conditions that could potentially confound our results. Potential risk factors including baseline medications were included within the multivariate model during the time of analysis.

RESULTS: In multivariate analysis, none of the classes of drugs assessed were independently associated with a difference in the risk associated with developing PVR post RRD. In univariate analysis, Prednisone was found to be associated with an increased risk of developing PVR post-vitreoretinopathy, independent from the "steroid" grouping (OR: 1.40, 95% CI = [1.13, 1.74]), though this finding was not significant in multivariate analysis.

CONCLUSIONS: None of the drugs assessed modulated risk associated with the development of PVR post RRD. Patients taking Prednisone at baseline were found to have an increased risk of developing PVR post RRD in univariate analysis, though this finding was likely driven by underlying inflammatory disease. Further studies in patients without underlying inflammatory disease are necessary to determine whether underlying inflammatory conditions offset the benefits provided by immunomodulatory drugs.

Abstract/Poster #: 90
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Emily Weiser, BS
Sam Wein, MFA; Rush University Medical Center Tricia Johnson, PhD; Rush University Aloka L. Patel, MD; Rush University Medical Center Leslie M. Harris, MD, MHS; Rush University Medical Center

MATERNAL PREFERENCES FOR SIBLING PRESENCE IN THE NEONATAL INTENSIVE CARE UNIT

INTRODUCTION: Many studies demonstrate strong benefits of family involvement in the Neonatal Intensive Care Unit (NICU), but more work is needed to understand barriers that limit family time in the NICU and identify solutions to meet families' needs. One major barrier is balancing childcare for other children.

METHODS: Semi-structured 30-60 minute interviews focused on childcare needs and decision-making were conducted by two non-clinical research assistants at RUMC NICU as part of an ongoing Rush IRB approved pilot prospective cohort study. Eligible participants had an infant in the NICU and at least one other child ≤13 years. RUMC NICU policy specifies only children ≥12 years can visit. Interview transcripts were preliminarily analyzed for responses indicating preference and reasoning for sibling presence in the NICU.

RESULTS: 18 mothers of NICU-hospitalized infants participated in in-person or virtual interviews. 12 participants (67%) reported a desire to have their other children in the NICU with 5 of the 12 mothers (42%) citing family bonding, through activities like talking, reading and feeding, as primary motivation for including siblings; 7 did not share a specific reason. 6 participants (33%) expressed a preference against sibling presence in the NICU with 5 out of 6 of those parents (83%) concerned for exposure to germs and 2 (33%) for risk of emotional distress for siblings. 7 participants (58%) endorsed the idea of a childcare option within the NICU; 3 out of 7 suggested the idea themselves, while 4 out of 7 were explicitly asked as a follow-up to various questions regarding NICU experience, including 1 participant who preferred siblings not be present due to germ risk.

CONCLUSION: While most mothers desired sibling presence in the NICU, some did not due to risks of infection and emotional distress of siblings. The unanimous support of those asked for a childcare option within the NICU, even among a parent concerned with infection, warrants further investigation into the logistical and emotional impacts of a NICU-based sibling care program. Future interviews within this study will include an explicit question about having an option for childcare in the NICU to further explore parents' preferences.

Abstract/Poster #: 91
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: RMC: M2

Allison Wuller, BS
Allison Wuller BS (Rush), Veena Raiji MPH, MD (Rush)

COMPARATIVE OUTCOMES BETWEEN LOCAL STEROID THERAPIES IN NON-INFECTIOUS UVEITIS

INTRODUCTION: Corticosteroids are the mainstay of treatment for non-infectious posterior uveitis and panuveitis. Local steroid treatment, while usually preferred over oral treatment due to systemic effects, are associated with intraocular pressure (IOP) elevation and cataract progression. The purpose of this study is to compare treatment outcomes across dexamethasone intravitreal implant (DEX), fluocinolone acetonide implant (FAc), and suprachoroidal triamcinolone acetonide (SCS-TA).

METHODS:A retrospective analysis was conducted using the Vestrum Database, a de-identified patient database. Patients with non-infectious intermediate, posterior, and panuveitis treated with DEX, FAc, or SCS-TA between January 2015 and June 2025 were included. Outcomes included IOP, best corrected visual acuity (BCVA), and central retinal thickness (CRT). Data were analyzed at baseline, 90 days, 180 days, and 365 days after the index treatment.

RESULTS: A total of 1,638 eyes met inclusion criteria: 1,510 treated with DEX, 79 with FAc, and 49 with SCS-TA. Overall, 619 (37%) were male and 1,045 (63%) were female. The average number of implants for DEX patients was 4.3, and the mean age was 64.1 years (SD = 15). BCVA data were converted from Snellen to ETDRS letters. Mean BCVA improved in all groups at 365 days: 58.8 to 62.9 for DEX, 67.3 to 70 for FAc, and 55.3 to 57.4 for SCS-TA. CRT decreased in all groups by 365 days: 446.5 to 348.9 for DEX, 344.7 to 283.2 for FAc, and 415.1 to 384.1 for SCS-TA. Average IOP increased in all groups. For DEX, IOP rose by 0.5 at 90 days but showed a 0.1 overall increase by 365 days. FAc showed a 0.4 rise at 90 days and a 0.7 increase by 365 days. SCS-TA demonstrated a 1.8 increase at 90 days but a 0.3 average increase at 365 days.

CONCLUSION: Changes in visual acuity were similar across the three steroids but have not yet been determined to be statistically significant. All treatments showed decreases in CRT, with DEX demonstrating a larger reduction. IOP increased at 90 days for all groups, but only FAc continued to rise by 365 days. Interpretation should consider the smaller sample sizes of the FAc and SCS-TA groups.

Abstract/Poster #: 92
Session: Poster Presentation
Theme: Clinical Practice II: Cohort Studies
Trainee Rank: CON: MS

Sean Zilligen, BS
Nicole Valenzuela, Sean Zilligen, Dr. Sarah Ailey

IMPROVING EMERGENCY DEPARTMENT SEPSIS COMPLIANCE AT RUSH OAK PARK HOSPITAL

INTRODUCTION: Sepsis is the third leading cause of mortality in the United States (Desposito & Bascara, 2024). Methods for detecting sepsis vary across hospitals. At Rush Oak Park Hospital (ROPH), the Systemic Inflammatory Response Syndrome (SIRS) criteria are used to identify septic patients. Health care providers are alerted via an electronic prompt that triggers a sepsis best practice alert (BPA). Once sepsis is identified, care follows a structured journey per policy, outlining timing for fluid resuscitation, lactate draws, blood cultures, and antibiotic administration. Current audits indicate that compliance with all elements of the sepsis journey is lowest in the emergency department (ED). PURPOSE: The goal of this project is to improve compliance with the sepsis journey in patients aged 18 years and older, to enhance overall sepsis outcomes.

METHODS: Compliance trends and areas of non-adherence will be evaluated through Excel-based review of sepsis journey data. A systemwide mock tracer is scheduled across Rush Oak Park Hospital (ROPH), Rush Copley Hospital, and Rush University Medical Center to assess protocol alignment and identify gaps in practice. At ROPH, Emergency Department staff will be interviewed to identify workflow barriers contributing to reduced compliance. The project team has met with the Unit Advisory Committee and the Head of Sepsis at ROPH to refine priorities and understand unit-level challenges. Findings and proposed interventions will be presented to the Magnet Committee and Sepsis Committee for collaborative planning and implementation.

RESULTS: Data analysis and interventions are ongoing. It is anticipated that improving compliance with the sepsis journey will enhance sepsis-related outcomes and overall hospital sepsis ratings.

CONCLUSION: Enhancing compliance with sepsis protocols has the potential to improve patient outcomes and hospital performance metrics. Understanding barriers and implementing targeted interventions may also inform strategies for optimizing sepsis detection and management in patients with complex physical or mental health needs. Data from this study will be utilized for End Diagnostic Overshadowing: Addressing Ableism in the Healthcare Context, an NIH-funded research study.

Abstract/Poster #: 93
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: RMC: M1

Catherine Bates, BS
Naisargi Modi (Cook County), Manuel Carpio Tumba (Pitt), Raisa C Silva (HMS), Diana Louden (UW), Didem Saygin (RMC)

THE EVOLVING LANDSCAPE OF OUTCOME MEASURES IN MYOSITIS CLINICAL TRIALS: A SYSTEMATIC REVIEW

INTRODUCTION: Idiopathic inflammatory myopathies (IIMs) are autoimmune disorders characterized by muscle weakness, fatigue, pain, and, in some subtypes, rashes, dysphagia, and interstitial lung disease. As heterogenous and systemic diseases, outcome measures that are used in IIM clinical trials to assess therapeutic response, should adequately reflect the multisystem disease activity, have adequate validity in this population and include patient reported outcome measures (PROs). The primary objectives of this study are to investigate the evolving landscape of outcome measures used in IIM clinical trials over time and highlight the areas of improvement in outcome measure selection for IIM trials.

METHODS: A systematic literature review was performed across PubMed, EMBASE, CINAHL Complete, Europe PMC, ClinicalTrials.gov, and International Clinical Trials Registry Platform. Pharmacologic phase 1-3 IIM randomized controlled trials (RCTs) published between 2010-2023 were included. Two reviewers independently screened records and extracted participant demographics, trial characteristics, all primary and secondary endpoints, and PROs.

RESULTS: The search identified 834 records; 19 RCTs met inclusion criteria, representing 1,221 participants (mean age 63.7 years). Earlier RCTs predominantly used manual muscle testing (6/19) or the IMACS Definition of Improvement (4/19) as primary endpoints which were replaced by Total Improvement Score (TIS) in 2023 (5/19) Other primary endpoints included creatine kinase (CK) normalization (3/19) and functional performance indices such as six-minute walk test or dynamometry (4/19). Skin assessments shifted from heterogeneous tools to uniform adoption of the Cutaneous Dermatomyositis Disease Activity and Severity Index in 2018. PRO use dipped from 2011-2013 but rose steadily afterward, with most trials including 3-5 PROs. Earlier PROs included generic tools such as visual analog scale for pain, whereas later RCTs included Health Assessment Questionnaire Disability Index (HAQ-DI) (11/19), SF-36 (7/19), and Patient Global Disease Activity (8/19).

CONCLUSION: Over the past decade, IIM RCTs have shifted from muscle-specific endpoints toward composite, multisystem indices, reflecting recognition that IIMs extend beyond muscle involvement. However, IMACS core set measures remain only partially validated for certain IIM subtypes and heavily rely on HAQ-DI-borrowed from rheumatoid arthritis and not validated for myositis. Future trials should prioritize validated, disease-appropriate outcome measures.

Abstract/Poster #: 94
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: CON: DNP

Maja Kostic, DNP
Maja Kostic, BSN, RN (author) and Ben Inventor, PhD, CNP (advisor)

EVALUATING CONGESTIVE HEART FAILURE READMISSION PRACTICES AT AN URBAN ACADEMIC MEDICAL CENTER

INTRODUCTION: Congestive heart failure (CHF) remains a global public health issue with significant morbidity, mortality, and financial burden. Despite evidence-based interventions, 30-day hospital readmission rates for CHF at this institution continue to exceed national benchmarks. In response to penalties from the Centers for Medicare & Medicaid Services (CMS) Hospital Readmissions Reduction Program, an urban academic medical center implemented a multidisciplinary, nurse-driven CHF education program to reduce preventable readmissions. This project aimed to evaluate current CHF education practices and identify barriers affecting implementation and patient understanding.

METHODS: A program evaluation was conducted on a general medical-surgical unit caring for CHF patients. Data included staff and patient surveys, chart audits, and compliance reviews of existing CHF interventions-daily standing weights, fluid intake and output tracking, and patient education using a standardized CHF booklet. A convenience sample included 21 staff surveys, 8 patient surveys, and 30 patient record reviews (August-October 2025). Data were analyzed to assess structure, process, and outcome measures.

RESULTS: The 30-day CHF readmission rate was 43%, exceeding the national average of 18.2% and the institution's goal of 16.5%. Compliance with key CHF practices included daily weights (76%), intake/output documentation (76%), education documentation (63%), and door signage (46%). Most staff (85.7%) reported clear protocols but identified barriers including inconsistent patient cooperation (85.7%), difficulty tracking intake/output (85%), and lack of time (57.1%). While 66.7% of patients discussed CHF with staff, 75% reported low confidence in managing their diagnosis. Patients cited information overload and complex medical terminology as key barriers to understanding.

CONCLUSION: Although the medical center maintained a well-structured, evidence-based CHF education program, inconsistent implementation and communication gaps contributed to elevated readmission rates. Strengthening staff adherence through ongoing education, workflow optimization, and simplified patient teaching strategies may improve self-care confidence and reduce readmissions. Addressing both staff- and patient-reported barriers is essential to achieving sustainable improvements in CHF outcomes.

Abstract/Poster #: 95
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: RMC: M2

Luz Mata, BA
Luz Mata, Carmin Munoz Lavanderos, Rosalinda Alvarado

UNDERSTANDING PATIENT PRIORITIES: UPDATED INSIGHTS ON DEMOGRAPHIC DIFFERENCES IN SUPPORTIVE RESOURCE NEEDS IN BREAST CANCER CARE

INTRODUCTION: Breast cancer is one of the most prevalent cancers among women, yet significant gaps remain in understanding how supportive resource needs differ across demographic groups. Emotional support, patient navigation, and education can greatly influence treatment experience, but preferences for these supports are not evenly distributed. Identifying demographic variations in unmet needs is essential to designing patient-centered, equitable interventions. This study examines which supportive resources breast cancer patients believe would improve their treatment experience and how these preferences vary by race, socioeconomic status, and educational attainment.

METHODS: This cross-sectional study (June 2025-August 2025) was conducted at Rush University Medical Center. A one-time, in-person survey was administered following routine breast cancer surveillance visits for women aged ≥18 years with a history of breast cancer diagnosis and treatment. The survey assessed barriers and unmet needs; chart reviews provided additional demographic data. Men, minors, stage 4 cases, and patients with non-breast cancer diagnoses were excluded.

RESULTS: A total of 42 breast cancer patients completed the survey. Participants were predominantly White (38.1%), followed by Hispanic (31.0%), Black (26.2%), and Asian (4.8%), with a mean age of 61.5 years. Most held a bachelor's degree (28.6%) or high school diploma (19.1%). Patients most frequently identified a need for more general breast cancer information (27.3%) and emotional support (22.7%). Resource preferences varied by education and race: individuals with lower educational attainment more often preferred written materials, while those with higher education favored online sessions. Asian and Latino patients showed the highest preference for educational videos.

CONCLUSION: Emotional support, patient navigators, and more information about breast cancer were the most desired patient-identified resources to improve their experience. Resource preferences varied by education and race, highlighting the need for tailored, patient-centered support during breast cancer treatment. Tailoring supportive resources to patients' demographic backgrounds may enhance adherence, reduce disparities, and improve long-term outcomes.

Abstract/Poster #: 96
Session: Oral Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: CHS: MS

Kelsey Page, BS
Kelsey Page, BS (Rush); Joshua Teitcher, MS-HSM, CCC-SLP (Rush); Lisa LaGorio, PhD, MPH, CCC-SLP (Rush)

THE EFFECTS OF GLOSSECTOMY ON TONGUE STRENGTH AND SWALLOWING OVER TIME

INTRODUCTION: Squamous cell carcinoma (SCCA) of the tongue is the most common cancer of the oral cavity. Dysphagia, i.e. swallowing difficulty, is a common morbidity following surgical resection and adjuvant therapy (i.e., radiation therapy and chemotherapy) for SCCA. Postoperative dysphagia typically involves oral phase impairments including prolonged oral transit time, with greater resection ranges and the addition of adjuvant radiotherapy linked to more severe dysphagia. Decreased tongue pressure has been associated with dysphagia in stroke and neuromuscular disorders. Further, tongue pressure is favorably correlated with dysphagia screening outcomes in tongue cancer patients. Existing evidence demonstrates an immediate decrease in tongue pressure post-hemiglossectomy, followed by gradual recovery over time. Larger resections are associated with greater reductions in tongue pressure, whereas smaller resections show lesser decline. However, no research has investigated tongue pressure recovery patterns across a broader range of glossectomy patients. This retrospective study investigated the relationship between tongue pressure and physiologic-based swallowing outcomes over the recovery period in glossectomy patients.

METHODS: Participants included all patients with SCCA of the oral tongue who underwent glossectomy and received speech-language pathology services between July 1, 2020, and June 30, 2025. Medical records were reviewed and extracted outcomes included tongue pressure measured via IOPI, and swallowing measures including the MASA-C, FOIS, IDDSI, and DIGEST and MBSImP. Summary statistics were used to characterize group mean data, and repeated measures ANOVA were used to compare outcomes over time. Inclusion and type of adjuvant therapies, as well as the range of surgical resection, were analyzed as covariates.

RESULTS: Analysis is ongoing. Preliminary results show a strong relationship between tongue pressure and swallowing outcomes, with higher pressures linked to better outcomes. Further detail to be presented on the poster, along with data on analyzed covariates (e.g., adjuvant therapies, range of resection, gender, and age).

CONCLUSION: Preliminary analysis suggests that tongue pressure follows previously reported recovery patterns, with the greatest decline occurring immediately following resection and gradually improving thereafter. Larger reductions in tongue pressure appear to correspond with poorer swallowing outcomes, while smaller decreases are associated with better swallowing outcomes.

Abstract/Poster #: 97
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: Clinical Fellow

Haley Plattner, MD
Haley Plattner (Rush); Elyse Fults (Rush); Thomas Alcorn (Rush); Sara Hock (Rush)

IMPROVING FREQUENCY AND COMPETENCE IN CONSULTATION THROUGH CURRICULAR INNOVATION AND SIMULATION IN THE EMERGENCY MEDICINE CLERKSHIP

INTRODUCTION: Effective consultation is an essential skill for incoming residents, yet formal training remains limited. The objective of our study is to provide a training module to fourth-year medical students on their required Emergency Medicine (EM) clerkship and to assess improvement in student engagement and confidence in this skill and for long-lasting improvement in communication skills as demonstrated by their performance on their mid-year M4 Objective Structured Clinical Examination (OSCE) on calling a consultant.

METHODS: A targeted needs assessment identified deficiencies in M4 consultation skills during the newly developed OSCE. We engaged senior students during their EM rotation, during which they completed a pre-survey, a teaching session on a structured method for calling a consultant, and peer practice with feedback. Students were naturally divided into a study group, those who completed their EM rotation prior to the mid-year M4 OSCE, and a control group, who completed their rotation off site or after the M4 OSCE. During the OSCE, all students were assessed on their consultation skills through a written consultation. A survey assessing confidence and consultation frequency was obtained at the time of the assessment. Pre-survey, post-survey, and OSCE performance data were analyzed for improvements in OSCE scores and increases in confidence and engagement of medical students when calling a consultant.

RESULTS: Thus far, 70 students have completed their EM rotation and pre-survey, and 21 students have completed their OSCE. The remaining 120 students are scheduled for assessment, with full results expected by March. Early qualitative feedback from EM faculty indicates that students who participated in the module show improved competence and confidence when calling consultants during clinical shifts.

CONCLUSION: We hypothesize that the provided teaching module will increase both student confidence and engagement with calling consultants. Because this skill is an entrustable professional activity expected of students entering their residency, the benefits of this are immense. We anticipate that this module will improve examination scores, enhance preparedness for residency, and most importantly, increase patient safety, as students who call consultants during shifts will be better equipped to engage in effective communication, enabling more efficient and safer patient care.

Abstract/Poster #: 98
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: Clinical Resident

Yazmin Rustomji, MD
Yazmin Rustomji, MD (Rush), Jinal Patel, MD (Rush), Abhaya Trivedi, MD

STANDARDIZING PATIENT TRANSFERS TO THE INTENSIVE CARE UNIT, A QUALITATIVE STUDY

INTRODUCTION: Medical handoff standardization is a widely discussed topic in modern medicine. The current literature has evaluated within-unit and between-unit transfers; however, few studies have examined handoffs from the general medical floor (GMF) to the intensive care unit (ICU). Predictive algorithms such as the National Early Warning Score (NEWS) help identify high-risk patients. The goal of this study was to use the NEWS to identify high-risk patients and prepare a standardized handoff template in case the patient transferred to the ICU.

METHODS: The design was a two-stage pre- and post-qualitative study. A standardized note template was created for GMF to ICU transfers, based on the current ICU-PAUSE note template and feedback from a focus group of internal Medicine residents. The intervention took place during the 2024-2025 academic year. A prepared slideshow was presented to the day shift PGY-1s on NEWS and the template. Night shift PGY-1s received pre- and post-surveys, including five-point Likert scales to assess resident confidence during transfers, as well as the frequency of POA discussions, code status discussions, and pended transfer notes before signout.

RESULTS: 38 Internal Medicine PGY-1 residents were emailed pre- and post-surveys, 18 completed the pre-survey, and 12 completed the post-survey. Post-intervention, residents reported increased comfort and preparedness to transfer a patient to the ICU. Residents reported increased frequency of discharge summaries and transfer notes pended for high-risk patients. Residents also reported increased discussions regarding a patient's power of attorney and goals of care during signout. Free-response feedback on the transfer template was positive, including more succinct information, more efficient transfers, and improved structured communication.

CONCLUSION: Studies have shown that clinicians perceive improved patient safety with standardized handoffs. While most improvement strategies focus on within-unit or ICU-to-GMF transfers, this study highlights the need for improvement from GMF to the ICU. This template has improved resident confidence and preparedness, and allowed for clearer communication regarding POA and GOC status, which may not be easily accessible in the chart. More research is ongoing to expand its use beyond preparing high-risk patients and to examine its use by non-Internal Medicine residents.

Abstract/Poster #: 99
Session: Oral Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: RMC: M2

Ohm Shukla, MS
Ohm Shukla, MS (Rush), Elyse Fults, MD (Rush), Haley Plattner, MD (Rush), Richard Conner, EMT-P (Malcom X), Nicholas Cozzi, MD, MBA (Rush), Sara M Hock, MD (Rush)

IMPROVING PEDIATRIC RESUSCITATION AND HANDOFFS USING INTERPROFESSIONAL TRAINING FOR PARAMEDICS AND EM RESIDENTS

INTRODUCTION: The transfer of patient care from emergency medical services (EMS) to the emergency department (ED) is a pivotal moment that demands clear communication and coordinated teamwork in a high-stress setting. Pediatric resuscitations, while rare, are among the most high-acuity scenarios and require focused training for both EMS and ED clinicians. Despite working side by side during these critical events, paramedics and emergency medicine (EM) residents are typically trained in isolation. This separation limits mutual understanding of workflows, capabilities, and constraints-factors that can complicate collaboration and compromise the quality of the handoff. In this study, the aim was to explore a structured interprofessional simulation training curriculum in pediatric resuscitation to evaluate the feasibility and impact on trainee confidence in teamwork and handoff.

METHODS: A novel interprofessional simulation curriculum was developed in collaboration with simulation and EMS experts. Paramedic trainees, EM resident physicians, and medical students were recruited to participate in the pilot exercise. Participants were split into groups, each with 2-4 paramedic students and 2-4 residents. Each group engaged in two pediatric resuscitation scenarios that involved prehospital care, handoff, and emergency department components. Data collection included pre- and post-surveys including demographic data, role familiarity, handoff confidence, and qualitative feedback.

RESULTS: A total of 41 learners participated in the study. Emergency medicine residents demonstrated an increased rating in average familiarity with the opposite role from 3.00 (SD = 0.93) on the presurvey to 4.07 (SD = 0.83) on the postsurvey, and an increase in average confidence in working with paramedic students from 3.26 (SD = 0.96) to 4.14 (SD 0.77). Paramedic students showed an increase in confidence in working with residents from 2.72 (SD = 1.10) to 3.41 (SD = 1.01). Major themes identified included collaboration, role learning, clinical content, and positive feedback on the training.

CONCLUSION: This interprofessional simulation curriculum demonstrates that co-training of emergency medicine residents and paramedic students is both feasible and well-received. The pilot implementation demonstrated enhanced role awareness in emergency care and showed increases in confidence during patient handoff and cross-collaboration for both participant groups. These findings support the inclusion of structured EMS and EM resident co-training in each program's curriculum.

Abstract/Poster #: 100
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: RMC: M2

Ryan Welsh, BS in (Biochemistry
Ryan Welsh BS, Renad Abu-Sawwa (PharmD, BCPPS)

Evaluating the Impact of a Clinical Pharmacist-Designed Neuropharmacology Curriculum in Undergraduate Medical Education

INTRODUCTION: Pharmacology is consistently reported as one of the most challenging components of preclerkship medical education, particularly in subspecialty domains such as seizure pharmacology, where diverse mechanisms of action, pharmacokinetics, and toxicity profiles challenge comprehension. Clinical pharmacists possess specialized expertise that may enhance pharmacology instruction when integrated into undergraduate medical curricula. In 2022, Rush Medical College implemented a curricular change in which a clinical pharmacist assumed responsibility for teaching and assessment development for seizure pharmacology content in the neurology block. This study evaluates the impact on exam items and results.

METHODS: This retrospective, descriptive study analyzed de-identified assessment data from neurology block exams between 2020 and 2024. Seizure pharmacology questions were identified and coded for cognitive level (Bloom's taxonomy), item difficulty, and point-biserial coefficient. Items were grouped into pre-intervention (2020-21, pharmacologist-led instruction) and post-intervention (2022-23, clinical pharmacist-led instruction) cohorts. Group differences were examined using descriptive statistics and Mann-Whitney U tests.

RESULTS: Seventeen seizure pharmacology assessment items were included (2020-2024). The mean difficulty was 0.848 ± 0.0609 [0.787 - 0.908] (SD 0.0879, IQR 0.125) pre-intervention and 0.694 ± 0.124 [0.570 - 0.819] (SD 0.190, IQR 0.255) post-intervention ($p > 0.05$). The mean point-biserial coefficient was 0.341 ± 0.117 [0.224 - 0.459] (SD 0.169, IQR 0.26) pre-intervention and 0.321 ± 0.103 [0.218 - 0.424] (SD 0.158, IQR 0.28) post-intervention ($p > 0.05$). In contrast, there was a significant shift toward higher-order Bloom's taxonomy levels following the intervention ($p < 0.05$ calculated by assigning levels to each item and conducting a Mann-Whitney U test), accompanied by a broader distribution of pharmacology subtopics and clinical skill categories. Overall, discrimination remained greater than 0.30, an expected value for medical education assessments.

CONCLUSION: Transitioning seizure pharmacology instruction to a clinical pharmacist broadened the cognitive complexity and clinical relevance of assessment items. Although mean item difficulty was slightly lower post-intervention, this difference was not statistically significant, and discrimination indices remained above 0.30. These findings suggest that increasing higher-order cognitive demands did not compromise assessment reliability. This supports the integration of clinical pharmacists in preclerkship pharmacology curricula to promote more conceptually rigorous and clinically meaningful learning.

Abstract/Poster #: 101
Session: Poster Presentation
Theme: Clinical Practice III: Medical Education, Patient Experience & Supportive Care
Trainee Rank: RMC: M2

Elise Winn, BS
Elise Winn (Rush); Ummesalmah Abdulbaseer (Rush); Alefiya Al-Qamari (Rush)

BLOOD, SWEAT, TEARS, AND BELIEFS: EXPLORING A CASE OF EMERGENT EXPLORATORY LAPAROTOMY DUE TO ANEMIA IN A JEHOVAH'S WITNESS PATIENT

INTRODUCTION: This case explores the complexity of navigating patient autonomy and non-maleficence amid religious beliefs. Over 1 million members of the Jehovah's Witness (JW) faith live across the United States. One tenet of their faith is not accepting blood products as they view blood as life, and that God forbids blood from entering the body through food or transfusions. This can pose a great ethical challenge for healthcare providers caring for JW patients with acute anemia.

CASE PRESENTATION: A 65 year-old woman with a history of Crohn's Disease, Behcet's Disease, and iron-deficiency anemia presented with fatigue, rectal bleeding, abdominal pain, and hypotension (BP 70/50s) for a few days. Initial labs revealed acute anemia with a hemoglobin (Hb) of 7.6, leading to ICU admission. CT imaging showed no active arterial bleeding. A blood transfusion was offered, however the patient and her husband declined, as they are members of the JW faith. They consented to erythropoietin (EPO) and IV iron, and referred their team to a JW liaison to discuss additional products she could receive. Colonoscopy revealed significant ileal mucosal ulceration, however was unsuccessful at hemostasis. Despite exhausting all allowed non-blood products (cryoprecipitate, blood factors, and albumin), her bleeding persisted and Hb decreased to 4.1. The only option remaining was emergent exploratory laparotomy. After much deliberation and shared decision-making, steadfast against blood products, the patient consented to this high-risk surgery. She underwent small bowel resection with ileostomy creation. Patient consented to autologous blood salvage, however autotransfusion was not pursued due to minimal blood loss. She improved clinically post-operatively on EPO and iron infusions, and her Hb improved to 7.4 at discharge 16 days later.

CONCLUSION: Upholding patient autonomy by respecting religious values that shape patients' healthcare decisions and behaviors builds trust with healthcare providers and improves patient satisfaction. Providers should engage in shared decision-making with patients, their families, and, if requested, their spiritual leaders to ensure that care aligns with the patient's beliefs and preferences. Utilizing a patient-centered approach to discuss medical management, when traditional approaches cannot be considered in respect of a patient's religious or cultural beliefs, can improve patient care and outcomes.

Abstract/Poster #: 102
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: Post-Doctoral Research Fellow

Lily Caglianone, BS
Lily Caglianone, BS (Rush Clinical Research MS), Raeesh Vahora (Rush University), Sarah H. Ailey PhD RN FAAN CDDN PHNA-BC CNE (Rush University)

PREVENTIVE CARE DISPARITIES IN WOMEN WITH SEVERE MENTAL ILLNESS: PREDICTORS OF MAMMOGRAPHY SCREENING AND THE ROLES OF CONTINUITY, ANXIETY, AND NEIGHBORHOOD DISADVANTAGE

INTRODUCTION: Women with serious mental illness (SMI) experience disproportionately low rates of preventive cancer screening, including mammography. However, little is known about how screening readiness, particularly being overdue at the time of care, affects mammography completion within this population. Understanding both structural and process-of-care contributors is essential for designing interventions to improve screening uptake.

METHODS: We conducted a retrospective cohort study of women aged ≥40 years with serious mental illness (categorized as schizophrenia-spectrum disorders or bipolar disorder) within Rush University Medical Center. Electronic health record data identified 7,186 eligible women who were due for mammography at the first visit of a screening interval. The primary outcome was mammography completion within 90 days; the primary exposure was overdue status at interval start. Demographic, clinical, social, and healthcare access variables were extracted. Multivariable logistic regreworssion estimated adjusted odds ratios (aORs). Interaction analyses tested whether anxiety modified associations. Additional process analyses examined mammography order placement. Sensitivity analyses incorporated CPT-only completion definitions.

RESULTS: Only 11.9% of women completed mammography within 90 days. Being overdue at interval start was the strongest predictor of non-completion (aOR = 0.057; 95% CI: 0.047-0.069). Older age, non-public insurance, current smoking, and greater distance to the facility were associated with lower completion, while identifying as Asian and having a higher comorbidity index were associated with higher completion. Anxiety modified the effect of overdue status (interaction aOR = 1.65; 95% CI: 1.11-2.44). Order placement was strongly associated with completion: 85.7% of completers received an order vs. only 11.4% of non-completers. Sensitivity analyses and SMI-subtype models yielded similar findings, confirming robustness.

CONCLUSIONS: Among women with SMI, being overdue for screening at the point of clinical contact is a major barrier to mammography completion and appears to represent accumulated structural and behavioral challenges. Interventions that proactively identify overdue patients, strengthen primary care engagement, automate or standardize order placement, and tailor support for women with anxiety may meaningfully improve screening rates. These findings highlight critical opportunities to reduce preventable cancer disparities in women living with SMI.

Abstract/Poster #: 103
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Jessica Dorcelien, BA
Jessica Dorcelien, BA (Rush Medical College); Brittney Lange-Maia, PhD, MPH (Rush University Medical Center); and Victoria Poole, PhD (Rush University Medical Center)

EXPERIENCES OF MAJOR DISCRIMINATION AMONG OLDER BLACK AMERICANS

INTRODUCTION: The older adult population in the US is becoming increasingly diverse. Understanding life experiences may provide unique insight into late life health and well-being, particularly among diverse groups.

METHODS: Participants were Black adults free of Dementia from the Minority Aging Research Study (MARS) who completed a modified version of the Major Experiences of Discrimination survey quantifying the frequencies and impact of lifetime experiences of discrimination across various settings. We examined the prevalence of various discriminatory experiences, including settings, attributes, and coping mechanisms among this sample.

RESULTS: Among our 146 participants, (91.1% female, mean age 80.5), 79.37% reported having at least one major experience of discrimination at some point in their lifetime. Regarding settings, 66% reported discrimination in employment, 30% when receiving services, 29% in education, 29% in law enforcement, and 18% in housing. Among those reporting a primary reason for experiencing discrimination (N = 74), 72.97% believe that their race was the primary reason. However, roughly 75% of these respondents believe that discrimination had little or no impact on their ability to have a full and productive life. Participants indicated a variety of coping mechanisms for dealing with discrimination, including praying about the situation (40%), talking to someone (32%), and trying to do something about it (29%).

DISCUSSION: Major experiences of discrimination are common among older Black adults. Although discrimination occurs in a variety of settings, the self-reported impact of discrimination on lifetime productivity is minimal, and variability exists among endorsed coping mechanisms. Our findings quantify and categorize experiences of major discrimination and their lasting impact among older Black adults. As a future direction, we aim to assess how these experiences are associated with late life health and well-being, including cognitive outcomes, overall health status, depressive symptoms, and loneliness. Further, research on resilience mechanisms which contribute to reduced impact of discriminatory experiences is warranted.

Abstract/Poster #: 104
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: Clinical Resident

Alexandra Eckburg, BA, MD
Alexandra Eckburg (Rush); Haley Gainer (Rush); and Kyle Amber (Rush)

DETERMINING THE UTILITY OF PRICE ESTIMATOR TOOLS IN DERMATOLOGY WHEN SEARCHING WITH LAYMAN'S TERMINOLOGY

INTRODUCTION: In 2019, the Executive Order on Improving Price and Quality Transparency in American Healthcare required that hospitals make their standard charges for medical services publicly available. Unfortunately, hospital chargemasters are typically machine-readable files that include innumerable Current Procedural Terminology (CPT) codes and technical jargon. The Centers for Medicare and Medicaid Services (CMS) now requires that hospitals must also provide a "display of shoppable services in a consumer-friendly format." Our study queried hospital price-estimators to evaluate not only their usability and inclusion of dermatology procedures, but also their ability to provide correct results when searched using lay terminology.

METHODS: We queried hospital price-estimators affiliated with an Accreditation Council for Graduate Medical Education (ACGME) accredited dermatology residency to ensure that all systems assessed provided dermatologic care. We searched for pricing of shave and punch biopsies, as well as cryodestruction of benign or malignant entities using procedural codes, CPT terminology, or lay terms. Of included procedures, quoted prices were recorded and compared with the corresponding population size and average household income of the county for each institution utilizing the US Census Quick Facts database. Estimators were considered usable when they were easily accessible online and able to be searched without entering personal information.

RESULTS: 140 hospital systems were queried, of which 96 (68.6%) had usable chargemasters. Of those 96 institutions, 34 (35.4%) included at least one dermatology procedure and 11 (11.5%) included all four dermatology procedures. Search results using layman's terms were variable (0-15.24%). Searching with CPT codes was most successful. Quoted cash prices varied widely across institutions and had no significant correlation with associated population size (ρ=0.15, P=0.40) or mean household income (ρ=0.25, P=0.15).

CONCLUSION: This data demonstrates that while hospital price-estimators are readily available, few include dermatology procedures or optimization to provide results when searched with layman's terminology. The wide variability in quoted prices indicates a still unmet need for price transparency allowing potentially large cost savings. Thus, hospital-based cost tools are only beneficial to the subset of patients seeking care at larger institutions. Nonetheless, a still unmet need exists for searchable charges for commonly utilized dermatologic procedural codes.

Abstract/Poster #: 105
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: CON: MS

Aaliyah Ellison-McPeters, BS
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INCLUSIVE HAIRCARE EDUCATION: ADDRESSING HAIR AND SCALP HEALTH INEQUITIES IN PATIENT CARE

INTRODUCTION: Significant gaps persist in dermatologic training regarding the evaluation and management of hair and scalp conditions in patients with diverse hair types and textures1. African American hair has distinct structural properties that increase susceptibility to certain conditions and forms of mechanical trauma2. Additionally, Black hair carries cultural, social, and historical significance, and many individuals express this identity through a variety of styling practices such as twists, braids, locs, extensions, and other tension-bearing hairstyles. However, most medical curricula provide limited instruction on examining textured hair or understanding these styling practices, contributing to diagnostic challenges, communication barriers, and inequities in care3. Few structured educational interventions currently exist to equip trainees with practical skills in textured-hair assessment and hygiene counseling. This project aims to develop Inclusive Haircare Workshops focused on Black hair structure, common styling practices, and scalp examination techniques to improve trainee knowledge, build patient trust, and support more equitable dermatologic care.

METHODS: Workshops were conducted at Rush University Medical Center and included demonstrations of scalp assessment, instruction on tension-bearing and protective styles, and guidance on textured-hair tools and hygiene practices. Participants were recruited through email and social media. Pre- and post-event surveys assessed clinician comfort with scalp examination, understanding of textured-hair needs, and confidence in selecting appropriate products and tools. Descriptive statistics, including means and frequency distributions, were used to evaluate changes in perceived knowledge and comfort.

RESULTS: 25 pre- and post-event surveys were administered. Of which 20 participants reported limited knowledge of Black hair care prior to the workshop. Post-event surveys indicated participants' increased confidence in scalp assessment, improved understanding of textured-haircare needs, and greater cultural awareness. Workshops also encouraged advocacy for inclusive patient-care practices. Data collection is ongoing, and full results will be reported upon completion of data analysis.

CONCLUSION: These reproducible workshops address a documented educational gap in caring for textured and diverse hair types. Although limited by single-site implementation and reliance on self-reported measures, this model offers a scalable approach to integrating inclusive haircare education into medical training and advancing equitable dermatologic practice.

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ASSESSING RELIGIOUS INCLUSIVITY AT A MAJOR URBAN MEDICAL CENTER IN THE MIDWEST: PERSPECTIVES OF MUSLIM HEALTHCARE TRAINEES, FACULTY, AND STAFF

INTRODUCTION: Religious accommodations within healthcare institutions are integral to not only workforce inclusivity but also to the quality of patient care provided. Promoting a culture of inclusivity and accommodation allows such institutions to empower healthcare workers to be grounded in their religious identity while fostering an awareness of diverse traditions. This, therefore, enhances the delivery of culturally and religiously informed care. Muslim healthcare providers, for example, find challenges around securing access to prayer spaces, abiding by dietary restrictions, and navigating discrimination. These barriers can negatively impact provider well-being and limit their ability to deliver equitable, patient-centered care. To better understand institutional inclusivity, a goal of the healthcare system, we examined how a large, urban medical center in the Midwest accommodates the needs of its Muslim trainees, faculty, and staff.

METHODS: We conducted a cross-sectional, comprehensive survey of healthcare trainees, faculty, and staff who identified as Muslim, across the healthcare system, including medical students, residents, nurses, and ancillary staff. The 70-item survey measured perceptions of religious accommodation across domains such as accessibility of prayer and reflection spaces, dietary provisions, and experiences of prejudice and discrimination.

RESULTS: Preliminary findings suggest that although the medical center offers foundational Muslim resources such as accessible, designated prayer areas, many other crucial needs remain largely unmet. For example, fewer respondents noted access to wudu facilities, halal food, or consistent time off for Eid. Respondents also noted variability across clinical experiences as well as generalized concerns regarding discrimination and micro-aggressive comments. Importantly, those who felt institutional support were more likely to have increased trust in the institution and provide high-quality, culturally responsive patient care.

CONCLUSION: Our survey findings highlight both the progress and challenges in developing an inclusive culture at a major urban medical center. By strengthening accommodations beyond prayer spaces and addressing systemic gaps, healthcare institutions can not only improve provider well-being but also enhance institutional trust and delivery of high-quality care. These results emphasize the need for medical education initiatives and institutional policies that ensure inclusivity across faith groups, illustrated here through the experiences of Muslim trainees, faculty, and staff.

Abstract/Poster #: 107
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

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Dr. Chuka Emezue, Ph.D. (Rush College of Nursing) Dr. Tricia Johnson, Ph.D (Rush Health Systems Management) Dr. Katherine Bean, MD (Rush Department of Neonatology)

THE IMPACT OF INTIMATE PARTNER VIOLENCE ON BREASTFEEDING: DISPARITIES BY INFANT GESTATIONAL AGE AND MATERNAL SOCIODEMOGRAPHIC CHARACTERISTICS

INTRODUCTION: Breastfeeding plays a critical role in promoting maternal and infant health and development; yet, disparities in breastfeeding initiation and continuation persist. Intimate Partner Violence (IPV) is a pervasive form of physical, psychological, and sexual abuse and trauma affecting 1 in 4 US women of childbearing age in their lifetime. IPV before or during pregnancy can undermine a mother's ability or decision to initiate and continue breastfeeding. However, little is known about how IPV impacts breastfeeding behaviors across infant gestational age (GA) and how sociodemographic factors may compound this risk. This study examines the impact of IPV on mothers' breastfeeding initiation and continuation at 12 weeks postpartum by infant birth GA (early preterm ≤33 weeks, late preterm 34-36 weeks, and term ≥37 weeks).

METHODS: We conducted a cross-sectional analysis of 149,770 postpartum women from the 2017-2021 Pregnancy Risk Assessment Monitoring System (PRAMS), a CDC population-based survey. Chi-square analysis was used to examine how IPV before or during pregnancy impacts breastfeeding initiation and continuation at 12 weeks by infant GA.

RESULTS: IPV prevalence was highest among mothers < 19 years old compared to 25-34 years old (7.6% vs 2.7%), Black and Hispanic mothers compared to White mothers (4.9% and 3.5% vs 2.8%), and mothers with lower education levels compared to a bachelor degree or higher (5% vs 1%), (p<.001). Mothers exposed to IPV who delivered ≤33 weeks GA had significantly lower breastfeeding initiation (82.9% vs 89.1%, p=.017) and continuation (38.6% vs 58.1%, p<.001) than unexposed mothers. Among late preterm deliveries, only continuation differed significantly (42.3% vs 60.8%, p<.001). For term deliveries, IPV exposure was linked to lower initiation (82.8% vs 88.3%, p<.001) and continuation (52.9% vs 71.1%, p<.001).

CONCLUSION: IPV exposure was associated with decreased breastfeeding initiation and continuation, with the strongest effects in preterm infants at the highest developmental risk. Moreover, socioeconomically vulnerable mothers face compounded vulnerabilities and are disproportionately affected by IPV. These disparities in IPV exposure and breastfeeding outcomes underscore the need for trauma-informed IPV screening and tailored lactation support to advance maternal and infant health. Future research should investigate effective breastfeeding support for populations impacted by IPV, particularly within high-risk sociodemographic groups.

Abstract/Poster #: 108
Session: Oral Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: CON: DNP

Kristen Halko, BSN
Academic Facilitator: Dr. Elizabeth Simkus, DNP, FNP-C, DipACLM (Rush University) Academic Advisor: Dr. Angela Moss, PhD, MSN, APRN-BC, RN, FAAN, FAAP (Rush University)

A COMPREHENSIVE EVALUATION OF AN APRN-LED PREVENTION CENTER: INVESTIGATING APPOINTMENT ADHERENCE IN LIFESTYLE MEDICINE AND RISK FOR METABOLIC SYNDROME

INTRODUCTION: Referring patients to lifestyle-medicine prevention clinics supports primary care providers through a team-based, patient-centered approach that addresses behavioral health needs often missed in routine visits. These programs enhance continuity of care and may yield significant cost savings (Bharati et al., 2022; Coleman, 2025; Frates et al., 2024; Pronovost et al., 2021). Yet among more than 100 million specialist referrals generated annually in U.S. ambulatory care, only about half are completed (IHI, 2017). At an Advanced Practice Registered Nurse (APRN)-led Prevention Center, 2,128 referrals in one year resulted in only 12% completed new-patient visits, highlighting gaps in care continuity and the need to evaluate the referral process.

METHODS: This evaluation used the CDC program-evaluation and RE-AIM frameworks to assess reach, implementation, and system-level outcomes. A mixed-methods design included stakeholder surveys, semi-structured interviews, focus groups, and electronic health-record chart reviews conducted between June 1 and August 31, 2024. The project received Institutional Review Board approval. Analyses examined teamwork, organizational culture, appointment-adherence strategies, and barriers to converting referrals into completed new-patient visits.

RESULTS: The chart review (n = 558) reflected a predominantly female cohort (70%) and a racially diverse population, including individuals identifying as Black (n = 245), White (n = 160), Hispanic or Latino (n = 89), White-Hispanic or Latino (n = 22), Asian (n = 17), and other multiracial or ethnic identities (n = 9). Obesity was the most common metabolic-syndrome biomarker, present in 72% of patients. MyChart survey findings (n = 76) showed that 55% of respondents did not fully understand their referral, and 59% received no scheduling support or explanation of what to expect. In open-ended responses (n = 44), 25% emphasized the need for clearer phone communication and consistent follow-up. Staff surveys (n = 7) and interviews (n = 8) identified insufficient staffing, workflow inefficiencies, and communication gaps as major barriers to referral conversion.

CONCLUSION: This evaluation found that workflow inefficiencies, limited staffing capacity, delayed patient engagement, and communication gaps undermine referral completion. Findings support the need for standardized referral procedures, strengthened patient-centered communication, improved team-based coordination, and further research on centralized access models and demographic factors to ensure equitable access to lifestyle-medicine services.

Abstract/Poster #: 109
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Kevin "Seok Gyu" Han, BA
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CAREGIVING PERCEPTIONS OF ADULT-CHILD AND SPOUSAL CAREGIVERS FOLLOWING LONG-TERM CARE PLACEMENT OF A FAMILY MEMBER WITH DEMENTIA

INTRODUCTION: Family members of persons with dementia continue to perceive themselves as primary caregivers even after placing their family members with dementia in long-term care (LTC) facilities. This ongoing role perception contributes to increased negative emotions and chronic grief. Spousal and adult-child caregivers may experience caregiving differently after LTC placement, yet little research has compared these groups. This secondary analysis explored caregiving perceptions, grief, and depressive symptoms among spousal and adult-child caregivers after placement of their family member with dementia in LTC facilities.

METHODS: This cross-sectional, descriptive study analyzed baseline data from two intervention trials focused on grief management among family caregivers of persons with dementia in LTC. Outcomes included: (1) caregiving perceptions (conflict with facility staff, role captivity, guilt, relationship loss), (2) grief (personal sacrifice burden, heartfelt sadness and longing, worry and felt isolation), and (3) depressive symptoms. These baseline data were derived from assessments of 159 caregivers using the Family Perceptions of Caregiving role (FPCR) scale, the Marwit-Meuser Caregiver Grief Inventory, and the CES-D 20-item scale. Descriptive statistics and independent t-tests of these results were conducted using SPSS version 31.0.

RESULTS: Among 159 caregivers, 127 (79.9%) were adult children and 32 (20.1%) were spouses. Spousal caregivers (mean±standard deviation [M±SD]=73.75±6.59) were significantly older than adult-child caregivers (M±SD=57.13±8.46; $p<.01$). While time since LTC placement did not differ by spousal and adult-child groups ($p\geq.05$), their emotional responses varied. Spousal caregivers reported significantly greater perceptions of relationship loss with their spouse with dementia compared with adult children (spouse: M±SD=34.37±7.07 vs. adult child: M±SD=30.32±7.91; $p<.01$). In contrast, adult child caregivers scored higher on the worry and felt isolation subscale of chronic grief than spousal caregivers (spouse: M±SD=39.56±10.11 vs. adult child: M±SD=45.31±13.91; $p=0.02$). No significant differences were found for depressive symptoms between the two groups ($p\geq.05$).

CONCLUSION: Findings indicate that spousal and adult-child caregivers experience different emotional challenges after placing a family member with dementia in LTC facilities. These distinct patterns highlight the importance of developing tailored interventions that address the unique grief and emotional needs of each caregiver group following LTC placement.

Abstract/Poster #: 110
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M1

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FAITH AND TRUST: RELIGIOUSLY INFORMED CARE IN THE PHYSICIAN-PATIENT RELATIONSHIP

INTRODUCTION: For many patients, religion is foundational, shaping identity, moral frameworks, and even health decisions. Yet, religious concerns are often overlooked in clinical practices or solely addressed through chaplaincy. Religiously Informed Care (RIC), defined as healthcare providers' ability to recognize, respect, and accommodate patients' religious beliefs and practices, remains an essential, but under-looked component of equitable, patient-centered care. Research shows that minoritized groups often distrust healthcare systems due to historical discrimination and frequently seek trust in religious institutions. This suggests that RIC may strengthen trust within clinical encounters. Despite growing emphasis on cultural humility, little empirical work examines how religious accommodations affect care experiences or trust. This study seeks to address a critical gap in understanding how RIC may impact trust in physicians.

METHODS: We surveyed adult patients from outpatient clinics at a large urban academic medical center. The survey assessed religious identity, the importance thereof, and whether physicians had acknowledged/accommodated these beliefs. Trust was measured using the Wake Forest Physician Trust Scale. Participants were also invited to share experiences of religious concerns and open-ended reflections of care experiences and unmet needs.

RESULTS: Among the initial 15 respondents, 85% reported that religion or spirituality was very or extremely important in their lives. Yet few indicated physician acknowledgment or accommodation of their beliefs. Most participants reported high trust in their current physicians, but a small subset described delaying or avoiding care due to concerns that their religious values would not be respected. Participants identified dietary restrictions, modesty, and gender-concordant care as meaningful accommodation areas.

CONCLUSION: Early findings suggest that although patients generally trust their physicians, religious needs remain underacknowledged. Most initial respondents identified as Christian, highlighting the need for broader representation of religious minorities. Sparse open-ended responses suggest patients may lack a framework for discussing religious needs in clinical settings. While gaps in RIC may not immediately impact trust scores, they risk long term disengagement, especially among minoritized faith groups. As one of the first studies to examine RIC and trust using a validated scale, these findings underscore the need to integrate RIC into training and institutional policies.

Pierce Herrmann, BS
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THE USE OF AI-POWERED MACHINE TRANSLATION IN MEDICAL RESEARCH: A COMPARATIVE STUDY OF GOOGLE TRANSLATE AND GPT-4 IN TRANSLATING RHINOLOGY LITERATURE

INTRODUCTION: The global spread of scientific knowledge is essential for progress, yet language barriers limit accessibility, especially in disciplines requiring precise terminology. Most scientific literature is in English, posing challenges for non-native speakers. Advances in machine translation, particularly AI-driven tools like Google Translate and OpenAI's GPT-4, offer potential solutions by improving translation accuracy. In medical research, accurate translations are critical to prevent misunderstandings and ensure proper application of findings. This study assesses the effectiveness of Google Translate and GPT-4 in translating complex medical texts from English to Chinese (Simplified) within the field of rhinology.

METHODS: Three peer-reviewed rhinology articles, selected for technical complexity and relevance, were translated from English to Chinese (Simplified) using Google Translate and GPT-4 without post-editing. Four native Chinese-speaking rhinologists fluent in English assessed the translations on accuracy, readability, methodology, and clinical practicality using a 5-point Likert scale. Quantitative scores were analyzed to compare performance, and qualitative feedback identified strengths and weaknesses in handling technical terminology and complex sentence structures.

RESULTS: GPT-4 generally outperformed Google Translate across all metrics-accuracy, readability, methodology, and clinical practicality-though no statistically significant differences were observed. Qualitative feedback revealed challenges for both tools, including inadequate handling of medical terminology, statistical information, and dialect specificity. These findings underscore the need for improved AI translation capabilities, especially in medical and academic contexts.

DISCUSSION & CONCLUSION: AI-driven tools like GPT-4 show promise in enhancing scientific accessibility by producing readable and contextually appropriate translations. However, their limitations at this time necessitate human oversight. A hybrid approach combining AI tools with human translators may optimize accuracy and cultural relevance, particularly for specialized texts.

Abstract/Poster #: 112
Session: Poster Award
Theme: Health Equity and Community Engagement
Trainee Rank: CON: PhD

Michelle High, MSN
Dr. Sarah Sobotka, University of Chicago Dr. Urmeka Jefferson, Rush University Dr. Wrenetha Julion, Rush University

EXPLORING CHILD DEVELOPMENT-RELATED KNOWLEDGE, ATTITUDES, AND PRACTICES OF PARENTS OF CHILDREN ASSISTED BY INVASIVE MECHANICAL VENTILATION: INTERVIEW GUIDE DEVELOPMENT

INTRODUCTION: The number of children assisted by invasive mechanical ventilation (IMV) is growing due to advances in care and improved medical technology. Parents of children with IMV undergo extensive education to learn medical caregiving skills before transitioning home. Yet little is known about their child development-related knowledge, attitudes, and practices (KAP). The purpose of this research is to develop and pilot an interview guide exploring the child development-related KAP of parents of hospitalized children assisted by IMV who are preparing for hospital discharge.

METHODS: Experts with content or methodological expertise were recruited to participate in a modified Delphi process to develop preliminary interview questions. The interview guide was piloted with English-speaking, primary caregivers/parents > age 18, of children under the age of three and assisted by IMV. Parents were recruited from a freestanding children's hospital and provided informed consent. Transcripts of audio-recorded interviews were analyzed to assess for relevance, clarity, and participant burden.

RESULTS: Ten experts participated in a modified Delphi process and reached consensus on the resulting interview guide which was piloted with five parents between June and October 2024. All parents identified as biological mothers of children requiring a tracheostomy, ventilator, and feeding tube. The interview guide was effective at eliciting mothers' child development-related knowledge, attitudes, and practices.

CONCLUSION: Due to their medical complexity and prolonged hospitalizations, children assisted by IMV are at risk for physical, cognitive and psychosocial delays. This pilot study documents the iterative and rigorous development of an interview guide to identify future opportunities to improve developmental guidance.

Abstract/Poster #: 113
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: CON: Alumni

Mariah Johnston, BA, MSN
Mariah Johnston (RUSH CON); and Skyy Sumlin (RUSH CON)

CANCER-RELATED END DIAGNOSTIC OVERSHADOWING IN PEOPLE WITH SEVERE MENTAL ILLNESS

INTRODUCTION: Diagnostic Overshadowing is a highly prevalent issue for those who have pre-existing mental illnesses. This is when healthcare professionals falsely attribute physical illnesses to mental illnesses-this misnomer leads to underdiagnosis and undertreatment of physical conditions. Those living with mental illness have a 10 to 20-year decrease in life expectancy, primarily due to physical comorbidities. The objective of this study was to examine cancer-related end diagnostic error in individuals with severe mental illness. Long-term goals included having a list of five interventions that would improve cancer-related end diagnostic error for those with mental illnesses. The research gap being filled is that few studies look at the outcomes of patients with SMI and breast cancer specifically.

METHODS: The methodology of this study was qualitative. Literature reviews of previous studies, and chart reviews of past encounters were conducted. With the collected data, we developed a mock tracer model.

RESULTS: This study indicated that amongst the sample collected, SMI and breast cancer diagnosis were commonly linked to fragmented care pathways, high rates of chronic comorbidities, systemic barriers (transportation access), and chronic mental health instabilities. Ten of the eighteen received psych referrals, five did not receive referrals, and three were already in RUSH's system for psychiatric-related issues. Amongst the group, seven of the eighteen samples had received therapy. Of the eighteen charts reviewed, all of the Social Determinants of Health (SDOH) questionnaires were incomplete. Additionally, all patients had chronic conditions other than breast cancer and SMI. The more chronic conditions patients had, the poorer the outcomes were. The most frequent mental health diagnoses were bipolar disorder, depression, anxiety, and some psychosis.

CONCLUSION: The results of this study indicated worse patient outcomes when patients have multiple comorbidities, unmet psychosocial needs and instabilities in their mental health diagnosis. This study was consequential in understanding the complexity of breast cancer patients with SMI and how these complexities could lead to increased instances of diagnostic overshadowing. There were limitations in this study. The limited sample size, n< 30, and lack of racial/ ethnic diversity reduced the generalizability of findings.

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RELIABILITY AND VALIDITY OF PATIENT RATINGS AND PHYSICIAN SELF-REPORT IN THE ASSESSMENT OF PHYSICIAN NON-ENGLISH LANGUAGE SKILLS

INTRODUCTION: Clear communication is critical for diagnosis and disease management, especially for patients with a non-English language preference (NELP). Health systems use various strategies to certify clinicians in non-English languages, and patient ratings have been proposed as one assessment method. This study aims to evaluate the reliability of patient ratings as well as the validity of patient and physician self-ratings of physician non-English language skills.

METHODS: This is an observational study leveraging data from the Language Access System Improvement (LASI) study at the University of California San Francisco (UCSF). The sample included 323 patients with NELP (Cantonese, Mandarin, or Spanish) and 32 UCSF Division of General Internal Medicine physicians. Patient ratings and physician self-ratings of physician non-English language skills (5-category) and an indicator of physician bilingual certification status (binary, validating measure) were utilized.

RESULTS: The estimated reliability/dependability coefficient (□) of a single patient rating equaled 0.29. Averaging six patient ratings yielded acceptable dependability for research (□ = 0.707). Higher reliability required averaging 10 (□ = 0.801), 23 (□ = 0.902), or 48 (□ = 0.951) patient ratings. Physician-averaged patient ratings were weakly correlated with bilingual certification status, suggesting low validity (rb = 0.28, p<.0001). Physician self-ratings had a substantially higher validity coefficient (rb = 0.75, p<.0001).

CONCLUSION: Patient ratings of physician non-English language proficiency had low estimated reliability and validity. In contrast, physician self-ratings aligned more closely with certified proficiency. Patient ratings should not be used to verify physicians' language skills but may help assess communication quality when combined with other validated tools.

Abstract/Poster #: 115
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

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DEMOGRAPHIC, COMORBIDITY, AND INSURANCE-BASED DISPARITIES IN PRE-PROCEDURAL COMBINATION MEDICAL THERAPY UTILIZATION AMONG PATIENTS UNDERGOING CAROTID ARTERY STENTING

INTRODUCTION: Peripheral artery disease (PAD) is a generalized atherosclerotic condition diagnosed in over 8.5 million individuals in the United States. This disease alters blood flow to the limbs and is associated with increased risk of MI, stroke, and death, and may impair functional status and quality of life. AHA guideline therapy includes lipid lowering therapy (ie statin), antiplatelet and antithrombotic therapy, antihypertensive therapy (as indicated), diabetes management, and lifestyle modifications. Adherence to a combination of medical therapies is associated with improved outcomes. We sought to study the association between demographics, comorbidities, and insurance with pre-procedural Combination Therapy (CT) for PAD (an ASA (aspirin)/ an antiplatelet agent AND a statin) in patients receiving Carotid Artery Stenting (CAS) to identify potential disparities in utilization and elucidate directives for quality improvement and policies to improve CT utilization and therefore outcomes.

METHODS: A retrospective analysis of patients undergoing CAS at RUMC (September 2022 - October 2024) using de-identified data from the Society for Vascular Surgery - VQI Registry was performed. Data on demographics, comorbidities, and insurance were analyzed for association with CT utilization (both aspirin (ASA)/ an antiplatelet therapy and statin), and single therapy (either therapy).

RESULTS: Among 96 patients composing our preliminary data, only 80.2% received complete CT prior to intervention. Most patients received partial therapy, with 89.6% utilizing ASA/ antiplatelet agent and 83.3% utilizing a statin. Patients on Medicaid were significantly more likely to be receiving neither therapy ($p=0.012$) compared to those insured by Medicare, commercial, or other insurer. Additionally, individuals ≥ 65 were significantly more likely on CT compared to single or neither therapy ($p=0.033$, $p=0.027$). Those with hypertension or dysrhythmia were significantly more likely to be on CT ($p=0.004$; $p < 0.001$). No other significant differences were observed across race, ethnicity, sex, or other comorbidities.

CONCLUSION: Overall, our preliminary data points to significant disparities in pre-procedural treatment of patients on Medicaid. Such insurance disparities may tie to socioeconomic factors and other systemic barriers to care, underlining the importance of advocacy and policy change to ensure equitable access to optimal care.

Abstract/Poster #: 116
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M1

Sreeya Kairamkonda, MS
Sreeya Kairamkonda (Rush University) PI: Prajakta Adsul (University of New Mexico School of Medicine, University of New Mexico Comprehensive Cancer Center)

HPV VACCINATION RATES IN NEW MEXICO AND FUTURE DIRECTIONS FOR PROMOTING THE HPV VACCINE AMONG YOUNG ADULTS

INTRODUCTION: The Human Papillomavirus (HPV) is the most common sexually transmitted infection in the U.S. and is attributed as a cause for cervical, penile, vaginal, vulvar, anal, and oropharyngeal cancers. Vaccination is an effective cancer prevention strategy and the Advisory Committee on Immunization Practices recommends HPV vaccinations for everyone between 11-26 years of age. Despite these recommendations, national rates have been consistently low (compared to other recommended vaccines) and very little research exists around HPV vaccination in New Mexico (NM).

METHODS: We used a mixed methods study design (i.e. sequential explanatory) to first describe NM's HPV vaccination rates and second, identify strategies to improve vaccination rates.

RESULTS: Findings from NM Statewide Immunization Information System data show that in 2021, 47.62% of individuals between 13-17 years have received at least one dose (of the recommended two or three doses) of the HPV vaccine. National Immunization Survey Teen data show that in 2021, individuals between 13-17 years that received at least one dose of the HPV vaccine was 80.9% for New Mexico and 76.9% for the United States. To explore challenges and opportunities to improve vaccination rates in NM, we conducted interviews with clinical and community partners, supplemented with a comprehensive literature review.

CONCLUSION: Key findings from our study include: (1) Compared to the national data, practice based data from NMSIIS reveal several opportunities for improving vaccination rates specifically for primary care providers and clinics; 2) Clinical and community partners noted building trust in communities, implementing educational interventions, and repeated reminders for the community to improve vaccination rates; (3) Given the limited research on 18-26 year olds, future research needs to be directed at examining attitudes and beliefs among young adults to inform the design of socio-behavioral interventions targeting vaccination uptake and exploring communication strategies to help young adults make informed decisions around HPV vaccinations.

Abstract/Poster #: 117
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

Zeeshan Khan, BA
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NEIGHBORHOOD-LEVEL SOCIOECONOMIC STATUS PREDICTS PREOPERATIVE SYMPTOM STATE AND POSTOPERATIVE TENDON HEALING AT TWO-YEAR FOLLOW-UP FOLLOWING PRIMARY ARTHROSCOPIC ROTATOR CUFF REPAIR

INTRODUCTION: The Area Deprivation Index (ADI), developed by the University of Wisconsin School of Medicine and Public Health, quantifies neighborhood-level socioeconomic disadvantage using 17 census-derived variables on income, education, employment, and housing. Scores are expressed as state deciles and national percentiles, with higher values indicating greater deprivation. This study examined the relationship between ADI and outcomes after primary arthroscopic rotator cuff repair (aRCR). We hypothesized that patients from disadvantaged neighborhoods would have worse baseline symptoms and inferior postoperative outcomes and healing.

METHODS: This retrospective cohort utilized data from a previously published randomized clinical trial. Patients aged 18-70 with MRI-confirmed, isolated full-thickness supraspinatus tears (1-3 cm) who underwent standardized aRCR were included. Patient-reported outcome measures (PROMs: ASES, SANE, VR-12) were collected at baseline and two years postoperatively. MRI at one year assessed healing using the Sugaya classification (grades ≥4 = re-tear), independently reviewed by two fellowship-trained radiologists, with discrepancies resolved by a third reader. ADI was assigned based on ZIP code at surgery using state deciles and national percentiles. Multivariable linear regression analyzed associations between ADI and PROMs. ROC curve analysis evaluated the ability of ADI to predict retears, with AUCs compared via DeLong's test and optimal cutoffs identified using Youden's J-index ($p < 0.05$).

RESULTS: One hundred patients met inclusion, with a mean state decile of 4.07 ± 2.18 and national percentile of 48.27 ± 22.30%. State decile correlated with baseline SANE ($p = 0.002$), VR-12 mental ($p < 0.001$), and physical ($p < 0.001$) scores. National percentile correlated with baseline ASES ($p = 0.005$), SANE ($p = 0.014$), VR-12 mental ($p < 0.001$), and physical ($p = 0.013$) scores. At two years, only ASES remained significant ($p = 0.046$). Re-tear rate was 37.3% (28/75). State decile showed acceptable re-tear prediction (AUC = 0.732), while national percentile was excellent (AUC = 0.825; $p = 0.043$). An ADI threshold of 45.3% best predicted re-tear.

CONCLUSION: Greater socioeconomic disadvantage (higher ADI) was associated with worse baseline function and higher re-tear risk after aRCR. ADI may aid in preoperative risk stratification and postoperative management planning.

Abstract/Poster #: 118
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Afi Kole, BA, MS
Afi Kole; Dr. Sheila Dugan

THE POWER OF WALKING AND COMMUNITY: MENTAL HEALTH INSIGHTS FROM A CHICAGO WELLNESS INITIATIVE

INTRODUCTION: Regular physical activity is essential for maintaining overall health, reducing the risk of chronic diseases, and improving mental well-being. However, many communities, particularly underserved populations, face barriers to consistent physical activity. Walking, as a low-cost, accessible form of exercise, provides an opportunity for physical activity for people across a range of physical ability and socioeconomic status. The Rush Walk for Wellness (W4W) is a community-led walking program supplemented with medical education from healthcare trainees. This study aimed to examine whether participation in the W4W program was associated with changes in perceived stress and mood symptoms.

METHODS: We conducted a pre- and post-survey study using the Patient Health Questionnaire-9 (PHQ-9) and Perceived Stress Scale (PSS). Basic demographic information was also collected. Survey responses were collected from participants at the first and final community walking event. A total of 47 pre-walk and 15 post-walk surveys were completed. Descriptive statistics were used to summarize demographic characteristics and aggregate mental health scores. A limitation of the study was the use of independent samples for the survey data.

RESULTS: Participants represented a diverse community population, with the majority identifying as Black/ African American and female. 62 total surveys were completed. Pre-walk engagement was strong (n=47), whereas post-walk survey completion was substantially lower (n=15). At baseline, PHQ-9 scores were in the mild to minimal range across racial and age groups. Mean PHQ-9 and PSS scores showed minimal change between pre- and post-walk groups; however, these results are not interpretable due to the small and unmatched post-walk sample. Nevertheless, this data can provide insight into the populations that participate in W4W and highlight challenges in collecting post-interventional data.

CONCLUSION: Low post-walk survey completion limited the ability to assess group aggregate changes in stress, anxiety, and depressive symptoms. Future iterations of this project can focus on optimizing survey collection methods**,** improving follow-up retention, and expanding the data capture to better assess the program's impact. Low total survey completion may reflect a possible hesitancy toward research participation, thereby highlighting a gap where we can provide better communication and time needed when introducing research.

Abstract/Poster #: 119
Session: Oral Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: CHS: MS

Eleanor Kraichely, BA
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INFLUENCE OF SOCIAL DETERMINANTS OF HEALTH AND RELATED FACTORS ON LANGUAGE RECOVERY IN ADULTS WITH STROKE-INDUCED APHASIA

INTRODUCTION: While language intervention improves outcomes for individuals with post-stroke aphasia, social and contextual factors shaping recovery remain largely understudied, particularly among African American (AA) stroke survivors in under-resourced communities (Ellis & Jacobs 2023; Boucard et al., 2025). Research often lacks demographic transparency and rarely measures social determinants of health (SDOH) when evaluating treatment effects. The Group Collaborative Referencing Intervention (G-CRI), a conversational picture-matching game-based treatment (Devanga, 2023) has demonstrated promising language gains but primarily within socioeconomically advantaged, white participants with aphasia (PWA). This study addresses a critical gap by examining how SDOH, including caregiver support, socioeconomic stability, and access to communication partners, relate to language outcomes in AA-PWA completing G-CRI.

METHODS: Employing a mixed methods design (single-case experiment with ABC design and qualitative methodologies), three AA-PWA (age range: 25-63) consented and completed G-CRI at Rush University's SCOPE pro-bono clinic. Rush IRB approved this study. Each participant completed three baselines, 10 G-CRI sessions with five treatment-probes, and two maintenance sessions. Confrontation picture naming probes were conducted at each baseline, probe, and maintenance point and scored using a 15-point scale (Porch, 1967). All sessions were video-recorded for analysis.

RESULTS: Preliminary results show naming improvements for two PWA (increase in mean score from baseline to treatment probe of 283/450 to 329/450 in PWA1 and 309/450 to 344/450 in PWA2). Tau-U analysis will be used to quantify treatment effects. SDOH variables will be assessed using an investigator-developed checklist informed by the Healthy People 2030 (HHS, 2020), and WHO SDOH domains (2008), and emerging aphasia SDOH literature (O'Halloran et al., 2023). Quantitative trajectories and qualitative themes will be integrated to identify barriers and facilitators to naming recovery. We anticipate high composite language gains among participants with greater social interaction and support consistency.

CONCLUSION: This study provides needed data on AA-PWA, a group historically underrepresented in intervention research. Findings underscore naming performance reflects lived contexts, not solely linguistic ability, and highlight the importance of integrating social and environmental factors into research design and clinical practice. Despite limitations of small sample size and ongoing analyses, results offer actionable implications for culturally responsive, contextually informed aphasia intervention.

Abstract/Poster #: 120
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

Charita Kunta, BS
Charita Kunta, Aashna Farishta, Nia N Savera, Shawn Parra, Eve Poczatek, Sheila Dowd, Ami Shah RUSH University

EXAMINING FACTORS THAT BRING HEALTHCARE TRAINEES AND WORKERS TO THE RUSH WELLNESS CENTER

INTRODUCTION: Rush University Medical Center serves thousands of patients and trains more than 2,800 students in the health sciences. The COVID-19 pandemic intensified existing pressures on healthcare workers, prompting the creation of the Center for Clinical Wellness (CCW) to support employee and trainee mental health. Prior research shows that clinician well-being is closely linked to patient safety and quality of care. This study aims to identify the stressors that drive healthcare workers and trainees to seek mental health services, to better inform supportive interventions and promote safer care delivery.

METHODS: This retrospective analysis examined de-identified data from 2,923 CCW clients (employees and students). Clients responded to the open-ended question, "What brings you to counseling at this time?" Responses were coded inductively. Four team members created an initial codebook, which was refined through three iterative rounds. Final coding was completed by two coders using Atlas.ti, with subsequent review to ensure intercoder reliability. Themes were derived through descriptive counts and analysis of code co-occurrences.

RESULTS: Anxiety or stress was the most frequently coded emotional identifier (426 mentions), followed by depression (134). The most common contributing stressors involved family, spouse, or household challenges (209) and major life transitions (149). Common goals for counseling included establishing care with a provider (144) and learning coping skills (75). Anxiety or stress frequently co-occurred with depression (number?), , learning new skills (23) and establishing care with a provider (20). Less common co-occurrences were goals related toimproving self-care (10 times). Anxiety or stress also co-occurred with transitions (36), family or household challenges (32), feeling overwhelmed at work (32), sleep issues (18), and poor self-worth (15).

CONCLUSION: Healthcare workers and trainees experience a range of personal and professional stressors that drive them to seek mental health support. Understanding these factors can inform more targeted interventions that strengthen provider well-being. Clinician well-being is closely linked to patient outcomes and improving support systems may enhance patient safety and overall care quality.

Abstract/Poster #: 121
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Lily Noonan, BS
Lily Noonan (RUSH University) and Beverley Robin (RUSH University)

PRIMARY LANGUAGE BARRIERS AND HEALTH DISPARITIES IN THE NICU

INTRODUCTION: Patients in the neonatal intensive care unit (NICU) are unique because they cannot communicate or be involved in their own care. As a result, quality family-centered care in the NICU requires positive provider-family relationships, which can be fostered through effective communication, family presence at bedside, and trust. However, families with language other than English report delays in receiving clinical updates and hesitation asking questions or sharing concerns. Limited research quantifies how primary language impacts communication in the NICU. This study compares provider communication with English-speaking families and Spanish-speaking families of patients hospitalized in the NICU. We hypothesize that Spanish-speaking families experience lower rates of provider communication compared with English-speaking families.

METHODS: A single-center retrospective study was conducted in the Rush University Medical Center (RUMC) NICU. Families were included if their documented preferred language was either English or Spanish. Maternal and newborn demographic data were extracted from the electronic medical record. To quantify provider-family communication, daily progress notes, admission notes, and discharge summaries were reviewed. Each encounter was categorized as communication completed, or communication not completed for English-speaking families, or communication completed with an interpreter or communication not completed (no documentation of interpreter use) for Spanish-speaking families. For each patient, a communication rate was calculated by dividing the number of days with documented communication in the preferred language by the infant's length of stay. Communication rates between English-speaking and Spanish-speaking families were compared using a two-sample t-test in Excel (Version 16.103.1). The study was approved by the RUMC IRB.

RESULTS: A total of 353 patients were included (318 English-speaking; 35 Spanish-speaking). English-speaking families had a higher communication rate (mean 0.88) compared with Spanish-speaking families (mean 0.26). The difference was statistically significant ($p<0.0001$).

CONCLUSION: Spanish-speaking families received significantly less provider communication compared to English-speaking families, which highlights language-related disparities in the NICU. These findings align with previous literature demonstrating language barriers contributing to gaps in neonatal care. Limitations include reliance on documentation in provider notes and the small sample of Spanish-speaking families. This highlights the need for provider education to decrease language disparities in the NICU.

Abstract/Poster #: 122
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: CHS: BS

Maria Gabriela Pino Paez, AS
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EXPLORING THE EXPERIENCES AND PREFERENCES OF HISPANIC FAMILIES SEEKING CARE FOR PEDIATRIC ORTHOPEDIC PROBLEMS: A COMMUNITY SURVEY

INTRODUCTION: Hispanic/Latinx children often face disparities in the timing and accessibility of treatment after orthopedic injuries. Community feedback and prior research suggest that Hispanic/Latinx caregivers may first seek care from traditional healers (e.g., sobadores) due to cultural relevance, affordability, faster access, and greater trust. Despite these patterns, little research has examined caregiver decision-making or strategies to integrate traditional and mainstream care models in the United States. We hypothesize that caregivers may prefer traditional healers over physicians, but would view collaboration between the two systems as possible if key barriers are addressed.

METHODS: A bilingual REDCap survey was developed using the International Complementary and Alternative Medicine Questionnaire (I-CAM-Q) and community-informed items addressing care-seeking patterns, barriers to access, perceived effectiveness of treatment, cost, and provider trust. The goal is to recruit 120 caregivers of Hispanic/Latinx children (≤ 18 years old) to gather information about their care-seeking experiences, in partnership with community organizations in Chicago, including the 36th Ward Alderman's Office, the Northwest Center, Alivio Medical Center, and others. Community members reviewed the survey, and an interview with a traditional healer ensured cultural relevance. Data analysis will include descriptive statistics and comparisons of care-seeking decisions and perceived outcomes.

RESULTS: Data collection is ongoing. We have received 16 responses so far, and we are exploring partnerships with additional Chicago neighborhoods with large Hispanic/Latinx populations to increase recruitment. Anticipated results will describe caregivers' preferred first point of care (traditional healer vs. medical provider), key reasons influencing their choices (e.g., cost, cultural familiarity, access, perceived effectiveness), time to access treatment, and caregivers' openness to collaboration between traditional healers and physicians.

CONCLUSION: Understanding how Hispanic/Latinx caregivers choose care for pediatric orthopedic injuries is essential to reduce delays in treatment and improve health outcomes. Results from this study will provide evidence to guide culturally responsive strategies, strengthen trust between families and medical providers, and support community-based interventions. Future steps include co-designing a virtual workshop for families on common orthopedic injuries, analyzing survey data, and sharing findings with community partners to implement actionable changes.

Grant Primer, BA
Grant Primer (Rush); Russell Whitehead, MD (Rush); Muhammed R. Bux (Rush); Yi Gao (Rush); Joshua Sevier, AuD (Rush); Elias Michaelides, MD (Rush)

EQUITY IN COCHLEAR IMPLANT OUTCOMES: DOES RACE AND ETHNICITY IMPACT POST-IMPLANT SPEECH RECOGNITION PERFORMANCE?

INTRODUCTION: Racial and ethnic disparities in healthcare access and outcomes are well documented, yet their influence on cochlear implant (CI) performance remains underexplored. This study investigated whether race or ethnicity is associated with post-implant speech recognition outcomes in CI patients.

METHODS: A retrospective review was conducted of 219 adult and pediatric CI recipients at a single tertiary academic center (2012-2024). Demographic variables, including self-reported race, ethnicity, and sex, were analyzed alongside post-implant speech recognition outcomes: AzBio sentence scores, Consonant-Nucleus-Consonant (CNC) phoneme scores, and CNC word scores. Patients were grouped as White vs. non-White and Hispanic/Latino vs. non-Hispanic/Latino. Between-group differences were assessed using independent t-tests and Wilcoxon rank-sum tests. Multivariable linear regression models adjusted for age, sex, body mass index, tobacco use, substance use, number of follow-up visits, and years of hearing loss prior to implantation.

RESULTS: Among patients with complete data (n=110 for AzBio; n=60 for CNC), no statistically significant differences were observed in post-implant speech recognition improvement between White and non-White patients for AzBio (p=0.758), CNC phonemes (p=0.228), or CNC words (p=0.309). Additionally, there were no statistically significant differences between Hispanic/Latino and non-Hispanic/Latino groups for AzBio (p=0.653), CNC phonemes (p=0.873), or CNC words (p=0.751). Multivariable linear regression revealed no significant associations between race or ethnicity and any speech recognition outcome.

CONCLUSION: In this study, race and ethnicity were not significantly associated with post-implant speech recognition outcomes. While these findings may indicate equitable CI performance across demographic groups, this study was limited by a smaller sample size and other possible unmeasured variables. Future studies should incorporate larger, multicenter cohorts and more granular social determinants of health to better characterize and address potential disparities in post-implant performance.

Abstract/Poster #: 124
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

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DOOR-TO-NEEDLE TIME FOR TENECTEPLASE IN ACUTE ISCHEMIC STROKE. IMPACT OF LIMITED ENGLISH PROFICIENCY AND INTERPRETER MODALITY. RETROSPECTIVE CHART REVIEW AT RUSH UNIVERSITY MEDICAL CENTER.

INTRODUCTION: Rapid administration of intravenous thrombolysis is critical in acute ischemic stroke (AIS), with national benchmarks emphasizing door-to-needle (DTN) ≤60 minutes and high-performance goals of ≤45 minutes. Delays are associated with worse outcomes. Patients with limited English proficiency (LEP) may be disproportionately affected due to challenges determining last-known-well time, obtaining history, reviewing contraindications, and communicating risks. Prior studies suggest disparities in stroke care for LEP populations; however, few have evaluated the impact of LEP on tenecteplase (TNK) workflows. The influence of interpreter modality and time-to-interpreter connection on DTN remains underexplored. This study evaluates language-related disparities in thrombolysis delivery at a comprehensive stroke center.

METHODS: This retrospective cohort study will include adults (≥18 years) presenting to the Rush University Medical Center Emergency Department between January 1, 2022, and December 31, 2025, with AIS who received TNK within 4.5 hours of last-known-well. LEP status will be determined using preferred-language documentation and interpreter logs. Primary outcome: DTN (minutes). Secondary outcomes: Proportion meeting DTN ≤60 and ≤45 minutes; door-to-NIHSS, door-to-CT start/read, CT-to-needle intervals; and symptomatic intracranial hemorrhage ≤36 hours, inpatient mortality, discharge disposition, and discharge modified Rankin Scale. Unadjusted comparisons will use t-test/Wilcoxon rank-sum and χ^2/Fisher. Multivariable linear regression will assess DTN, and logistic regression will evaluate benchmark attainment, adjusting for age, race/ethnicity, NIHSS, premorbid mRS, blood glucose, systolic pressure, anticoagulation, EMS prenotification, arrival mode, transfer status, time of day, weekend, and aphasia. LEP-only analyses will evaluate interpreter modality (in-person, video, phone) and time-to-connection.

RESULTS: Feasibility counts confirm an adequate cohort of TNK-treated AIS patients and complete interpreter logs. Analyses will compare DTN in LEP vs English-proficient (EP) patients, identify workflow intervals associated with delay, and evaluate whether interpreter modality or faster connection improves DTN.

CONCLUSION: This study will assess whether LEP is associated with longer DTN and reduced likelihood of meeting benchmarks, and whether interpreter logistics modify these associations. Findings may identify modifiable workflow barriers and improve equitable, timely stroke care.

Abstract/Poster #: 125
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

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CHARACTERIZING EYE DROP NONADHERENCE IN PATIENTS WITH GLAUCOMA AND DRY EYE DISEASE

INTRODUCTION: Eye drop nonadherence in glaucoma and chronic dry eye disease (DED) contributes to preventable disease progression and reduced quality of life, yet patient-centered qualitative data on adherence barriers remain limited. This study intends to explore patient experiences, perceived barriers and facilitators to eye drop use, and differences between prescription, lubricant, and overlapping groups. We further examine how demographic and clinical characteristics relate to adherence-related behaviors.

METHODS: This mixed-methods study is actively recruiting 50 adults with glaucoma, DED, or both from an academic ophthalmology clinic at our institution. Eligible participants must have had their diagnosis and used prescription and/or lubricating eye drops for ≥6 months. Demographic and clinical data (e.g., medication regimen, comorbidities, and self-reported adherence) are collected via REDCap prior to 30-45-minute in-person or virtual semi-structured interviews. Transcripts are then analyzed in Dedoose using our expert-approved qualitative codebook, from which statistical analyses will be generated with thematic saturation determining representative sample adequacy. Subgroup comparisons will evaluate differences among prescription-only, lubricant-only, and overlapping users.

RESULTS: Primary outcomes include qualitative themes describing physical, cognitive, psychological, and socioeconomic factors affecting adherence, such as difficulty with instillation, forgetfulness, cost/coverage, side effects, health literacy, and perceived disease severity. Secondary outcomes include relationships between adherence patterns and age, comorbidities, and symptom burden. Comparative analyses will evaluate whether prescription-only users exhibit lower adherence than lubricant-only users and whether overlapping users experience the greatest barriers. Patient-reported preferences for eye drop assistive device features (e.g., grip design, drop control, bottle compatibility) will also be characterized where applicable.

CONCLUSION: This study is expected to provide a comprehensive, patient-centered understanding of the multifactorial drivers of nonadherence in glaucoma and DED. Findings will guide the development of targeted counseling strategies, inform design priorities for eye drop assistive devices, and support patient-centered approaches to improving long-term adherence.

Abstract/Poster #: 126
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

Allison Serrano, BS
Chizelum Ikedi, BS

CERVICAL CANCER KNOWLEDGE OF CHICAGO'S WEST AND SOUTH SIDE COMMUNITIES

INTRODUCTION: Cervical cancer continues to be a significant public health concern in the United States, especially true in underserved urban communities where healthcare access, preventive services, and health education is limited. Evaluating cervical cancer knowledge gaps across neighborhoods may help guide the ongoing effort to decrease cancer disparities within different communities. The objective of our study was to assess the understanding of cervical cancer, including its associated risks, and identify if there is a difference in knowledge levels between the West and South sides of Chicago.

METHODS: We utilized cross-sectional data from Equal Hope's Bridging the Gap in Gynecological Care survey (IRB #24081602). Data was collected from November 2024 - February 2025 in communities where cervical cancer mortality rates are high but not limited to those. 386 total surveys were completed. The analysis included 348 respondents, all of whom had complete responses for cervical cancer screening history questions. Descriptive analyses with stratification by West vs South sides were conducted, and overall percentages were reported.

RESULTS: Of 348 surveys analyzed, most respondents from Chicago's West and South sides had heard of the Illinois Breast and Cervical Cancer Program that offers free mammograms, breast exams, pelvic exams, and Pap tests but most were unfamiliar with HPV self-collection. For recommended cervical cancer screening intervals, most West side respondents selected every 3 years, while South side respondents selected yearly. 57% of West side respondents correctly identified HPV infection as a cervical cancer risk factor, compared to 40% of South side respondents. West side respondents, more likely than South side, selected family history as a risk factor (46% vs. 29%). Most respondents from both sides did not select HIV or STDs/STIs, multiple sexual partners, and early sexual initiation as risk factors.

CONCLUSION: Large gaps in knowledge of cervical cancer risk factors are present in both South and West side communities of Chicago but are more prominent in South side respondents. This may reflect a more significant lack of resources located on the South side, however, overall emphasizes a need for more efforts to inform women about cervical cancer risks, screening, and resources in both West and South side communities.

Abstract/Poster #: 127
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Ashley Tate, BS
Ashley Tate, BS (RMC), Maya Mikos, BS (RMC), Nicholas Pizzo, BS (RMC), Truman Steele (RMC), Daniel Lugar, MD (RUMC)

RACIAL DIFFERENCES IN STATIN USE AMONG FOOD-INSECURE ADULTS WITH ELEVATED ASCVD RISK

INTRODUCTION: Cardiovascular disease (CVD) remains the leading cause of death in the United States, with food insecurity contributing to elevated atherosclerotic cardiovascular disease (ASCVD) risk. Current guidelines recommend statin therapy for adults aged 40-75 years with LDL-C ≥70 mg/dL and a 10-year ASCVD risk ≥7.5%, and for adults with diabetes or LDL-C ≥190 mg/dL, regardless of calculated risk. Despite these standards, racial disparities persist. Black and Hispanic individuals are less likely to receive statins than White individuals. However, racial differences in statin use within food-insecure populations remain underexplored. This study aims to examine whether statin use differs by race among food-insecure adults with elevated ASCVD risk.

METHODS: The Cardiometabolic Health Initiative (CHI) is a student-run mobile clinic that partners with food pantries across West Chicago to deliver CVD screenings to food-insecure populations. Among 217 participants meeting guideline criteria for statin initiation, statin use (yes/no) was compared across racial groups. A chi-square test assessed the association between race and statin use, and Cramer's V measured effect size. Analysis was restricted to participants self-identifying as White, Black/African American, or Hispanic/Latino due to small counts in other groups. This study was approved by the Institutional Review Board, and all participants provided informed consent.

RESULTS: Among the 217 eligible participants (126 Black/African American, 81 Hispanic/Latino, 10 White), statin use was suboptimal across all groups. Uptake was highest among White participants (40.0%), followed by Black participants (30.9%), and Hispanic/Latino participants (19.8%). Chi-square testing showed no significant association between race and statin use ($\chi^2 = 4.72$, df = 2, $p = 0.094$), with a small effect size (Cramer's V = 0.144), indicating minimal racial differences and overall low use.

CONCLUSIONS: Statin use did not differ significantly by race, though observed differences suggest potential disparities limited by sample size. Persistently low uptake across all racial groups underscores a broader gap in preventive cardiometabolic care among food-insecure adults. Target efforts addressing structural barriers, such as primary care access and resource limitations, are needed to improve statin initiation and reduce CVD burden in these populations.

Abstract/Poster #: 128
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Jessica Toledo, MS
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BRIDGING THE GAP: TELEHEALTH AS A TOOL TO EXPAND RURAL SPECIALTY CARE IN THE DOMINICAN REPUBLIC

INTRODUCTION: Rural communities in the Dominican Republic (DR) continue to face major barriers to specialty care despite improvements in primary care access. Telehealth offers a sustainable way to address challenges related to cost, distance, and limited specialist availability. This study evaluated patient and provider needs in Peralta, a rural municipality in Azua province, and used these findings to guide the development of a telehealth program connecting communities with specialists at Rush University Medical Center. Program goals included expanding access to specialty consultations, improving efficiency of surgical service trips through pre-screening, and assessing telehealth's impact on care quality to support sustainable long-term implementation.

METHODS: Two surveys were used to assess telehealth use and physician perspectives on the pre-operative consultation service. For each surgical trip, pre-trip telehealth consultations were conducted and documented to organize patient needs and scheduling. After each trip, the lead physician completed a post-trip survey evaluating how telehealth influenced care planning, perceived benefits and challenges, surgical outcomes, and follow-up rates. Findings informed ongoing protocol refinement.

RESULTS: Across surgical trips in 2024-2025, 88 patients received pre-trip telehealth evaluations, with 57 identified for follow-up. Consultation forms captured encounters across ENT, orthopedics, plastic surgery, gynecology, and other surgical needs. Provider post-trip surveys (n=10) showed high usability, with all clinicians rating their likelihood of future telehealth use as 5/5. Providers reported improved preparedness, more efficient case organization, and clearer identification of required pre-trip imaging and documentation. Feedback emphasized the need for more consistent patient records to further streamline workflow.

CONCLUSION: Post-trip survey responses showed that telehealth improved trip efficiency, provider preparedness, and overall workflow, with unanimous support for ongoing integration. The 64% follow-up rate highlighted persistent challenges, like difficulty contacting patients, limited surgical capacity, and inconsistent on-site patient presentation. Study limitations included the absence of patient-reported feedback, potential recall bias, a small provider sample, and incomplete insight into on-site barriers. Despite these constraints, the program demonstrated clear benefits: improved pre-trip organization, more targeted surgical planning, reduced on-site evaluation time, and better acquisition of necessary imaging. These findings support telehealth as a promising, scalable approach to expanding specialty care access in rural DR communities.

Abstract/Poster #: 129
Session: Oral Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

Kaveh Torabian, MS
Kaveh Torabian (Rush); Troy Amen (HSS); Omar Shareef (HSS); Mitchell Johnson (HSS); Adriana Liimaka (Harvard); Daniel Osei (HSS)

EVOLVING TRENDS IN COMMON HAND PROCEDURE UTILIZATION: HOW THE USE OF AMBULATORY SURGICAL CENTERS HAVE IMPACTED DISPARITIES IN CARE

INTRODUCTION: Disparities within the field of hand surgery have been extensively described, however, little is known regarding how these disparities have evolved alongside the growth of free-standing ambulatory surgical centers (ASCs). This study sought to examine utilization trends for four common hand procedures, including open and endoscopic carpal tunnel release, distal radius open reduction and internal fixation, and trigger finger release, and provide a nuanced breakdown of where disparities in the hand surgery delivery model may be arising.

METHODS: A retrospective review was conducted using the Healthcare Cost and Utilization Project New York State Ambulatory Database from 2015-2022. Differences in utilization rates for four hand procedures were assessed and trended over time by race/ethnicity for both hospital-based outpatient departments (HOPDs) and ASCs. Poisson and logistic regressions were used to evaluate the utilization rates for these procedures and their associations with various demographic variables.

RESULTS: Black, Hispanic, and Asian/Pacific Islander patients were less likely to undergo all four common hand procedures at both ASCs and HOPDs compared to White patients ($p<0.001$). Similarly, patients with Medicaid insurance and those from lower socioeconomic backgrounds were significantly less likely to be treated at ASCs compared to privately insured and higher-income patients, respectively ($p<0.001$). Encouragingly, disparities in utilization rates decreased among both Black and Hispanic patients for several procedures in HOPDs ($p<0.05$ for all). However, these improvements were not reflected in ASCs, where disparities in utilization remained unchanged over the study period.

CONCLUSIONS: Despite identifying differences in ASC and HOPD utilization among Black, Hispanic, and Asian patients, there were several encouraging trends that suggested these disparities are improving, particularly in HOPDs. These improvements, however, should be considered alongside persistent variability in access to ASCs for minorities, patients with Medicare and Medicaid insurance, and those of lower socioeconomic status. As the use of ASCs for hand surgery continues to grow, surgeons should explore strategies and healthcare policies that expand access to these high-volume surgical centers for minority patients and individuals from lower socioeconomic backgrounds. This may help improve disproportionately higher patient costs incurred between facility types and overall access to surgical care for these patients.

Abstract/Poster #: 130
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M3

Alicia Wang, BS
Alicia Wang B.S., Tom Song B.S., Tanya Sorrell, PhD, PMHNP-BC, Sophia Peng MD-FASAM

BRIDGING THE GAP: EXPANDING MOUD ACCESS IN CHICAGOLAND EMERGENCY DEPARTMENTS

INTRODUCTION: EDs are critical access points for medications for opioid use disorder (MOUD), particularly amid the fentanyl crisis. Patients presenting after nonfatal overdoses face a 5.5% one-year mortality rate(1). ED-initiated buprenorphine reduces overdose risk and improves treatment engagement (2), yet 95% of Chicagoland EDs lack a MOUD protocol and over half lack naloxone protocols(3). In response, the Illinois State Opioid Action Plan partnered with Rush University's SUD-COE to launch the Chicago Bridge program, expanding MOUD capacity in community EDs.

METHODS: We identified 33 Chicagoland EDs (40% community, 60% university/university-affiliated [UUA]) serving communities with high overdose rates (4). From 2021-2024, we contacted ED leadership and MOUD champions to assess naloxone use, MOUD protocols, addiction consults, and withdrawal management. Interested sites received staff training, EMR integration, CME-accredited education (Project ECHO), linkage to care, and funding guidance.

RESULTS: Twenty-one EDs (64%) responded, evenly split between community and UUA sites. Overall, 71% provided naloxone at discharge and 84% had at least one addiction service (23% MOUD, 56% consults, 25% withdrawal management). Among UUAs, 55-60% offered MOUD and 64-70% consults; among community EDs, 20% had MOUD, 20% consults, and 60% detox services. Four of six EDs without naloxone protocols enrolled in state distribution programs. Of 16 EDs without MOUD, three successfully implemented protocols within one year.

CONCLUSION: ED-MOUD remains underutilized, especially in community hospitals that rely on detoxification, which conflicts with evidence-based care. Key barriers include stigma, lack of training, limited institutional buy-in, and funding constraints. Institutional champions and targeted support are critical for MOUD adoption, highlighting missed opportunities for early intervention in EDs. Expanding MOUD requires academic detailing, best practice models, and sustainable funding. Scaling the Chicago Bridge model could normalize ED-MOUD as standard of care and improve equitable access to treatment for high-risk populations.

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Abstract/Poster #: 131
Session: Poster Presentation
Theme: Health Equity and Community Engagement
Trainee Rank: RMC: M2

Emily Zeng, BA
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COVERAGE ACROSS BORDERS: REGIONAL INSURANCE DISPARITIES IN THE COMPLEX ABORTION REGIONAL LINE FOR ACCESS (CARLA)

INTRODUCTION: Since Dobbs v. Jackson (2022), several states have instituted abortion restrictions and/or bans, making abortion access more difficult. Clinic closures increased travel burdens and strained remaining providers in protected states. Illinois saw the largest rise in abortion services nationwide.1-4 Four academic medical hospitals and the Chicago Abortion Fund launched the Complex Abortion Regional Line for Access (CARLA) in 2023, providing referrals and navigation for patients with complex needs requiring hospital-based abortion care. This study assesses the utilization of CARLA across states.

METHODS: A retrospective chart review (N = 1,161) was conducted from January 2023 to July 2025, with data including residency state and insurance status. 1,070 had completed intakes, and 1,055 had residency state information. Chi-Squared Tests were used to compare insurance status to in-state (IS) vs. out-of-state (OOS) residencies (n = 1,055) and U.S. Census regions (n = 1,070; Northeast, Midwest, South, West).

RESULTS: Insurance coverage for 1,070 patients consisted of Medicaid (810), which was further categorized into Illinois (551) and out-of-state Medicaid (257), commercial insurance (154), other coverage (21), uninsured (77), and unknown statuses (7). Among 1,055 patients with known residence, IS patients were significantly more likely to be insured (n = 639; 99.1%) than OOS patients (n = 416; 83.2%) (p = 1.77E-22). Insurance status also significantly varied by U.S. region (p = 4.90E-18), with the South and West having higher-than-expected rates of uninsured patients.

CONCLUSION: Regional disparities in insurance coverage for hospital-based abortion care reflect broader systemic inequities in access across states. Patients traveling from the South and West are more likely to be uninsured, increasing barriers to timely, specialized healthcare. These findings highlight the need for strengthened patient navigation systems and targeted financial assistance, such as that provided by CARLA, to reduce access delays and improve equity in post-Dobbs abortion care.

Abstract/Poster #: 132
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: M3

Anam Adil, BS
Bethany E. Perez White, PhD (Rush) Madalyne Juarez, BS (Rush)

UNCOVERING INFLAMMATORY PATHWAYS LINKED TO EPHA2 DYSREGULATION IN SKIN

INTRODUCTION: Inflammatory skin diseases are characterized by a defect in terminal differentiation and loss of skin barrier integrity. Our work shows that receptor tyrosine kinase (RTK) signaling networks, including EPHA2 and cognate ephrin-A ligands, are critical for skin barrier function. We find that EPHA2 signaling is deviated in patients with inflammatory skin diseases, such as atopic dermatitis, due to a loss of ephrin-A. However, mechanistic links between this RTK/ligand and inflammatory signaling in skin are unknown. To address this knowledge gap, we employed discovery approaches to understand how EPHA2/ephrin-A may be integrated into inflammatory pathways through protein interactions that drive inflammatory signaling and cytokine modulation.

METHODS: In our first approach, we employed unbiased, proximity-based biotin ligase proteomics in terminally differentiated human skin organoids comprised of primary keratinocytes to query EPHA2-interacting proteins in non-inflamed skin. In addition, we applied media from human skin organ cultures under i) non-inflamed conditions, ii) atopic dermatitis-like inflammatory conditions (AD-like), and iii) AD-like plus treatment with exogenous ephrin-A ligand to proteome profiler arrays to understand changes in cytokine secretion.

RESULTS: Proteomics uncovered potential EPHA2-interacting candidates with established roles in inflammation. This included proteins involved in the JAK/STAT signaling pathway, an essential pro-inflammatory mechanism upregulated in atopic dermatitis. Of specific interest was the identification of peptide spectral matches to STAT1, STAT3, STAM, STAM2, and STAP2, which are directly involved in JAK/STAT signaling. Validation of these potential EPHA2 interactors by native co-immunoprecipitation is underway. Our orthogonal approach to understand changes in secreted factors revealed that treating the AD-like organ cultures with ephrin-A ligand counteracts the increased inflammatory and proliferative factors in the AD-like group. There is an increase in the anti-inflammatory interleukin-11 and a decrease of pro-inflammatory interleukin-17A with ephrin-A treatment. Likewise, ephrin-A treatment decreases positive mediators of proliferation, including EGF, FGF7, and SDF1α while increasing anti-proliferative factors BDNF and CD40 ligand.

CONCLUSION: Our discovery approach shows potential direct participation of EPHA2 in JAK/STAT signaling. Further, we find that ephrin-A ligand treatment shifts cytokine secretion towards an anti-inflammatory and anti-proliferative state. This work provides previously unrecognized insight into crosstalk between the EPHA2/ephrin-A signaling axis and inflammation in skin.

Jekzaly Arellano, BSc MLS(ASCP)CM
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PLASMA IgG ANTIBODIES FROM neuroCOVID DONORS EXHIBIT ENHANCED INFLAMMATORY GLYCOSYLATION, AUTOREACTIVITY TO NEURONS AND GLIAL CELLS, AND INTERNALIZATION INDICATIVE OF PATHOGENIC AUTOREACTIVE ANTIBODIES

INTRODUCTION: Post-Acute COVID-19 syndrome (PACS) is linked to neurological symptoms and cognitive dysfunction (neuroCOVID), although the mechanism of which remains unclear. We characterized and assessed the role of IgG antibodies in neuroCOVID.

METHODS: We used plasma from a well-defined cohort of neuroCOVID donors (n=41) or healthy donors (n=10, pre- COVID-19 pandemic) to define IgG glycosylation pattern indicative of inflammatory IgGs and brain autoreactivity using ex vivo indirect immunofluorescence on C57BL/6 mouse brains.

RESULTS: We report that neuroCOVID IgGs exhibited a significant decrease in galactose compared to healthy controls, suggesting an inflammatory phenotype. Six out of the 41 neuroCOVID plasma IgGs were brain autoreactive. In vitro, these autoantibodies were internalized by human IPSC-derived astrocytes and neurons, which were blocked by CD32. Human iPSC-derived astrocytes treated with brain autoantibodies caused a decrease in MEGF10 mRNA, a key phagocytosis receptor.

CONCLUSION: Together, these studies demonstrate that IgGs in neuroCOVID are inflammatory and enriched in autoantibodies that may alter resident brain cell function, including potential reduced astrocytic capacity for neuronal pruning.

Abstract/Poster #: 134
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: DTS

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TARGETING APICOMPLEXAN PARASITES: FUNCTIONAL & STRUCTURAL CHARACTERIZATION OF CRYPTOSPORIDIUM THIOREDOXIN REDUCTASE AS A NOVEL DRUG TARGET

INTRODUCTION: Cryptosporidiosis is a global human infection that causes watery diarrhea, acute gastroenteritis, abdominal pain, dehydration, and nutritional disorders. Although it is usually self-limited in immunocompetent individuals, cryptosporidiosis has a deep impact on public health due to its strong relation to early childhood mortality and is also a potentially life-threatening complication in individuals with weakened immune systems. Cryptosporidium spp. are the causative agents of cryptosporidiosis, with Cryptosporidium parvum and Cryptosporidium hominis being responsible for ~90% of human infections. There are no fully effective treatments currently available, and the only FDA-approved drug, nitazoxanide, is effective in only immunocompetent patients. New drug development is challenging due to the lack of efficient Cryptosporidium in vitro systems and animal models able to validate in vivo the efficacy of pharmacological treatment. The thioredoxin/thioredoxin reductase (Trx/TrxR) system is the main antioxidant defense for C. parvum, as genomic data indicates a lack of a glutathione reductase gene in this parasite. This suggests that the Trx-based redox system can be considered a choke point. Given the central role of CpTrxR in the parasite's redox homeostasis, we focus on its functional and structural characterization using two distinct protein sequences ("F102" & "S102").

METHODS: Functional enzyme characterization / Structural studies of recombinant CpTrxR

RESULTS: In this study, we reveal a critical difference in redox metabolism between Cryptosporidium parvum and humans, in which the parasite's redox system is entirely dependent on its thioredoxin reductase in the absence of glutathione reductase. Auranofin, a gold-containing compound, is known to kill parasites in culture, and here we demonstrate that CpTrxR is irreversibly inhibited by this compound. This underscores the potential of CpTrxR inhibition as a powerful strategy for therapeutic intervention. Results comparing CpTrxR variants found F102 to be more stable, with a higher melting temperature and increased activity over time. We present the crystallographic structures of CpTrxR to provide a visualization of three catalytically competent conformations of the C-terminal tail in "in" conformations, unveiling new aspects of the enzyme's mechanism.

CONCLUSIONS: These findings offer essential structural and biochemical insights for the design of selective inhibitors, highlighting Cryptosporidium TrxR as a prime target for drug development.

Abstract/Poster #: 135
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: Post-Doctoral Research Fellow

Stefanie Cassoday, PhD
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CHARACTERIZING ANTI-HIV IGG DISTRIBUTION AND NEUTRALIZATION POTENTIAL IN AN HIV-INFECTED CEREBRAL BRAIN ORGANOID MODEL

INTRODUCTION: The pathophysiology of HIV-associated neurocognitive disorder stems from early CNS invasion by HIV, establishing viral reservoirs, chronic neuroinflammation, and limited cART penetrance. Building on our recent work establishing replication-competent HIV infection in microglia-containing cerebral organoids, we sought to determine whether and how VRC01, a broadly neutralizing anti-HIV antibody, could reduce infection of cerebral organoids over time.

METHODS: Microglia containing cerebral organoids were generated using inducible pluripotent stem cells(iPSC) and hematopoietic stem cells (HSC) and matured for 60 days. To assess IgG diffusion, Gamunex-C (pooled human IgG; 50 or 200 µg/mL) was labeled with Cy-3 and added to organoids alongside a no-Gamunex-C control. After 24 or 72 hours, organoids were fixed in 4% PFA, cleared using the Optimized Single-step optical clearing solution, imaged using a spinning disc confocal microscope, and Cy-3 MFI was quantified using ImageJ. In a separate experiment, organoids were assigned to control (no virus), HIV-infected, HIV preincubated with VRC01 (50 µg/mL) 30 min before exposure (pretreatment), or VRC01 added after 3-day infection and at each supernatant collection (post-treatment). All HIV-infected groups were exposed to 7ng of HIV, washed after 3 days, and given fresh media, then supernatant was collected on days 1, 3, and 5 following this infection period for p24 ELISA analysis.

RESULTS: Gamunex-C penetrated organoids in all conditions, with diffusion increasing in a dose- and time-dependent manner. The greatest level of IgG penetrance was observed in the 200 µg/mL, 72-hour group, which showed the highest MFI throughout the organoid interior. Analysis of p24 revealed distinct infection profiles across treatment groups. Both the control and pretreatment groups exhibited no detectable p24 production. The HIV-infected group showed limited but measurable infection in 1 organoid, while the post-treatment group displayed the highest levels of p24, with concentrations potentially plateauing by day 5, indicating VRC01 was unable to inhibit infection.

CONCLUSION: These findings demonstrate that IgG does diffuse into cerebral organoids, with maximal penetrance achieved at higher concentrations and longer exposure times. Additionally, VRC01 prevented HIV infection with pretreatment, whereas post-treatment exacerbated infection, potentially through FC engagement-mediated neuroinflammation, highlighting the importance of treatment timing for limiting CNS HIV replication.

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LITHIUMH CHLORIDE AS A MODULATOR OF MITOCHONDRIAL DYSFUNCTION IN THE CONTEXT OF ART

INTRODUCTION: People living with HIV (PLWH) are living longer with effective antiretroviral therapy (ART), yet they continue to experience elevated rates of non-AIDS comorbidities strongly linked to mitochondrial dysfunction. Identifying strategies to counteract ART-associated mitochondrial injury is therefore an important priority for improving long-term health outcomes in this population. Lithium chloride (LiCl) has emerged in prior studies as a potential modulator of cellular stress responses and mitochondrial homeostasis, but its ability to mitigate ART-induced dysfunction remains incompletely defined.

METHODS: To examine this possibility, peripheral blood mononuclear cells (PBMCs) from healthy donors were exposed to ART with or without LiCl for short and longer-term intervals. Mitochondrial function was assessed through measures of cellular respiration, mitochondrial content, oxidative stress, and mitochondrial genome integrity.

RESULTS: Cells exposed to ART alone, specifically to plasma-equivalent concentrations of bictegravir (BIC; 6.15 µg/mL), tenofovir alafenamide (TAF; 0.121 µg/mL), emtricitabine (FTC; 2.13 µg/mL) which together comprise Biktarvy, as well as efavirenz (EFV), exhibited reduced respiratory capacity. In contrast, cells treated with these same ART agents in the presence of LiCl showed improved mitochondrial respiration, indicating a partial restoration of mitochondrial function. Molecular analyses further suggested shifts in mitochondrial genome abundance and stress-response signaling consistent with a protective or compensatory effect.

CONCLUSION: Together, these findings provide compelling preliminary evidence that LiCl can counteract ART-induced mitochondrial dysfunction in immune cells. With further validation in physiologically relevant models and in PLWH, LiCl or related mitochondrial modulators could emerge as a viable therapeutic strategy to lessen mitochondrial-driven comorbidities and improve long-term health outcomes in the ART-treated population.

Abstract/Poster #: 137
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: DTS

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CLINICALLY RELEVANT ART REDUCES OSTOCLAST METABOLIC RESERVE AND BONE RESORPTIVE FUNCTION

INTRODUCTION: Approximately 40 million people worldwide are living with human immunodeficiency virus (HIV), according to the World Health Organization. Although antiretroviral therapy (ART) effectively suppresses viral replication, people living with HIV (PLWH) remain at elevated risk for age-related comorbidities compared to the general population. Emerging evidence indicates that ART itself can contribute to cellular stress and toxicity across multiple immune and stromal cell types, including those of myeloid lineage. Monocytes, which give rise to macrophages, dendritic cells, and osteoclasts, play essential roles in immune function and tissue homeostasis. Under inflammatory conditions or during tissue remodeling, monocytes differentiate into osteoclasts, the primary bone-resorbing cells. While HIV infection has been shown to alter osteoclast function, the effects of clinically relevant ART regimens on osteoclast differentiation and metabolic capacity remain poorly defined. Understanding how ART shapes osteoclast biology may clarify mechanisms underlying the increased burden of osteoporosis observed in aging PLWH.

METHODS: To evaluate the impact of ART on osteoclasts primary monocytes were isolated from healthy donors and differentiated toward osteoclasts in the presence of plasma-equivalent concentrations of Bictegravir (BIC, 6.15 µg/mL), Tenofovir Alafenamide (TAF, 0.121 µg/mL), and Emtricitabine (FTC, 2.13 µg/mL), individually or in combination as the fixed-dose regimen Biktarvy for 48hrs. Osteoclast maturation, bone resorptive capacity, and mitochondrial function were assessed using immunofluorescence microscopy, toluidine blue pit assays, and Seahorse mitochondrial stress testing.

RESULTS: ART exposure impaired multiple aspects of osteoclast differentiation and metabolism. Spare respiratory capacity was significantly reduced by both TAF ($p = 0.0266$) and Biktarvy ($p = 0.0250$) relative to vehicle. Biktarvy also significantly decreased maximal respiration ($p = 0.0386$). Immunofluorescence revealed morphological features consistent with impaired maturation, including a reduction in cells containing three or more nuclei in the TAF-treated group. Functionally, TAF-treated osteoclasts displayed diminished resorptive activity on bone-mimetic substrates.

CONCLUSION: This study aims to investigate the impact of clinically relevant ART on the function of monocyte-derived osteoclasts and their potential role in osteoporosis. Our findings suggest that Biktarvy has pronounced morphological and physiological effects on osteoclasts, potentially driven by TAF, that leads to deficits in maturation, resorption, and metabolism.

Abstract/Poster #: 138
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: Post-Doctoral Research Fellow

Tania Gomez, PhD
Author(s)/Co-Authors: Gómez-Sierra Tania, Molina-Jijón Eduardo, Pamela Guevara-Zavala, Clement Lionel, Macé Camille Affiliation/Institution: Glomerular Disease Therapeutics Laboratory, Department of Internal Medicine, Rush University Medical Center, Chicago, Illinois, USA.

IMPACT OF IL4Rα RELEASED DURING COVID-19 RESPIRATORY INFECTION ON PRE-EXISTING FOCAL SEGMENTAL GLOMERULOSCLEROSIS AND DIABETIC NEPHROPATHY

INTRODUCTION: Glomerular disease focal segmental glomerulosclerosis (FSGS) and diabetic nephropathy (DN) can be exacerbated under cytokine storm conditions. We studied the impact of IL4Rα in the worsening of FSGS and DN induced by COVID-19 like cytokine storm.

METHODS: FSGS model: 7.5 mg/kg body weight and 8.5 mg/kg body weight of Adriamycin were injected retro-orbitally into male mice il4Rα -/- and control Balb/cJ (10 per group) at 11-week-old to induce FSGS. Survival was recorded and body weight, serum creatinine, and albuminuria were analyzed up to 49 days. DN model: 10-week-old male db/db il4α+/+ and db/db il4Rα -/- mice (5 per group) were injected retro-orbitally with cytokine cocktail D (dose 1.8X). Serum creatinine and albuminuria were analyzed up to 14 days.

RESULTS: FSGS model: In the 8.5 mg group, peak albuminuria at Day 10 was significantly higher in il4rα-/- mice compared to Balbc/J mice. In the 7.5 mg group, peak albuminuria was noted at Day 15 and there was no significant difference between il4rα-/- mice and Balbc/J mice. When injected with 7.5 mg/kg body weight, mice had a slight increase of serum creatinine. il4Rα-/- mice had significantly higher serum creatinine than Balbc/J mice when injected with 8.5 mg in the established phase of FSGS. Furthermore, creatinine was persistently elevated in il4Rα-/- mice. DN model: Creatinine increased significantly compared to baseline in both groups.

CONCLUSIONS: We will use the dose of 8.5 mg/ kg body weight of Adriamycin for our future studies. This dose is the most suitable dose as we have elevated and persistent creatinine, dramatic increase of albuminuria and the mice are not dying too fast allowing us to study chronic kidney disease. This dose also shows that il4Rα-/- mice get more severe FSGS compared to the control mice. The injection of cocktail D 1.8X worsens kidney function by day 14. Whereas this study was terminated on Day 14, we plan to repeat this study with follow-up of up to 8 weeks to assess if chronic kidney disease (as seen on D14) persisted for a longer duration and whether there was a statistically significant difference between the two groups.

Abstract/Poster #: 139
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: DTS

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CORRELATING β-GALACTOSIDASE ACTIVITY TO IgG GALACTOSYLATION AND CYTOKINE LEVELS DURING EPISODIC VIREMIA IN PEOPLE LIVING WITH HIV ON ANTIRETROVIRAL THERAPY

INTRODUCTION: Despite effective combined antiretroviral therapy (cART), people living with HIV (PLWH) experience persistent low-grade inflammation, leading to premature aging and an elevated risk of severe comorbidities. IgG Fc glycosylation regulates antibody effector function and inflammatory activity. PLWH exhibit increased agalactosylated IgG glycans, which are changes linked to elevated inflammation markers and comorbidity severity. The mechanisms driving these glycan alterations remain unclear. In this study, we wanted to better understand the galactose modifications on IgG. Previous lab data demonstrated an inverse correlation between viral load and digalactosylated IgG fractions, which suggests that viral rebound influences galactosylation. This project aims to understand changes in bulk IgG glycosylation following episodic viremia and the relationship between episodic viremia, inflammatory cytokines, and IgG glycosylation in cART-treated PLWH.

METHODS: Utilized plasma from 19 MACS/WIHS participants on cART with documented episodic viremia (>200 copies/mL). Samples were collected at three timepoints: pre-viremia, during viremia, and post-viremia with sampling intervals between 6 months to 1 year per visit. β-galactosidase (GLB1) activity was measured using colorimetric assays optimized for plasma. Plasma cytokines levels were evaluated by Luminex assay. Data is analyzed using Pearson correlations to assess relationships between GLB1 activity, cytokines, and IgG glycan patterns.

RESULTS: We found a significant correlation between agalactosylated IgG and GLB1 activity. Additionally, we found that IFN-γ levels correlated with GLB1 activity. We did not find differences in GLB1 activity across 3 visits.

CONCLUSION: The correlations between GLB1 activity, agalactosylated IgG, and IFN-γ suggest that inflammatory cytokines and glycosylhydrolase enzymes may both influence IgG glycan remodeling during episodic viremia. Together, these results indicate that episodic viremia may have lasting effects on glycan alterations and cytokine levels that contribute to persistent immune activation in cART-treated PLWH. Future directions for this study will examine cytokine regulated glycosyltransferases, like beta-galactose, to show how inflammatory pathways alter the enzymes responsible for adding galactose to IgG.

Abstract/Poster #: 140
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: DTS

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INTERMEDIATE CD16 EXPRESSION DEFINES SUPERIOR BUT RARE ANTI-HIV NK CELLS THAT HAVE ENHANCED NKG2D-DEPENDENT DIRECT KILLING AND ADCC

INTRODUCTION: HIV affects 38 million people worldwide. Although antiretroviral therapy (ART) controls plasma viremia, it cannot eliminate latently infected cells, requiring lifelong treatment that is linked to accelerated aging, cardiovascular disease, metabolic disorders, and bone issues. Natural killer (NK) cells are highly effective at lysing HIV-infected cells and are already used in leukemia treatment to destroy cancer cells. For NK cell therapy to effectively control HIV after ART discontinuation, it is essential to determine which NK subsets and mechanisms most efficiently eliminate virus-producing cells in tissue reservoirs. Long-term elite controllers (LTEC), who maintain viral suppression without ART for more than 10 years, provide valuable insights; they have approximately four times as many CD56dimCD16dim (CD16dim) NK cells as ART progressors and uninfected individuals, while their CD56dimCD16bright (CD16bright) NK cells are decreased. We hypothesize that CD16dim NK cells are more effective at killing HIV-infected cells than CD16bright NK cells.

METHODS: We evaluated degranulation and cytolytic responses of purified CD16dim and CD16bright NK cells against autologous HIV-infected cells and examined the roles of NKG2D and ADAM-17 in direct killing and antibody-dependent cellular cytotoxicity (ADCC).

RESULTS: CD16dim NK cells exhibited 4–6 times greater cytotoxicity than CD16bright cells, despite expressing ten times less CD16. CD16dim cells degranulate through NKG2D activation—important as HIV Vpr induces NKG2D ligands on infected cells—and express 1.3–1.5 times more NKG2D. Even with lower CD16 levels, CD16dim cells mediate significantly higher ADCC, relying on both NKG2D and ADAM-17. Within one hour, two-thirds of CD16dim cells degranulated compared to fewer than one-third of CD16bright cells.

CONCLUSION: CD16dim cells complete the killing cycle more efficiently, enabling superior serial killing. Their enhanced ADCC and direct killing abilities make this subset the ideal NK cell population for therapeutic strategies aimed at eradicating HIV reservoirs after ART removal.

Abstract/Poster #: 141
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: DTS

Gabrielle Kooi, BS in Biology, MS in Integrated Biomedical Science
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M2 SKEWED MACROPHAGE SHOWS ELEVATED IGG BINDING RELATIVE TO M1: A STRATEGY TO TARGET BRAIN VIRAL RESERVOIRS

INTRODUCTION: Macrophages play a central role in immune surveillance, with M1 and M2 phenotypes exhibiting distinct roles in inflammation. M1 macrophages are classified as pro-inflammatory, while M2 macrophages are anti-inflammatory. FcγRs mediate immune functions, including antibody-dependent cytotoxicity (ADCC) and phagocytosis. In preliminary studies of SIV-infected rhesus macaques after cART cessation, M2 macrophages were elevated during cessation/rebound compared to uninfected, AIDS and cART-suppressed animals, while M1 macrophages and microglia remained unchanged. Notably, M2 were susceptible to SIV infection. This rapid shift toward an anti-inflammatory M2 state may preferentially support viral rebound, highlighting M2 macrophages as a myeloid viral reservoir.

METHODS: Humanized mice NSG (NOD.Cg-Prkdcscid Il2rgtm1Wjl/SzJ) were generated by engraftment of human PBMCs. Mice were intraperitoneally injected with Gamunex-Cy5. At 48 hours post-IP injection, the mice were perfused with PBS, and the brains were harvested. Brain sections (5µm) were stained for GFAP, F4/80, and Iba1 to assess astrocyte and myeloid association with Gamunex-Cy5 via fluorescent microscopy. PBMC-derived monocytes were differentiated into M1 (IFNγ + LPS) or M2 (IL-4) macrophages. M1 macrophages were stained with surface markers CD80 and CD86, while M2 macrophages were stained with CD206. Both populations were stained for FcγRs (CD16, CD32 and CD64) to determine phenotype-specific Gamunex-Cy5 association and preferential FcγR binding.

RESULTS: Immunofluorescent staining of sectioned brains revealed myeloid-lineage, macrophages and microglia, cells are associated with injected Gamunex-Cy5 and not with astrocytes. PBMC-derived macrophages polarized to M2 showed greater binding to IgG compared to M1. Assessment of FcγR binding to Gamunex-Cy5 showed that M2 macrophages had higher binding via CD64 engagement. Contrastingly, M1 macrophages bound Gamunex-Cy5 via engagement of CD16 and CD32.

DISCUSSION: The preferential association of IgG-Cy5 with myeloid-lineage cells suggests that antibody-based therapies may utilize these cells for trafficking into the brain. CD64 is a high-affinity activating FcγR that is upregulated during infection to promote immune complex clearance. We showed preferential expression and engagement with M2 macrophages, reflecting their enhanced immunoregulatory and tissue-repair functions. These FcγR- and phenotype-specific binding patterns highlight opportunities to design glyco-engineered IgG that selectively engage M2 macrophages to target HIV reservoirs in the brain.

Abstract/Poster #: 142
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: M3

Nicole Nowak, BS
Kevin Truong-Balderas, Paige Adams, Jennifer Westrick, Lorena Juarez, Schuyler Hilton, Yi Gao, and Kyle T Amber

FREQUENCY OF VENOUS THROMBOEMBOLISM IN IMMUNOBULLOUS DISEASE PATIENTS TREATED WITH IVIG: A SYSTEMATIC REVIEW

INTRODUCTION: Autoimmune bullous diseases (AIBD) are chronic autoimmune disorders characterized by autoantibody-mediated destruction of epithelial adhesion molecules. Prior epidemiologic studies have shown that patients with AIBD have an elevated baseline risk of venous thromboembolism (VTE). Intravenous immunoglobulin (IVIg) is an established therapeutic option for refractory disease; however, IVIg has been associated with thrombotic complications in other autoimmune and malignant conditions. The VTE risk attributable specifically to IVIg in AIBD remains poorly defined. This systematic review aimed to evaluate the frequency of VTE events in AIBD patients receiving IVIg therapy.

METHODS: This study followed a pre-registered protocol (PROSPERO CRD42024587871). A comprehensive search of MEDLINE, Embase, Scopus, and Google Scholar identified 1244 studies. After removal of duplicates and screening, 32 studies met inclusion criteria. Eligible studies included chart reviews, cohort studies, case series, clinical trials, and prospective observational studies. Extracted variables included sample size, AIBD subtype, IVIg regimen, timing of VTE onset, and type of VTE event. VTE outcomes included deep vein thrombosis (DVT) and pulmonary embolism (PE).

RESULTS: Across the included studies, 1106 AIBD patients received IVIg. Seven VTE events were reported: five DVTs and two PEs, yielding a pooled VTE frequency of 0.64% (95% CI: 0.17-1.10). VTE events occurred across multiple AIBD subtypes, including pemphigus vulgaris and bullous pemphigoid, with no subtype-specific clustering. Most IVIg regimens consisted of 2 g/kg administered over 3-5 days. Compared with IVIg-treated populations in other conditions, such as inflammatory neuropathies (2.8-11.3% VTE over 2 years) and hematologic malignancies (2-7% yearly), the VTE frequency in AIBD appears lower. However, follow-up durations were often limited or unreported, preventing true incidence estimation.

CONCLUSION: This review demonstrates a low reported frequency (0.64%) of VTE among AIBD patients treated with IVIg. Although the risk appears lower than that seen in other autoimmune and malignant diseases, under-reporting, retrospective design limitations, and lack of standardized follow-up likely underestimate the true incidence. Given that reported VTE events occurred with IVIg dose of 2 g/kg, future prospective studies should examine infusion rates, dosing patterns, and individual VTE risk factors to guide risk-mitigation strategies. Additionally, propensity-matched population studies are needed to clarify how IVIg modifies baseline VTE risk in AIBD.

Kanika Sharma, MS in Biotechnology
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HIGH-FAT DIET-INDUCED OBESITY DRIVES SEX-SPECIFIC DIFFERENT DISEASE PROFILES IN A MURINE MODEL OF PULMONARY ARTERIAL HYPERTENSION.

INTRODUCTION: Obesity (a global pandemic) is prevalent as a comorbidity in patients with pulmonary arterial hypertension (PAH) but its impact on pulmonary vascular disease remains controversial. We employed the EHITSN-KDITSN murine model of PAH, which closely recapitulates the human disease including the sex bias, to evaluate the impact of high-fat diet-induced (HFD) obesity on lung vascular remodeling, lung hemodynamics, and cardiac function in this murine model.

METHODS: Male and female EHITSN-KDITSN mice, 4 months of age, were subjected to HFD for 12-weeks. Hemodynamic measurements (RVSP and Fulton Index) were performed using right heart catheterization. Lung and heart tissues were collected, fixed, and subjected to histological analyses (Hematoxylin & Eosin, wheat germ agglutinin (WGA) Alexa Fluor 494/DAPI staining) and morphometry (Stepanizer software, NIH ImageJ), to evaluate lung vascular remodeling and RV hypertrophy.

RESULTS: After 12 weeks of HFD, both male and female EHITSN-KDITSN mice exhibited a significant increase (40% and more) in body weight compared to EHITSN-KDITSN mice on standard diet. Interestingly, we found sex-specific responses to explain the effects of obesity on PAH pathology. Specifically, HFD-EHITSN-KDITSN female and male mice displayed significant lung vascular remodeling, with greater number of vascular obliterative and plexiform lesions and greater muscularization of small (20µm- 50µm) and mid-size pulmonary arteries (50µm - 100µm) compared with the standard diet EHITSN-KDITSN mice. Hemodynamic measurements indicated higher RVSP values for both male and female obese EHITSN-KDITSN mice compared with nonobese mice with male mice showing slightly higher RVSP values compared to the female counterparts. While the HFD did not trigger significant changes in RV hypertrophy regardless of obesity and PAH background, RV hypertrophy was greater in HFD-EHITSN-KDITSN female mice vs. HFD-EHITSN-KDITSN male mice. WGA-DAPI staining to quantify histological size and number of cardiomyocytes indicated greater cardiomyocytes hypertrophic response with 30% increase in cell volume and modest 15% increased number in HFD-female EHITSN-KDITSN mice by comparison with HFD-EHITSN-KDITSN males, suggesting female mice are more prone to the effects of increased body fat mass.

CONCLUSIONS: Our studies demonstrate that HFD-induced obesity drives sex-specific different disease profiles in the pulmonary vasculature and cardiac function of a murine model of pulmonary arterial hypertension.

Abstract/Poster #: 144
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: Post-Doctoral Research Fellow

Amber Virdi, PhD
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ZOMBIE DEFECTIVE HIV PROVIRUSES LACKING NEUROTOXIC PROTEINS ELICIT INFLAMMATORY CYTOKINE AND CHEMOKINE RESPONSES IN HUMAN ASTROCYTES AND MACROPHAGES

INTRODUCTION: Despite effective antiretroviral therapy (ART), many people with HIV (PWH) continue to experience persistent central nervous system (CNS) inflammation. Nearly half of PWH experience HIV-associated neurocognitive disorders (HAND), even when viral loads are suppressed. The biological drivers of this inflammation remain poorly defined. Classical models attribute HIV-mediated neurotoxicity to viral proteins such as Tat, Nef, and Vpr-potent neurotoxins known to induce cytokine release, disrupt neuronal integrity, and alter glial function. However, >99% of proviruses in the CNS are defective and lack intact coding sequences for these neurotoxic proteins. These non-infectious "zombie" proviruses integrate, transcribe, and generate viral products capable of stimulating innate immune pathways. A key question is whether zombie proviruses still activate glial cells and contribute to persistent neuroinflammation. This study examined whether clinically-derived defective proviruses (DPVs) drive inflammatory responses in CNS-resident cells.

METHODS: Seventy-two near-full-length DPVs were isolated from brain tissue of three HIV-positive individuals. Two representative DPVs were selected: (1) a ~5.4 kb genome containing only gag and pol segments with no Tat, Nef, or Vpr, and (2) a hypermutated ~9.4 kb nearly full-length genome similarly lacking intact neurotoxin-encoding regions. Each DPV was inserted into an HIV-JRFL-based plasmid backbone retaining functional 5′ and 3′ LTRs. Lentiviral particles carrying these DPVs (DLVs) were produced using helper plasmids. Human iPSC-derived astrocytes (iAs) and monocyte-derived macrophages (MDMs) were exposed to DLVs for seven days, and viral transcript expression and cytokine induction were quantified by RT-qPCR.

RESULTS: DLV exposure resulted in detectable gag/pol transcripts in iAs, indicating LTR-driven transcription from the integrated constructs. Trichostatin-A further increased viral transcript expression. DLV-treated cells showed significant upregulation of IL-8 and TNF-α mRNAs in iAs and IL-6 and MCP-1 mRNAs in MDMs.

CONCLUSION: Brain-derived defective proviruses that lack classical HIV neurotoxins remain transcriptionally active and trigger inflammatory cascades in CNS-resident cells. Their ability to induce cytokine and chemokine responses despite lacking Tat, Nef, and Vpr challenges the prevailing paradigm that HIV neuroinflammation requires these. Instead, these findings support a model in which zombie proviruses act as persistent, inducible sources of inflammatory signaling that may contribute to HAND pathogenesis under suppressive ART.

Abstract/Poster #: 145
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: DTS

Heaven Wade, BS
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INTERMITTENT HYPOXIA MODULATES IN A SEX-SPECIFIC MANNER THE TRANSCRIPTIONAL PROFILE OF ENDOTHELIAL CELL IN PULMONARY ARTERIAL HYPERTENSION

INTRODUCTION: Pulmonary arterial hypertension (PAH) is a sex-biased disease characterized by pulmonary artery remodeling, hypoxemia, and right ventricle failure. Long-term prognosis of patients with PAH are adversely affected by comorbidities such as obstructive sleep apnea (OSA). However, the impact of intermittent hypoxia (IHx), the hallmark manifestation of OSA, on endothelial dysfunction hyperproliferation, apoptosis-resistance and central pathological changes responsible for the vascular remodeling in PAH remains elusive. Thus, we sought to investigate the contribution of IHx to the severity of pulmonary artery endothelial cells phenotype in PAH.

METHODS: Pulmonary artery endothelial cells of PAH patients (ECPAH), both sexes, isolated from the lung explants of patients with PAH and non-disease donors were subjected to IHx for 7 consecutive days in Biospherix chambers [8h during the sleep with 30 cycles/h [(1 min 3% O2 and 1 min 7% O2) and 16h 7% O2 during the wake period]. Molecular, cell biology approaches and bioinformatics (RNASeq, ChIP, quantitative RT-PCR, site-directed mutagenesis, siRNA, bisulfite sequencing, Western blotting, EdU cell proliferation and Tunel cell death) were used to analyze the effects of IHx on ECPAH phenotype.

RESULTS: The studies indicate that IHx exerts sex-specific effects on the ECPAH phenotype compared to normoxia. The expression of the long-noncoding RNA XIST and of X-linked epigenetic regulator O-linked N-acetyl-glucosamine transferase (OGT), and its pair enzyme glycoside hydrolase O-GlcNAcase (OGA) were altered. Consequently, an abnormal OGT/OGA cycling led to sex-specific increased O-glycosylation of the JunD transcription factor. At Ser27 and Thr117, two amino acid residues well-conserved in mammals, and the only ones that can be not only phosphorylated but also O-glycosylated, became transcriptionally impaired causing downregulation of anti-apoptotic proteins Bcl2 and IAP1/2 and decreased apoptosis-resistance of ECPAH. Moreover, the suppressor of cytokine signaling 1 (Socs1), a negative regulator of immune responses, was downregulated via either the transcriptional inactivation of JunD, a Socs1 regulator, or via epigenetic methylation of the Socs1 promoter involving XIST signaling network.

CONCLUSION: Our studies demonstrate that on a PAH background, IHx modulates in a sex-specific manner the transcriptional profile of ECs via XIST signaling network and the O-glycosylation of JunD and suggest potential therapeutic strategies to overcome apoptosis-resistance and mitigate ECPAH dysfunction.

Abstract/Poster #: 146
Session: Oral Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: Post-Doctoral Research Fellow

Yulu Wang, MD
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ACTIVATION OF KERATINOCYTE AUTOPHAGY IN BULLOUS PEMPHIGOID

INTRODUCTION: Bullous pemphigoid (BP) is an autoimmune blistering disorder. Autophagy is a regulated lysosomal degradation pathway essential for epidermal homeostasis, keratinocyte differentiation, stress adaptation, and immune modulation. Keratinocytes treated with IgG from BP patients (BP-IgG) have been shown to develop marked morphological accumulation of autophagosomes and lysosomes. However, the role of autophagy in the epidermis of bullous pemphigoid remains unclear.

METHODS: Skin biopsies from BP, Spongiotic dermatitis (SD), and normal skin (NL) were stained for LC3B and p62 by immunohistochemistry (IHC). Cytoplasmic and nuclear staining intensities were quantified. LC3B marks autophagosome formation, while p62 is degraded during autophagy. Statistical analysis was performed using the Mann-Whitney U test. For in vitro analysis, immortalized human keratinocytes (nTERT) were treated with affinity purified BP-IgG or IgG from healthy control for 2 hours. Immunocytochemistry (ICC) for LC3B was subsequently performed.

RESULTS: BP skin exhibited significantly increased LC3B expression ($P = 0.04$) and a trend towards decrease p62 ($P = 0.010$) compared to NL, particularly with nuclear LC3B significantly higher in BP ($p = 0.0445$). Autophagy scores were overall elevated in BP. SD showed similar trends to BP. In vitro, BP-IgG treated nTERT cells exhibited increased LC3 fluorescence intensity compared to control IgG ($P=0.0027$).

CONCLUSION: BP is associated with an epidermal autophagy signature characterized by increased LC3B and reduced p62. In vitro findings indicate that BP autoantibodies can directly induce autophagy in keratinocytes. These results support autophagy as both a marker of keratinocyte stress and a potential therapeutic target in BP.

Abstract/Poster #: 147
Session: Poster Presentation
Theme: Infectious Diseases and Inflammation
Trainee Rank: RMC: M2

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TOPICAL GAMMA-SECRETASE INHIBITION FAILS TO INDUCE COMEDOGENESIS IN THE PRESENCE OR ABSENCE OF EXOGENOUS HORMONE OR OBESITY

INTRODUCTION: Hidradenitis suppurativa (HS) is a chronic skin condition characterized by painful boils, abscesses, and scarring, with significant impact on patients' quality of life. A major obstacle to developing effective treatments for HS is the absence of an animal model that accurately captures the disease's underlying pathogenesis. Currently, studies show that follicular occlusion plays a central role in HS pathophysiology, and γ-secretase inhibition within the NOTCH/γ-secretase pathway is known to disrupt hair follicle differentiation and promote follicular plugging. Additional risk factors-including metabolic syndrome and hyperandrogenism-are also associated with increased disease severity. This study investigates whether topical application of DAPT, a γ-secretase inhibitor, alone or in combination with dexamethasone and either obesity or hyperandrogenism, could induce follicular occlusion and model the early pathogenesis of HS.

METHODS: Seven-week-old C57BL/6 mice were depilated to induce synchronous anagen. Mice in the control group received daily topical vehicle, while mice in the treatment groups were treated with daily topical DAPT for up to 12 weeks to promote prolonged catagen and follicular occlusion. Obese, insulin-resistant mice and testosterone-supplemented mice were also used in each group to model metabolic syndrome and androgen excess, respectively. Histologic evaluation was performed every three weeks to assess hair cycle stage and follicular occlusion. The primary outcome was the development of clinical or histologic comedones.

RESULTS: Across all treatment groups, topical DAPT did not induce visible or histological comedogenesis. Neither obesity nor hyperandrogenism increased susceptibility to comedone formation with topical DAPT application.

CONCLUSION: Topical inhibition of γ-secretase with DAPT did not produce follicular occlusion or comedogenesis-even under metabolic or hormonal conditions known to exacerbate HS. These findings underscore the limitation of using topical DAPT as a stand-alone strategy to induce the early follicular changes characteristic of HS. This study highlights the need for further investigation into additional pathogenic stimuli or multimodal strategies to more accurately recapitulate early disease pathology in a preclinical HS model.

Abstract/Poster #: 148
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

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SHEAR STIFFNESS OF EQUINE SYNOVIAL MEMBRANE IN OSTEOARTHRITIS AND RESPONSE TO POLYACRYLAMIDE HYDROGEL TREATMENT

INTRODUCTION: The synovial membrane plays an important role in osteoarthritis and is increasingly linked to both the development and progression of the disease. The objective of this study was to evaluate synovial membrane stiffness in a preclinical equine osteochondral fragment model of osteoarthritis, assessing the effects of intra-articular polyacrylamide hydrogel (PAAG; Arthramid Vet).

METHODS: Thirty-two synovial membrane samples were harvested from 16 horses with experimentally induced osteoarthritis (OA) in the middle carpal joint (MCJ). Horses were evenly divided into two groups of n = 8 each: OA treated with intra-articular PAAG injections, and OA treated with saline. Each horse served as its own control via contralateral sham-operated joints. Two standardized 8-mm diameter plugs were excised per sample using an Osteochondral Autograft Transfer System (OATS) punch to ensure geometric consistency. Paired control and treated samples underwent simultaneous rheological testing. Viscoelastic properties were assessed using amplitude sweeps on a rheometer equipped with an 8-mm parallel plate at controlled temperature. Each plug was compressed to 5% thickness in Tris-buffered saline to maintain hydration. Shear strain was incrementally increased from 0.1% to 100% at a frequency of 1 Hz, recording storage modulus (G') values. Statistical analysis included paired t-tests with significance set at $\alpha = 0.05$.

RESULTS: Stiffness of synovial membranes significantly increased in OA-saline samples (1824 ± 1105 Pa) compared to contralateral sham controls (1002 ± 495 Pa; $p = 0.043$). In contrast, OA-PAAG tissues (1099 ± 647 Pa) exhibited stiffness similar to their respective sham controls (1184 ± 504 Pa; $p = 0.718$), indicating no significant difference.

CONCLUSION: Synovial membranes from OA joints treated with saline exhibited significantly increased stiffness versus sham controls, consistent with pathological matrix remodeling or fibrosis. Intra-articular PAAG treatment restored tissue stiffness to baseline levels, indicating its potential therapeutic benefit in osteoarthritis.

Abstract/Poster #: 149
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

Delia Alkhatib, M.Sc. IBS
Delia O. Alkhatib, and Ryan D. Ross

LRP5 ACTIVATING MUTATIONS DO NOT INCREASE ALVEOLAR BONE MASS IN THE HYP MOUSE MODEL OF XLH.

INTRODUCTION: X-linked hypophosphatemia (XLH) results from loss-of-function mutations in the PHEX gene. It causes impaired mineralization of bones and teeth. Tooth loss is common in patients with XLH, due to defective formation and mineralization of the alveolar bone. Wnt signaling is a critical bone regulating pathway. Previous research in our lab reported that activating Wnt using an antibody to the soluble Wnt antagonist, sclerostin, increased bone formation, mass and mineralization in the Hyp mouse model of XLH. Based on these findings, we hypothesized that crossing the Hyp mouse model of XLH with the high bone mass (HBM) mouse model, which contains a mutation in low-density lipoprotein receptor-related protein 5 (LRP5), that leads to constitutive Wnt activation, causes a greater gain in bone mass in the Hyp mouse.

MATERIAL AND METHODS: Littermate male and female WT, HBM, Hyp and HypXHBM mice were generated by breeding heterozygous female mice with heterozygous HBM male mice. A comparison group of male and female WT and Hyp mice were treated with vehicle (saline) or sclerostin antibody (Scl-Ab) at a dose of 25 mg/kg twice weekly starting at 3-weeks-age. All animals were euthanized at 13-week-age and alveolar tissues were extracted for analysis with microcomputed tomography. The outcomes of interest were the bone volume fraction (BV/TV) and tissue mineral density (TMD) in the alveolar bone and distal femoral diaphysis. Mice were compared separately within each cohort using a one-way analysis of variance, followed by post-hoc t-tests.

RESULTS: Male mice of HypxHBM showed a significant improve of alveolar bone BV/TV compared to Hyp mice unlike female group. In contrast, Scl-Ab treatment increased the alveolar BV/TV in female mice, with a near significant increase in the male mice. Neither Scl-Ab, nor the HypxHBM genetic cross increased the alveolar tissue mineral density. Results suggest that LRP5 is not the primary receptor contributing to XLH pathology.

CONCLUSION: This study found a surprising discrepancy between the activation of Wnt signaling through LRP5 vs Scl-Ab. The mechanisms underlying canonical WNT signaling activation in XLH pathology remain unclear. Additional research is requisite to comprehend the function of LRPs in initiating cWNT in XLH pathology.

Abstract/Poster #: 150
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Marcos Amstalden Barros, MD
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THE IMPACT OF PECTORALIS MINOR TIGHTNESS AND SUBSEQUENT INTERVENTIONS ON SCAPULAR KINEMATICS: A SYSTEMATIC REVIEW

INTRODUCTION: Pectoralis minor (PM) tightness has been shown to contribute to altered scapular mechanics, postural deviations, and shoulder dysfunction. Shortening of the muscle may increase scapular anterior tilt and internal rotation, restricting scapulothoracic motion and narrowing the subacromial space. The extent of these changes in scapular and spinal compensation has not been well established. Moreover, comparative effectiveness of stretching, manual therapy, exercise, and surgical release has not been systematically reviewed. This systematic review aimed to evaluate biomechanical and postural alterations associated with PM tightness and to determine whether targeted interventions improve scapular kinematics and thoracic alignment.

METHODS: This review followed PRISMA 2020 guidelines. Eligible studies included clinical or biomechanical investigations assessing PM length or tightness, scapular motion, thoracic or cervical alignment, or interventions targeting PM flexibility or function. Databases searched included PubMed/MEDLINE, Scopus, Embase, CINAHL, CENTRAL, and Google Scholar, limited from 2004-2024. Screening, data extraction, and risk-of-bias assessment were performed using NIH/NHLBI tools. Given substantial heterogeneity across study designs, populations, tightness definitions, and outcome measures, results were synthesized qualitatively.

RESULTS: Forty-nine studies met inclusion criteria, representing 2,644 analyzed shoulders. Cross-sectional research showed that PM tightness was associated with greater scapular anterior tilt and internal rotation, scapular dyskinesis, and altered postural patterns. Interventional trials indicated that PM stretching, proprioceptive neuromuscular facilitation, self-myofascial release, and scapular stabilization exercise increased PM length and improved scapular kinematics, pain, and function. Multimodal exercise programs produced longer-term improvements in forward shoulder posture, pain, and mobility. External supports such as figure-8 bracing acutely improved scapular alignment and muscle activation patterns. Surgical PM release was effective for refractory cases.

CONCLUSION: Across diverse populations and methodologies, PM tightness was associated with altered scapular kinematics and postural deviations. Treatment modalities focusing on the length of the PM, such as stretching and stabilization programs, have shown significant improvements in scapular motion, posture, and symptoms. Surgical release appears effective for select refractory presentations. Future research should standardize measurement methods and intervention parameters to improve comparability and guide optimal treatment strategies.

Abstract/Poster #: 151
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Stacey Cahoon, PhD
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THE ANTIRETROVIRAL BICTEGRAVIR CAUSES JOINT PAIN IN WILD-TYPE FEMALE MICE

INTRODUCTION: People with HIV (PWH) have an increased lifespan thanks to the success of combination antiretroviral therapy (ART). It is estimated that more than 50% of PWH report experiencing chronic pain1. The contribution of ART to joint pain is unknown. This study analyzed the effect of a commonly prescribed ART formulation (bictegravir (BIC)/tenofovir alafenamide (TAF)/emtricitabine (FTC)) on joint pain in female mice.

METHODS: Twenty-four female 12-week old C57BL/6 mice were given either regular mouse chow or ART-infused mouse chow for 13-weeks. All experiments were approved by the Institutional Animal Care and Use Committee (IACUC). The mice were split into two equal groups: vehicle (VEH) and BIC/TAF/FTC treated. Mechanical allodynia was assessed on the hind paws as described previously2 at baseline (prior to ART treatment), 6 weeks post-ART treatment, and again at the end of the study (13 weeks post-ART treatment). Locomotion, including total distance traveled and time spent immobile were calculated using AnyMaze software, was also assessed2. Grip strength was assessed as described previously2 at 13 weeks post-ART treatment. Data was analyzed using a repeated measures two-way ANOVA (GraphPad Prism 10).

RESULTS: Pain phenotyping assessed with mechanical allodynia and locomotive testing was evaluated at baseline, 6 weeks post-ART treatment and 13 weeks post-ART treatment while grip strength was evaluated 13 weeks post-ART treatment. Mechanical allodynia assessed the 50% withdrawal threshold which quantifies pain sensitization. BIC/TAF/FTC treated mice had significantly lower withdrawal thresholds compared to VEH ($p = 0.0055$). Additionally, the withdrawal threshold decreased over time for both groups ($p < 0.0001$). Locomotive testing showed that the distance traveled decreased over time ($p < 0.0001$) while time spent immobile increased over time ($p < 0.0001$) for both groups, but no differences between groups were observed.

CONCLUSION: BIC/TAF/FTC treatment led to a significant increase in mechanical sensitivity over the duration of the study. The results suggest that BIC/TAF/FTC, commonly prescribed as Biktarvy, may contribute to joint pain through sensitization of the nervous system.

REFERENCES 1. Madden et al., Pain Management, 2020. 2. Syx et al., Pain, 2020.

Abstract/Poster #: 152
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

Luisa Cedin, PT, MS
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STEPS TOWARD OSTEOARTHRISTIS REHABILITATION: TRANSLATIONAL DEVELOPMENT OF A MUSICAL-FEEDBACK GAIT RETRAINING SYSTEM

INTRODUCTION: Medial knee joint overload is a key biomechanical driver of knee osteoarthritis (OA), however existing gait retraining strategies often face barriers related to engagement and implementation. We developed a musical feedback system designed to medialize the center of pressure (CoP) and reduce knee adduction moment (KAM) through an intuitive, engaging auditory system. Following initial validation in healthy adults, this study examined feasibility, acceptability, and biomechanical responses in individuals with chronic knee pain as a translational step toward an OA therapeutic tool.

METHODS: Participants with chronic knee pain (n=10) and healthy participants (n=12) completed a musical-feedback training designed to medialized CoP. Plantar pressure, measured real-time using wireless insoles (Moticon ReGo), was modulated with a low-pass filter that muffled the music whenever lateral CoP exceeded 25% of baseline. Gait analysis was performed using 3D motion capture and force plates. Participants with chronic knee pain also answered questionnaires (NASA TLX and custom acceptability questionnaire). Biomechanical analyses focused on responders, defined by participants in both cohorts who medialized CoP. Spatiotemporal parameters, CoP, and KAM peaks were compared between baseline and post-training using paired t-tests.

RESULTS: All healthy participants significantly medialized CoP (average −11%) and, on average, both KAM peaks reduced without altering speed, cadence, foot progression angle, or step width. Kinematic adaptations included increased hip and ankle external rotations and decreased knee adduction at the KAM peaks, with less inversion/eversion range of motion throughout the gait. In addition to shifting their mediolateral CoP, the seven responders from the chronic knee pain cohort decreased their 1st KAM peak without altering spatiotemporal parameters. Notably, some non-responders also showed KAM reductions. Participants with knee pain reported high engagement, willingness to use the system, and moderate workload. Few participants reported reduced balance confidence and mild arch discomfort from the insole battery.

CONCLUSION: Across two cohorts, real-time musical feedback demonstrated high acceptability and moderate cognitive load. In the chronic knee pain group, unloading responses varied, likely reflecting heterogeneous gait strategies commonly observed in symptomatic populations. Together, these results support the feasibility of musical-feedback gait retraining and establish readiness for testing in knee OA populations.

Abstract/Poster #: 153
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: 2025 Summer Research Program

Vennela Challagondla, BS, MPH
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COMPENSATORY SCAPULOTHORACIC MECHANISMS AND GLENOHUMERAL DEFICITS IN ROTATOR CUFF PATHOLOGY: A MULTI-SITE 3D MOTION CAPTURE BIOKINETIC ANALYSIS OF 76 SHOULDERS

INTRODUCTION: Rotator cuff pathology often presents along a spectrum of functional limitations. These disorders affect shoulder strength, range of motion (ROM), and scapulohumeral rhythm, yet few studies have evaluated these biokinetic factors simultaneously. This study aimed to compare shoulder kinematics during arm elevation, as well as measures of strength and passive ROM, between affected shoulders and their contralateral healthy shoulders in individuals with rotator cuff pathology.

METHODS: This cross-sectional observational study evaluated 38 adults who presented with unilateral rotator cuff pathology and a healthy contralateral shoulder (mean age 47 ± 12.8 years; 31.6% female) across five motion analysis laboratories. Bilateral 3D scapulothoracic and glenohumeral kinematics during scapular-plane elevation, passive ROM testing, and isometric strength testing (normalized to body weight) were obtained. Kinematic data were collected using a four-camera high-speed motion capture system using International Society of Biomechanics standards.5 Variables included glenohumeral elevation, scapular upward rotation, tilt, internal/external rotation, vertical displacement, maximum humeral elevation, and scapulohumeral rhythm. Passive shoulder ROM was measured using a digital inclinometer, and isometric strength was assessed using a hand-held dynamometer. Paired t-tests ($p < 0.05$) compared affected and contralateral shoulders and effect sizes were reported using Cohen's d.

RESULTS: Kinematic differences emerged only above 90° of elevation. Compared with the contralateral shoulder, the affected side showed reduced glenohumeral elevation (61.5° ± 8.8° vs. 64.3° ± 6.8°; P = 0.011), reduced maximum humeral elevation (153.6° ± 15.2° vs. 158.7° ± 14.9°; P = 0.003), greater scapular upward rotation (29.9° ± 6.7° vs. 27.3° ± 5.4°; P = 0.011), and increased scapulohumeral rhythm (0.50 vs. 0.43; P = 0.002). No significant differences were observed below 90°. Passive ROM did not differ between sides. Strength deficits were limited to external rotation in the neutral position ($P < 0.05$). Effect sizes ranged from 0.23-0.35.

CONCLUSION: Individuals with rotator cuff pathology demonstrated increased scapular upward rotation and decreased glenohumeral elevation during higher-range arm elevation, consistent with compensatory mechanisms reported in prior studies. These adaptations may increase joint reaction forces, potentially contributing to long-term dysfunction. Integrating strength, ROM, and kinematic assessments can identify impairments and compensatory strategies to address clinically.

Abstract/Poster #: 154
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

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PERIOSTIN, NOT PERIOSTIN EXPRESSING CELLS, IS CRITICAL FOR CALVARIAL BONE REGENERATION

INTRODUCTION: Intramembranous bone regeneration is vital for orthopedic and dental procedures and our recent studies demonstrated to be regulated by periostin (Postn). Postn stimulates osteogenesis, and while its deletion impairs ossification involving Postn-expressing cells (PECs) on long bones, the functional requirement of endogenous PECs and Postn in calvarial defect healing remains largely uninvestigated. Therefore, we hypothesized that Postn and PECs are required for calvarial defect healing in mice.

METHODS: We used mice with tamoxifen inducible cre inserted into endogenous locus of Postn gene (Postn-MCM/+), thereby leading to Postn haploinsufficiency and Postn-MCM/Postn-MCM being Postn KO. These mice were crossed to either tdTomato to fluorescently trace PECs or ROSA-DTA to ablate PECs. All mice underwent a procedure to create a critical-sized, 1.85 mm circular defect on the parietal bone of 4-week-old mice. Bone regeneration was analyzed via µCT and histology.

RESULTS: We assessed the empty volume via microCT and found that MCM/MCM;tdTomato mice (38% ± 20 of total volume) exhibited 2.9-fold greater volume over MCM/+;tdTomato (14% ± 4.2 of total volume) ($p = 0.11$), suggesting that MCM/MCM;tdTomato did not regenerate the calvarial defect as well as MCM/+;tdTomato mice. In contrast, when comparing MCM/+;DTA (18% ± 1.6 of total volume) and +/+;DTA+; DTA (19% ± 7.1 of total volume), we found that regenerated volume was similar ($p = 0.81$), suggesting that neither haploinsufficiency of Postn or PEC ablation impairs calvarial defect healing.

CONCLUSION: In summary, our studies demonstrate that Postn deletion impairs calvarial defect healing, but PEC ablation does not. This corroborates prior observations that Postn administration accelerates bone healing (Heo et al. PLoS One 2015) and highlights its importance in bone regeneration. Interestingly, PEC ablation did not impair calvarial defect healing, suggesting that these cells likely do not contribute to bone regeneration. Future studies will examine distribution of PECs during calvarial defect healing.

Abstract/Poster #: 155
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Felipe F. Gonzalez, MD, MSc
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GAIT BIOMECHANICS IN MEDIAL MENISCUS POSTERIOR ROOT TEARS AND REPAIRS: ASSESSING ESTABLISHED RISK FACTORS FOR KNEE OSTEOARTHRITIS

INTRODUCTION: A large proportion of individuals with medial meniscus posterior root (MMPR) tears progress to knee osteoarthritis even after surgical repair. Gait analysis can help identify modifiable biomechanical risk factors to optimize knee joint loading through gait modification interventions. The objective of this study was to define gait kinematics and kinetics in patients with MMPR tears and those with MMPR repairs, compared to healthy, age-matched controls. We hypothesized that patients with MMPR tears and repairs would exhibit altered gait characteristics associated with joint degeneration.

METHODS: In this cross-sectional study, 58 knees were analyzed: MMPR tear (n=20), MMPR repair (n=21), and healthy controls (n=17). All individuals in the repair group had previously undergone transtibial pullout repair performed by a single fellowship-trained surgeon. Gait analysis was conducted using a marker-based 3D motion capture system and force plates. Primary outcomes included knee joint kinematics and kinetics. Statistical comparisons were made using discrete analysis and Statistical NonParametric Mapping to evaluate differences across the gait cycle among groups. Patient-reported outcomes were also assessed using IKDC, KOOS Jr., VR-12, and VAS pain scores. Group comparisons were performed using the Kruskal-Wallis test. The significance level was set at 5%.

RESULTS: Both MMPR tear and repair groups exhibited increased knee varus thrust (Tear: 5.0° ± 2.1; Repair: 5.2° ± 2.0; Control: 3.3° ± 0.9; $P < 0.01$), decreased tibial internal rotation at loading response (Tear: -6.2° ± 5.3; Repair: -2.1° ± 3.6; Control: 2.2° ± 5.8; $P < 0.01$), and greater knee adduction angle (varus) at midstance (Tear: 0.1° ± 3.9; Repair: -0.1° ± 5.0; Control: -5.9° ± 4.1; $P < 0.01$). The MMPR repair group exhibited higher functional scores (IKDC: 75.3 ± 19.9 vs. 43.6 ± 14.2; KOOS Jr.: 84.7 ± 15.4 vs. 59.7 ± 8.9; $P < 0.01$), lower pain levels (VAS: 1.5 ± 2.1 vs. 3.8 ± 2.4; $P < 0.01$), and higher tibial internal rotation compared to the tear group ($P < 0.05$; ES: 0.95).

CONCLUSION: The repair group showed more favorable clinical and biomechanical variables than the tear group. However, both groups exhibited established biomechanical risk factors for knee OA progression, such as varus thrust. Motion analysis can be used to detect early biomechanical issues and help identify MMPR tear and repair candidates for timely gait-modification interventions to improve long-term joint health.

Abstract/Poster #: 156
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

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CHARACTERIZING SENSORY NEURON-FIBROBLAST INTERACTIONS IN A MOUSE MODEL OF ELHERS-DANLOS SYNDROME

INTRODUCTION: Ehlers-Danlos Syndrome (EDS) is a connective tissue disorder caused by dysfunctional collagen synthesis that results in hyperalgesia, fragile skin, and chronic pain in patients; however, the cellular mechanisms linking sensory neurons to the altered collagen matrix environment remain poorly understood. Dorsal root ganglion (DRG) neurons and tissue fibroblasts likely interact to influence neuronal excitability and pain signaling pathways, but these interactions have not been previously characterized in EDS models. The objective of this project is to establish an in vitro model to investigate how fibroblasts derived from an EDS mouse model, Col5a1+/-, influence neuronal growth and pain-related pathway signaling.

METHODS: To build this model, we are incorporating primary mouse cells cultured from the DRG and from skin-derived fibroblasts. Lumbar level L3-L5 DRGs were dissected and pooled from 2 WT mice, enzymatically digested, and maintained in cell culture on petri dishes coated with laminin for one week. Fibroblast cultures were established in vitro from skin biopsies and grown in supplemented DMEM optimal media for multiple weeks. All procedures were performed in accordance with the Rush Institutional Animal Care and Use Committee (IACUC) guidelines. To evaluate the viability and morphology of DRGs, cholera toxin B (CTB) and phosphodium iodide (PI) staining were used to visualize the percentage of live vs. dead cells in culture.

RESULTS: By optimizing the digestion protocol of the DRG tissue, the viability of DRG cells was improved from 40% to 95%. Additionally, the amount of axonal outgrowth was shown to be positively correlated with overall culture viability. Fibroblasts were also shown to expand from the skin biopsy of one mouse over a period of 3 weeks to reach 80% confluency. Finally, we have identified 3 different micro-fluidics chips (Xona, eNuvio, custom-made) that we will utilize to test the viability of these two different cell types in co-culture.

CONCLUSIONS: Establishing proficiency in these foundational techniques provides confidence in developing the proposed in vitro model using microfluidic chips, where we can study DRG-fibroblast interactions in both wild-type and EDS model mice.

Abstract/Poster #: 157
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

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MODELING OSTEOARTHRITIS IN VITRO: COMPARISON OF RNA EXPRESSION BETWEEN HUMAN INDUCED PLURIPOTENT STEM CELL DERIVED SENSORY NEURONS AND HUMAN DORSAL ROOT GANGLIA

INTRODUCTION: Modeling pain in animal models suffers from many limitations including poor translation from animal to human. Thus, a more concerted effort to use human tissue and/or cells to study pain is needed to improve clinical outcomes. Sensory neurons derived from human induced pluripotent stem cells (hIPSC-SNs) are an emerging tool to study nociceptor sensitization and plasticity in vitro; however, more work needs to be done to characterize these cells in comparison to normal human dorsal root ganglia (DRG) neurons. Here, we compare expression patterns of hIPSC-SNs and human DRG tissue sections using RNAscope.

METHODS: hIPSC-SNs (RealDRGsTM, Anatomic Inc.) were matured in 24-well plates for 1-6 weeks using ChronoTM Senso-MM maturation media. Snap-frozen L4 DRG tissues were obtained through AnaBios from one male (61 y.o.) and one female (66 y.o.) donor. RNAscope was performed on both cells and tissues with probes for MRGPRD, Piezo2, and SCN10A.

RESULTS: SCN10A, encoding the Nav1.8 sodium channel, was widely expressed in human DRG neurons, as expected; however, the number of hIPSC-SNs expressing SCN10A was relatively low. Roughly 14% of hIPSC-SNs expressed SCN10A after 1 week of maturation, which dropped through 6 weeks of maturation to about 3.4%. Expression of the mechanosensitive ion channel Piezo2 was similar in both human DRG neurons (~31% of cells) and hIPSC-SNs (~33% at 1 week, ~44% at 6 weeks). Expression of Mas-related G protein-coupled receptor (MRGPRD) was not detected in hIPSC-SNs; it was detected in 5.7% of human DRG neurons.

CONCLUSION: Several observations can be made from these data. First, DRG neurons are known to contain a heterogenous population of nociceptor subtypes. hIPSC-SNs naturally organize into heterogenous subpopulations as well, noted by the differential gene expression found herein. Second, the relative lack of SCN10A and MRGPRD expression in hIPSC-SNs compared to human DRG neurons indicates maturation of hIPSC-SNs needs to be optimized for studying these specific channels/receptors. Finally, comparable expression of Piezo2 in human DRGs and hIPSC-SNs suggests the latter can be used to study mechanical sensitization in vitro. Specifically, this lends itself well to the application of compressional forces on nerve endings in a microfluidic model of OA.

Abstract/Poster #: 158
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: 2025 Summer Research Program

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THE UTILITY OF JUMPING TASKS FOR THE PREDICTION OF CLINICAL OUTCOMES IN ORTHOPEDIC PATHOLOGIES

INTRODUCTION: Orthopedic injuries account for approximately 1 million hospital visits annually, as well as physical, psychological, and socioeconomic burdens. Identifying valid and low-cost prognostic tools can help better assess injury risk, recurrence, and recovery potential. Various studies have explored jumping tasks as predictors of clinical outcomes, yet findings remain fragmented. Existing reviews primarily focus on anterior cruciate ligament (ACL) injuries, leaving a gap in understanding their predictive value for other musculoskeletal (MSK) conditions. This review aimed to determine whether jumping tasks can predict musculoskeletal (MSK) injuries and to identify additional clinical outcomes that may also be predicted by these assessments.

METHODS: **METHODS**: This systematic review followed PRISMA guidelines and was registered in PROSPERO. Searches were conducted in PubMed/MEDLINE, Scopus, Cochrane CENTRAL, IEEE Xplore, and Google Scholar. Eligible studies included human longitudinal designs evaluating jumping tasks as prognostic tools for musculoskeletal (MSK) injuries. Exclusion criteria were ACL-focused studies, nonhuman or robotic models, case reports/series, and studies without ethical approval. Three reviewers independently screened studies and extracted data on jump task type and its association with injury. The primary outcome was MSK injury risk associated with biomechanical factors identified during jumping tasks; secondary outcomes included any additional clinical outcomes predicted by these tasks.

RESULTS: A total of 60 studies were included in this review. Of the 51 studies involving healthy, predominantly young, athletic individuals, 37 identified jumping tasks as significant predictors of injury risk. Among the 9 studies involving participants with existing orthopedic conditions, 6 found jumping tasks to be predictive of the assessed clinical outcomes.

CONCLUSION: Jumping tasks are a promising tool for the prognosis of musculoskeletal injuries, beyond ACL tears, in healthy, young, athletic populations, with less consistent evidence for individuals with pre-existing orthopedic pathologies. While jump tests may help identify individuals at-risk, they should be interpreted alongside other clinical assessments. The heterogeneity of the studies and their methodological limitations impair the strength of the evidence and warrant caution when interpreting the collective prognostic value of jumping tasks to predict musculoskeletal injuries. Standardized protocols and reporting are needed before jumping tasks can be broadly applied in orthopedic prognosis.

Abstract/Poster #: 159
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

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TENOFOVIR-BASED ANTIRETROVIRAL TREATMENT SUPPRESSES ADIPOGENIC GENE EXPRESSION IN BONE MARROW ADIPOCYTES

INTRODUCTION: Bone loss is a known side effect of antiretroviral therapy (ART). These effects are especially relevant in the tenofovir prodrug tenofovir disoproxil fumarate (TDF)-based therapies. Bone toxicity in people living with HIV (PWH) is often associated with ART initiation or an immune response to HIV infection. However, the direct impact of tenofovir-based ART on bone cells has primarily been described in vitro, and limited studies have investigated the affected molecular pathways in vivo. Bone marrow is not only the source for both osteoblast and osteoclast precursors, but also contains a population of adipocytes, which contribute to bone mass regulation. Data describing the impact of ART on bone marrow is lacking. This study examines the effects of TDF and tenofovir alafenamide (TAF) in bone and bone marrow in wild-type female mice.

METHODS: Twelve-week-old C57BL/6 female mice were treated for 13-weeks with emtricitabine (FTC)/TDF/dolutegravir (DTG) or FTC/TAF/DTG. Femoral cortical and lumbar spine trabecular bone mineral density (BMD) were assessed by dual-energy X-ray absorptiometry (DXA), while microcomputed tomography (microCT) was used to evaluate bone architecture in the left femur. Femur RNA was analyzed using qPCR for osteogenic markers (ACP5, CTSK, BGLAP, SOST) and bone marrow RNA was used to analyze adipogenic markers (adiponectin, leptin, PPARG), normalized to GAPDH. One-way ANOVA with Tukey's multiple comparisons tests were used to evaluate data.

RESULTS: Neither ART affected lumbar spine BMD. TDF-based treatment led to a significant reduction in femoral BMD, while TAF had no effect. Gene expression analysis showed that osteogenic markers in the femur (ACP5, CTSK, BGLAP, and SOST) were not different between treatments. Bone marrow adiponectin expression was not affected, but leptin expression was suppressed by both TDF and TAF. Additionally, PPARG was significantly reduced in TAF but not in TDF, suggesting an effect on marrow adipocyte differentiation.

CONCLUSION: The current study recapitulates TDF-induced bone loss commonly seen clinically but surprisingly, found no effect of TDF on skeletal expression of remodeling-related genes. Instead, expression changes were noted in the bone marrow compartment, consistent with impaired adipocyte differentiation. Experiments are currently underway to determine whether the bone marrow gene expression changes contribute to bone loss.

Abstract/Poster #: 160
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Hoomin Lee, PhD
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ENDOTHELIAL-TO-MESENCHYMAL TRANSITION DURING BONE REGENERATION VIA INTRAMEMBRANOUS OSSIFICATION

INTRODUCTION: During Endothelial-to-mesenchymal transition (EndMT) endothelial cells lose their identity and acquire mesenchymal properties. EndMT contributes to various physiological and pathological processes, such as wound healing and fibrosis. Most studies of bone regeneration have neglected endothelial cell plasticity, focusing instead on angiogenesis by endothelial cells. Therefore, we examined whether EndMT contributes to bone regeneration.

METHODS: To examine EndMT, we used fluorescent reporter mice (Cdh5-creERT2;tdTomato) undergoing mechanical femoral bone marrow ablation at 28 days old, a model of intramembranous bone regeneration. Tamoxifen was administered at 7 (T7) or 28 (T28) days old to label $Cdh5^+$ descendants (T7) or both $Cdh5^+$ cells and their descendants (T28) with tdTomato in the regenerating tissue. Femurs were harvested on post-operative days 7 (P7) or 10 (P10) and stained for α-smooth muscle actin (αSMA), osterix, and endomucin. Flow cytometry was performed on regenerating bone marrow cells from intact controls and P7 samples for tdTomato and αSMA. EndMT was modulated systemically using dapagliflozin (DAPA, inhibitor) or lipopolysaccharide (LPS, activator).

RESULTS: EndMT was detected in both T7 and T28 groups by cells co-expressing tdTomato and αSMA, a mesenchymal marker. At P7, double-positive cells in the regenerating tissue were 2.04% (T7) and 3.65% (T28) of tdTomato+ cells and at P10, 2.42% (T7) and 3.22% (T28). Flow cytometry confirmed that the proportion of double-positive cells was higher in both T7 (1.15%) and T28 (2.86%) groups than the control (0.18%) at P7. Endomucin expression decreased at P7 indicating loss of endothelial phenotype. No tdTomato+ cells were osterix+ in the regenerating tissue at any time point. Systemic EndMT activation by LPS increased the number of double-positive cells and reduced bone formation in the marrow cavity, while EndMT inhibition by DAPA reduced double-positive cells and increased trabecular bone.

CONCLUSION: In summary, we found that EndMT contributes to intramembranous bone regeneration. A subset of Cdh5+ cells undergo a mesenchymal-like transition and lose endothelial identity, but do not directly become bone-forming cells. Interestingly, EndMT activation impairs bone regeneration, while its inhibition promotes bone regeneration, suggesting a novel therapeutic target to improve clinical procedures such as distraction osteogenesis, stress fracture healing, and implant integration, which rely on intramembranous bone regeneration.

Abstract/Poster #: 161
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: 2025 Summer Research Program

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LOW-FIELD (0.55 T) T_1P MRI FOR DISPERSION CHARACTERIZATION AND VOXEL-WISE ASSESSMENT OF PROTEOGLYCAN-DEPLETED CARTILAGE

INTRODUCTION: Quantitative MRI, particularly $T_1\rho$ mapping, enables spatially resolved assessment of cartilage proteoglycan content. Low-field 0.55 T MRI offers reduced susceptibility and magic-angle artifacts, enhanced B_1 homogeneity, longer T_2 for improved signal preservation, and lower specific absorption rate-features that support artifact-free imaging and early detection of cartilage degeneration. However, optimal $T_1\rho$ sequence parameters for in vitro cartilage imaging remain unclear, and $T_1\rho$ dispersion behavior at 0.55 T has not been systematically characterized. This study aimed to (1) characterize cartilage $T_1\rho$ dispersion at 0.55 T and (2) assess the relationship between $T_1\rho$ relaxation and proteoglycan depletion in enzymatically degraded tissue.

METHODS: Cartilage plugs from two bovine patellofemoral joints were bisected and incubated for 24 hours in either trypsin (15 µg/mL) or phosphate-buffered solution. Samples were imaged on a 0.55 T tabletop MRI system. Spin-lock frequencies (FSL) ranged from 100-600 Hz, and spin-lock times (TSL) from 0-50 ms. $T_1\rho$ values were obtained by mono-exponential fitting; T_2 was measured using multi-echo imaging. SNR was Rician-corrected, and CNR was calculated from ROI signal differences. $T_1\rho/T_2$ ratios were calculated as a normalized metric to emphasize proteoglycan content in cartilage while reducing the confounding effects of collagen orientation and water content.

RESULTS: Both control and degraded cartilage exhibited expected $T_1\rho$ dispersion, with $T_1\rho$ increasing with FSL. Trypsin-treated regions consistently showed longer $T_1\rho$ (e.g., 108-153 ms) compared with controls (63-122 ms). SNR values ranged from 15-41 across samples, and CNR from 0.73-3.80, with higher CNR generally reflecting greater matrix degradation. T_2 values were also prolonged in degraded tissue. $T_1\rho/T_2$ ratios varied with FSL and differentiated degraded from control regions, indicating sensitivity to proteoglycan loss. Trypsin treatment produced mild swelling (~8%), while controls showed minimal changes.

CONCLUSIONS: Low-field 0.55 T $T_1\rho$ MRI detects subtle biochemical alterations in cartilage, with $T_1\rho$ prolongation reflecting proteoglycan depletion. Optimal FSL selection requires balancing sensitivity to matrix changes ($T_1\rho/T_2$ ratio) against measurement reliability (SNR, CNR). Findings demonstrate the feasibility of low-field $T_1\rho$ dispersion imaging for early cartilage assessment and provide guidance for parameter selection in future in vitro and translational studies.

Abstract/Poster #: 162
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M4

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THE MISMATCH BETWEEN STRUCTURAL SPINE DISEASE AND LOW BACK PAIN: A SYSTEMATIC REVIEW OF LONGITUDINAL STUDIES

INTRODUCTION: Low back pain (LBP) is a leading cause of disability worldwide, and Global Burden of Disease projections estimate that by 2050 more than 800 million people will be affected. Despite this substantial global burden, meaningful predictors of LBP have yet to be identified. This review synthesizes longitudinal evidence on the relationship between degenerative lumbar spine disease and incident LBP.

METHODS: A systematic review was conducted in accordance with PRISMA guidelines. PubMed/MEDLINE, Embase, Scopus, CINAHL, and Google Scholar were searched from inception to February 17, 2025. After screening 2,036 unique records and assessing 110 full-text articles, 9 prospective cohort studies met inclusion criteria. Eligible studies included adults ≥18 years, baseline and follow-up lumbar imaging (MRI, CT, or radiographs), and longitudinal LBP assessment. Extracted imaging features included disc degeneration (DD), modic changes (MC), disc bulge/protrusion/extrusion, annular fissures (AF), disc height narrowing, osteophytes (OST), spondylolisthesis, facet joint osteoarthritis (FOA), central canal stenosis, disc signal loss, Schmorl's nodes, and high-intensity zones (HIZ). Due to heterogeneity in methodology and outcome definitions, findings were synthesized descriptively.

RESULTS: Nine studies (N ≈ 2,115; unique N ≈ 1,578) with 1-16 years of follow-up were included. Significant baseline predictors of future LBP included Pfirrmann summary scores (1/1), OST (1/1), and overall spine osteoarthritis (1/1), whereas disc protrusion was protective in one study (HR 0.5). Most other baseline findings-including DD, MC, FOA, spondylolisthesis, and disc signal changes-were not associated with future LBP. Incident degenerative findings during follow-up showed limited associations, with AF significant in one study, while DD, bulge, HIZ, MC, and spondylolisthesis were consistently non-significant. Worsening of degenerative features similarly demonstrated no meaningful association with incident LBP.

CONCLUSION: Across 9 longitudinal cohorts, degenerative lumbar spine findings showed minimal and inconsistent associations with future LBP. Given the small number of studies and methodological heterogeneity (e.g., studied populations, pain definitions, and statistical methods), definitive conclusions cannot yet be drawn. Large, standardized, population-based longitudinal studies are needed to clarify the clinical relevance of specific degenerative features in predicting low back pain.

Abstract/Poster #: 163
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

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GLP-1 RECEPTOR AGONIST THERAPY IS NOT ASSOCIATED WITH ADVERSE EVENTS FOLLOWING SHOULDER SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

INTRODUCTION: Glucagon-like peptide-1 agonists (GLP-1s) are increasingly prescribed for type 2 diabetes mellitus (T2DM) and obesity, with over 12% of the United States population reported to being using this medication. While GLP-1s have been associated with reduced complication rates in total hip and knee arthroplasty populations, their association with outcomes after shoulder surgery remains unclear. The purpose of the current study was to perform a systematic review and meta-analysis of studies comparing adverse events between GLP-1 users and non-users following shoulder surgery.

METHODS: A PRISMA-compliant literature search of PubMed, Embase, and Scopus was performed in August 2025. Comparative studies (Level of Evidence I-III) assessing postoperative adverse events in GLP-1 and non-GLP-1 users undergoing total shoulder arthroplasty (TSA) or shoulder arthroscopic procedures were included. Data pertaining to 90-day and 2-year complication rates were extracted. Random effects meta-analyses were conducted independently for TSA studies and pooled odds ratios with confidence estimates were quantified. Outcomes of studies examining arthroscopic procedures were described narratively given limited data.

RESULTS: Six studies encompassing outcomes of 43,415 patients were included. Four (66.7%) studies evaluated TSA, while one evaluated arthroscopic RCR and one manipulation under anesthesia/capsular release for adhesive capsulitis (AC). The overall pooled 90-day complication rate following TSA was 18.1% for GLP-1 users and 15.9% for non-users (OR 0.86, 95% CI 0.36-2.07, p=0.74). The overall pooled 2-year complication rate following TSA was 3.8% in the GLP-1 group and 3.7% in the non-GLP-1 group (OR 1.24, 95% CI 0.73-2.00, P = 0.42). The RCR and AC studies reported significantly lower 90-day complication rates for GLP-1 users (11.0% vs. 27.4%) and (2.5% vs. 4.8%), respectively. A lower re-tear rate was observed in GLP-1 users compared with non-users by two-years postoperatively (12.5% vs. 18.3%).

CONCLUSION: GLP-1 agonist use is not significantly associated with 90-day or two-year adverse events following TSA. Based on this data, GLP-1 agonist use should not be a contraindication for proceeding with TSA. Lower complication rates were observed in both studies concerning arthroscopic intervention for non-arthritic shoulder conditions.

Abstract/Poster #: 164
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Alia Obeidat, PhD
Alia M Obeidat1, Jun Li1, Spencer Fullam1, Roderick G Carter1, Merissa Olmer2, Bella Mehta3,4, Miguel Otero3,4, Daniel Ramirez3,4, Richard J Miller5, Dana E. Orange3,6, Martin Lotz2, Rachel E Miller1, Anne-Marie Malfait1. 1Division of Rheumatology, Department of Internal Medicine, Rush University, Chicago IL. 2Department of Molecular Medicine, Scripps Research, La Jolla, CA. 3Hospital for Special Surgery, New York, NY. 4Weill Cornell Medical College, New York, NY. 5Department of Pharmacology, Northwestern University Feinberg School of Medicine, Chicago IL. 6Rockefeller University, New York, NY.

MAPPING THE SYNOVIAL INNERVATION OF THE HEALTHY HUMAN KNEE JOINT

BACKGROUND: Knee joints are densely innervated by sensory neurons, predominantly nociceptors. Precise information on the innervation of healthy human synovium and the changes that accompany osteoarthritis (OA) is limited. A few studies have described innervation changes in select areas of synovium collected at total knee arthroplasty. Here, we sought to perform a comprehensive analysis of the innervation of the synovium of healthy human knees.

METHODS: Synovial tissues were obtained post mortem from male donors aged 23, 42, 52, and 81 years through Scripps. All knees were graded 1-1.5 based on the Modified Outerbridge classification for cartilage damage. For each donor, a total of 18 tissue blocks were collected from 18 distinct synovial locations in the knee. Tissues were formalin fixed, paraffin embedded, sectioned at 5□m and stained with hematoxylin and eosin. Adjacent sections were used for immunohistochemical staining with the pan-neuronal marker, PGP9.5 (Abcam ab27053, 1:200), endothelial cell markers (CD31, Abcam Ab28364, 1:50) or isotype control (Rabbit IgG, Abcam Ab172730,1□g/ml). Proteinase K was used for antigen retrieval. Sections were incubated with primary antibody at 4°C overnight, stained with biotin-streptavidin/HRP and DAB chromogen, and counterstained with methyl green. PGP9.5+ and CD31+ signal were quantified in adipose and non-adipose areas of synovium using Qupath by 2 blinded observers. Average scores are reported.

RESULTS: Overall, the synovium appeared normal with focal areas of fibrosis and hyperplasia. For all donors in all 18 regions, PGP9.5+ innervation was denser in the adipose-rich areas compared to the non-adipose areas. PGP9.5+ nerve signal was abundant in the synovium of medial and lateral femoral gutters, medial and lateral suprapatellar compartment, anterior synovium and synovium of the suprapatellar fat pad. PGP9.5+ nerves were more abundant in the medial synovium of the 81yr-old compared to younger donors. PGP9.5 innervation of SPFP and anterior and lateral perimeniscal synovium declined with age but increased in the lateral femoral gutters.

CONCLUSIONS: PGP9.5+ nerve fibers were abundant in medial, lateral and anterior synovium of non-OA male donors aged 23 to 81, but a marked heterogeneity was observed across the 18 regions. Adipose-rich synovium showed more innervation compared to non-adipose synovium. These findings provide the foundation for future OA studies.

Abstract/Poster #: 165
Session: Oral Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Jun Oike, MD, PhD
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CMTX-101 IMPROVES BACTERIAL CLEARANCE IN A MOUSE MODEL OF PERIPROSTHETIC JOINT INFECTION

INTRODUCTION: Periprosthetic joint infection (PJI) is difficult to treat due to biofilm protection against antibiotics and host immunity. CMTX-101 is a monoclonal antibody targeting DNABII proteins to collapse the biofilm matrix. We evaluated whether adjunctive intravenous CMTX-101 enhances bacterial clearance, biofilm disruption, and bone-related outcomes compared with vancomycin alone in a mouse PJI model.

METHODS: Twelve-week-old C57BL/6 male mice received intramedullary stainless-steel femoral implants, with position confirmed by X-ray. Mice were inoculated with 1×10^3 CFU of bioluminescent Staphylococcus aureus Xen36 and randomized on day 7 to vehicle, vancomycin, or vancomycin plus CMTX-101 group (n=20-24 mice/group). Longitudinal bacterial burden was assessed through day 28 using bioluminescence imaging (BLI). Radiographs evaluated periosteal reaction, bone loss, and implant migration. At study conclusion**,** CFUs were quantified from peri-implant tissue and implants, and biofilm architecture was assessed by scanning electron microscopy (SEM). Samples for microCT and H&E staining were collected and analyses are ongoing.

RESULTS: All 92 mice completed follow-up. Vancomycin monotherapy produced only temporary suppression of BLI signal with relapse at the final time point, whereas CMTX-101 combination therapy resulted in sustained suppression. Adjunctive CMTX-101 reduced bacterial burden by ~2 logs in peri-implant tissue and implants and increased implant culture-negativity from 0% to 33%. SEM revealed dense biofilm in vehicle and vancomycin groups, while CMTX-101 combination implants showed minimal to absent biofilm with leukocytes lining the surface. Radiographs demonstrated treatment-related differences in periosteal reaction, bone loss, and implant migration.

CONCLUSION: Adjunctive CMTX-101 significantly improved infection-control outcomes-including bacterial clearance, biofilm reduction, and implant culture-negativity-compared with vancomycin alone. Multimodal assessment (BLI, CFU, SEM, radiographs, and planned microCT/H&E) supports CMTX-101 as a promising systemic biofilm-targeting therapy for PJI.

Abstract/Poster #: 166
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

Carolline Popovicz Nunes, MD, Orthopaedic Surgeon (Brazil)
Carolline Popovicz Nunes, MD(1, 2); Felipe F. Gonzalez, MD(1, 2); Guilherme Pontes Saad, BA(1,3); Alexandre Maioli, BA(1,4); Tiago Zimerman, MD(1, 2); Marcos Amstalden Barros, MD(1, 2); Eliane C. Guadagnin, PhD(2); Jorge Chahla, MD PhD(1); Jonathan Gustafson, PhD(1,2), Leonardo Metsavaht, MD PhD(2), Gustavo Leporace, PhD(2) Affiliations: 1 Department of Orthopaedics, Rush University Medical Center 2 Instituto Brasil de Tecnologias da Saúde, Rio de Janeiro, RJ, Brazil 3 Univeristy of Miami, Biomedical Engineering, Coral Gables, USA 4 Federal University of Rio de Janeiro (UFRJ), RJ, Brazil 5 Rush University Medical College, Chicago, IL

WHEN JUMPING HURTS: A SYSTEMATIC REVIEW OF JUMP BIOKINETICS IN FEMALES WITH PATELLOFEMORAL PAIN

INTRODUCTION: Women experience a disproportionately high burden of patellofemoral pain (PFP) and may be up to twice as likely as men to develop symptoms in sports that involve repetitive loading, cutting, and jumping. These higher rates have been linked to biomechanical patterns commonly observed in women with PFP that increase patellofemoral joint stress. However, most biomechanical studies pool sexes, limiting the ability to identify movement patterns specific to female athletes. Sex-specific analyses are therefore essential to accurately characterize patellofemoral mechanics and guide targeted interventions for women. The objective of this study was to characterize biomechanical patterns in women with PFP during functional jumping tasks and determine whether these patterns differ from asymptomatic controls across different jump types.

METHODS: A systematic search of six databases (September 2025) was conducted following PRISMA guidelines. Eligible studies reported kinematic or kinetic outcomes from jump-landing tasks in women with PFP. Studies lacking sex-specific female data, including participants with prior knee surgery, evaluating only non-jump tasks, or focusing on other diagnoses were excluded. Standardized mean differences were pooled using random-effects models in R.

RESULTS: Thirteen studies met inclusion criteria, including 135 women with PFP and 132 controls. Four jumping tasks were evaluated: single-leg drop jump, double-leg drop jump, single-leg vertical jump, and single-leg horizontal hop. Compared with controls, women with PFP demonstrated greater hip internal rotation (SMD = 0.53; 95% CI, 0.05-1.01; $p = 0.0063$), increased hip adduction (SMD = 1.82; 95% CI, 0.31-3.32; $p < 0.0001$), and larger contralateral pelvic drop (SMD = 1.77; 95% CI, 0.09-3.44; $p < 0.0001$), with heterogeneity ranging from moderate to very high. Other biomechanical variables showed inconsistent findings.

CONCLUSION: Across multiple jumping tasks, women with PFP exhibited a consistent pattern of greater hip internal rotation, increased hip adduction, and larger contralateral pelvic drop relative to asymptomatic controls. These findings emphasize that proximal mechanical factors are central to the biomechanical presentation of PFP during jump-landing tasks in women.

Abstract/Poster #: 167
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

Nicole Potter, MA, BA
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STRENGTH, BALANCE, COGNITION: WHAT WORKS TO PREVENT FALLS IN AGING ADULTS?

INTRODUCTION: Falls remain the leading cause of injury among older adults, affecting one in four Americans aged ≥65 each year. Established prevention strategies (e.g., medical factors and home hazard modification) can reduce fall risk, yet the role of training-based interventions in fall prevention remains underexplored. This systematic review and meta-analysis evaluated the impact of muscle strengthening, balance, and cognitive stimulation interventions on balance and fall reduction among older adults.

METHODS: A comprehensive database search was conducted with no geographic or language restrictions. Eligible studies were randomized controlled trials (RCTs) evaluating muscle strengthening, balance, and cognitive stimulation interventions with balance as the primary outcome and falls as a secondary outcome. Inclusion criteria required a no-intervention control, participants aged ≥60 years, and no diagnosed cognitive impairment or medical conditions associated with fall risk. Two authors independently screened all studies within Covidence, with disagreements resolved by consensus or a third reviewer. Meta-analyses were performed when outcomes were comparable.

RESULTS: The search identified 6,541studies; 99 of which met the inclusion criteria. The most clinically relevant outcomes - Berg Balance Scale (BBS) and Timed Up and Go (TUG) - are reported here. The pooled analysis showed that muscle strengthening (6 RCTs, 277 participants) significantly improved BBS scores (MD=2.53, 95%-CI 1.69; 3.36, p<0.0001, I2=0.0%). Balance training (9 RCTs, 834 participants) statistically improved BBS scores (MD=2.33, 95%-CI 0.69; 3.98, p=0.0054, I2=75.9%) however, cognitive stimulation (3 RCTs, 124 participants) showed no significant effect when compared to controls (MD=0.89, 95%-CI -0.42; 2.20, p=0.184, I2=0.0%). Muscle strengthening (18 RCTs, 1,702 participants) statistically improved TUG performance (MD=-1.06, 95%-CI -1.56; -0.56, p<0.000, I^2=78.6%). Balance training (24 RCTs, 2,439 participants) also statistically improved TUG performance (MD=-0.85, 95%-CI -1.23; -0.46, p<0.000, I^2=83.5%), yet cognitive stimulation (7 RCTs, 554 participants) showed no significant effect when compared to controls (MD=-0.27, 95%-CI -0.80; 0.26, p=0.316, I^2=61.9%).

CONCLUSION: This review found that muscle strengthening and balance interventions may reduce falls in healthy older adults, but cognitive stimulation lacks convincing support. Inconsistent outcome reporting, heterogeneous interventions, and limited long-term follow-up diminish definitive conclusions. Future research should investigate whether observed effects persist over time or require continuous intervention.

Abstract/Poster #: 168
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Clinical Resident

Emily Reeson, MD
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BACKSIDE CORROSION IN MODULAR DUAL MOBILITY MANAGED WITH MODULAR COMPONENT EXCHANGE: AN OLD SCHOOL SOLUTION FOR A CONTEMPORARY PROBLEM

INTRODUCTION: Modular dual mobility (MDM) constructs are increasingly used in total hip arthroplasty (THA) to enhance stability. Despite advantages, MDM carries risk of corrosion at the cobalt-chromium liner-titanium shell interface. Micromotion can cause adverse local tissue reaction (ALTR), bone loss, and component loosening, resulting in THA failure. Addressing corrosion while minimizing bone loss is challenging. We present a case of MDM taper corrosion treated by a straightforward revision strategy to eliminate corrosion sources while retaining well-fixed femoral and acetabular components.

CASE PRESENTATION: 70-year-old male with left primary THA (2019) for osteoarthritis presented in October 2024 with three months of severe groin pain, weakness, and debilitation requiring assistive device for ambulation. Exam revealed Trendelenburg gait, positive Stinchfield test, and restricted hip motion. Metal ion levels were elevated: cobalt 1.09 µg/L, chromium 0.5 µg/L. Components included Styker MDM with Trident 2 66mm Titanium shell, CoCr liner, 52 head with 28 +8 inner CoCr head. Radiographs and MRI exhibited greater trochanter osteolysis and peritrochanteric fluid collection with moderate abductor destruction. Infection workup was negative. Revision THA was performed in July 2025 for ALTR in setting of taper corrosion. Extensive pseudotumor tissue and fluid were excised. Necrotic abductor musculature was debrided. Corrosion was evident at the trunnion taper and MDM liner-acetabular shell junction. Soft tissue surrounding the acetabular component and femoral stem was debrided. The femoral stem and acetabular cup were both well fixed in proper positions. After trialing, Trident II neutral size 44 polyethylene liner was placed, V40 titanium sleeve was applied to the trunnion, and Biolox delta bipolar +4 ceramic head with size 44 outer head was assembled and impacted onto the trunnion. The hip was relocated, leg lengths matched preoperative assessment, and stability was confirmed. Patient was weight bearing as tolerated with 6 weeks of posterior hip precautions. Postoperative recovery was uneventful. Patient reported minimal pain and demonstrated no instability on follow-up. Radiographs confirmed stable implants.

CONCLUSION: When modular component exchange is possible, conversion to a bipolar construct offers a promising, low morbidity revision option to address taper corrosion and preserve well-fixed components in the setting of MDM corrosion.

Abstract/Poster #: 169
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

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FEMORAL COMPONENT OSSEOINTEGRATION VARIES WITH POLYETHYLENE LINER CONSTRAINT IN CEMENTLESS TOTAL KNEE ARTHROPLASTY

INTRODUCTION: Cementless total knee arthroplasty (TKA) is gaining popularity, offering potential for increased implant longevity in younger, active patients. The corresponding polyethylene (PE) bearing insert offers varying degrees of constraint, low-level (cruciate retaining, CR), mid-level (conforming/stabilized liners, CS) and high levels (posterior stabilized, PS) liners to assist in knee stability and improve knee kinematics. We hypothesize that increasing levels of constraint from the various geometries of the inserts introduce secondary loads at the articulation, resulting in micromotion at the bone interface, inhibiting bone ongrowth.

METHODS: A cohort of 18 cementless femoral TKA implants was selected: 6 CR implants, 6 CS implants, and 6 PS implants. The femoral components were sectioned using a cut-off machine into five flat segments, which were imaged with a digital microscope. Area of bone ongrowth was assessed with Image J software). Group comparisons were performed using Mann-Whitney U, Kruskal-Wallis, and Spearman tests.

RESULTS: Across all components, the median (range) percent area of bone ongrowth was 54.4% (15.2, 82.4). By group, bone ongrowth was CR = 61.5% (42.9, 72.9), CS = 38.6% (29.9, 46.7), and PS = 69.9% (15.2, 82.4). The CR group had more bone ongrowth compared to the CS group ($p = 0.034$). There was a trend of more observed bone ongrowth on the medial condylar sections compared to the lateral side (46.3% (7.4, 84.8) and 41.6% (3.7, 78.9), respectively) which was also observed within each cohort. For the entire cohort, the results indicate a higher level of bone ongrowth on the anterior portions, 64.2% (4.9, 99.7), than the posterior condylar portions, 23.2% (0.7, 86.8).

CONCLUSION: The results demonstrated more bone ongrowth in the CR compared to the CS group, thus partially confirming our hypothesis. The PS group exhibited broad variability, and no difference was observed in comparison to the other groups. The lower area of bone ongrowth on the lateral side for the PS and CS group may result from larger micromotion at the interface due to larger lateral motion trajectories and higher loads at the medial surface. Limitations include: small cohort size, and other confounding (e.g. BMI, activity level) could not be considered.

Abstract/Poster #: 170
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

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PERFORMANCE OUTCOMES AFTER ULNAR COLLATERAL LIGAMENT TEARS IN MAJOR LEAGUE BASEBALL PITCHERS

INTRODUCTION: Ulnar collateral ligament (UCL) injuries remain a major challenge for Major League Baseball (MLB) pitchers, with implications for performance, career longevity, and financial stability. Although prior studies have examined return-to-play (RTP) after UCL reconstruction, the combined effects on league-adjusted performance and individual salary trajectories remain unclear. This study integrates performance analytics with economic data to create a comprehensive evaluation of post-injury career outcomes among MLB pitchers.

METHODS: A retrospective cohort of MLB pitchers who underwent UCL reconstruction between 2000 and 2024 was assembled using publicly available performance, salary, and transactional sources. Pre- and post-injury pitching metrics were normalized to MLB-wide averages for corresponding seasons to account for changes in league scoring environments. Within-player differences in earned run average (ERA), fielding independent pitching (FIP), walks plus hits per inning pitched (WHIP), and wins above replacement (WAR) were calculated using a difference-in-differences approach. Salary changes were evaluated using log-transformed values adjusted for league-wide inflation. Multivariable regression models identified predictors of RTP, performance change, and post-injury salary.

RESULTS: Among 277 pitchers identified, 85% returned to MLB competition following surgery. League-adjusted performance declined across all measured pitching metrics, demonstrating persistent reductions in effectiveness after recovery. In contrast, salaries increased relative to MLB-wide norms. Greater MLB service time prior to injury, higher pre-injury WAR, and holding a multiyear contract were independently associated with higher post-injury salary. Multiyear contract holders also showed higher RTP likelihood. Age at injury, pitching handedness, and timing of injury (in-season versus off-season) were not significant predictors of RTP or performance change.

CONCLUSION: While most MLB pitchers return to play after UCL reconstruction, they exhibit measurable performance decline even when accounting for shifting league conditions. Despite this, salary trajectories remain favorable, shaped primarily by pre-injury career standing and contractual security rather than on-field production after recovery. These findings highlight the importance of incorporating both economic and performance outcomes when counseling players, making roster decisions, and negotiating contracts. A combined analytic approach provides a clearer framework for understanding post-injury career pathways and may guide expectations for rehabilitation, player development, and long-term planning.

Abstract/Poster #: 171
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

Joshua Samaniego, MS, BS
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MULTIDOMAIN STATISTICAL SHAPE MODELING TO EVALUATE ANATOMIC VARIATIONS UNDERLYING THE J-SIGN IN PATELLOFEMORAL INSTABILITY

INTRODUCTION: Patellofemoral instability (PFI) commonly affects young, active individuals, presenting with recurrent lateral dislocations and patellar maltracking. J-sign, a lateral patellar excursion during knee extension, is a key clinical marker, graded from 1 to 4, with higher grades linked to worse function and outcomes after medial patellofemoral ligament (MPFL) reconstruction to treat PFI. Although factors such as trochlear dysplasia, patella alta, and tibial tubercle lateralization are known to contribute to instability, it remains unclear how 3D knee morphology relates to J-sign severity. Statistical Shape Modeling (SSM) presents an opportunity to quantitatively evaluate 3D shape variations. This study applies SSM to assess femoral, tibial, and patellar morphology and alignment across J-sign severity groups. We hypothesize that trochlear bump height, patella lateralization, and tibial tubercle position are primary drivers ofincreasing J-sign severity.

METHODS: Twenty-two PFI patients were categorized into 5 groups: controls without instability(n=4), no J-sign(n=5), 1-quadrant(n=7), 2-quadrant gradual(n=5), and 2(+)-quadrant jumping(n=5). MRI-derived 3D models of the femur, tibia, and patella were segmented in 3D Slicer and analyzed using ShapeWorks. A multidomain model was generated using 4096 particles for the femur and tibia and 1024 for the patella. Procrustes scaling minimized size effects. Linear discriminant analysis evaluated group differences.

RESULTS: Increasing J-sign severity was associated with progressively greater lateral patellar displacement. Trochlear morphology differed, with average sulcus angles increasing across groups: 172.33° (no J-sign), 179.85° (1-quadrant), 183.76° (2-quadrant gradual), and 191.58° (2(+)-quadrant). Both higher-grade groups demonstrated a trochlear bump (sulcus angle >180°), consistent with severe dysplasia. Tibial tubercle lateralization measured 67.22mm (no J-sign), 71.23mm (1-quadrant), 70.02mm (2-quadrant gradual), and 70.64mm across groups (2(+)-quadrant). Knee rotation angles greatly between no J-sign versus the J-sign groups: -5.03° (no J-sign), 4.75° (1-quadrant), 4.22° (2-quadrant gradual), and 2.81° (2(+)-quadrant).

CONCLUSION: Higher J-sign severity is associated with increased patellar lateralization and trochlear dysplasia. The 1-quadrant group exhibited the greatest tibial tubercle lateralization and knee rotation, suggesting an alignment-driven mechanism differing from the morphology-driven pattern seen in higher-severity groups. These findings highlight distinct anatomical phenotypes underlying dynamic maltracking. SSM provides valuable 3D characterization that may guide individualized surgical decision-making, though larger studies and weight-bearing imaging are needed.

Abstract/Poster #: 172
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: 2025 Summer Research Program

Sebastian Scofield, BS
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COMPARATIVE HIGH-FIDELITY SEGMENTATION OF KNEE JOINT STRUCTURES INCLUDING SOFT TISSUES USING DESS VERSUS T1 VIBE FLASH MRI SEQUENCES

INTRODUCTION: High-fidelity segmentation of soft tissue knee joint structures - including tibial, femoral, and patellar cartilage, menisci, and cruciate ligaments - remains a manual, labor-intensive process. MRI sequence selection plays a critical role in visualization. This study compares the tissue structure delineation of Dual Echo Steady State (DESS) vs. T1 VIBE Fast Low Angle Shot (FLASH) MRI sequences for segmenting intra-articular structures in human subjects. DESS is commonly favored for its sensitivity in detecting cartilage defects due to superior fluid-cartilage contrast. However, its segmentation utility may vary depending on the anatomical target and research question.

METHODS: Three healthy knees (2 male, 1 female) were scanned via a 3T MRI using DESS and T1 VIBE FLASH sequences. DICOM files were uploaded to 3D Slicer, and pixel/voxel resolution was standardized to an oversampling factor of 1.5. High-fidelity segmentation was performed in sagittal views, followed by manual refinement in coronal and transverse planes. Each structure underwent joint smoothing (0.75), iterative manual correction, and a second smoothing pass (0.75) to optimize surface continuity and anatomical fidelity.

RESULTS: FLASH provided improved contrast at the cartilage-bone interface, while DESS excelled in delineating cartilage contact interfaces, particularly at tibiofemoral boundaries. Meniscal structures segmented more distinctly on DESS. For ligament segmentation, the PCL was more consistently visualized than the ACL across both sequences, though both posed challenges in precise boundary identification during segmentation regardless of MRI sequence.

CONCLUSION: While DESS remains the standard for cartilage assessment, FLASH may offer advantages in research settings requiring precise bone and cartilage segmentation, whereas DESS retains strengths in highlighting subtle interface transitions and pathological cartilage features. ACL visualization is particularly difficult due to its two functional bundles (anteromedial and posterolateral). High-fidelity ACL segmentation may improve with dedicated MRI knee positioning, which was not used here. These findings support further exploration of FLASH-based workflows in orthopedic research and underscores the need to tailor MRI sequence selection to the intended application.

Abstract/Poster #: 173
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

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EARLY EXPOSURE TO MATERNAL DOLUTEGRAVIR-BASED ART IMPACTS FAT AND BONE HEALTH IN MICE AND RATS

INTRODUCTION: HIV-exposed but uninfected (HEU) children experience higher rates of co-morbidities. Pregnant women with HIV are primarily prescribed dolutegravir (DTG) , which crosses the placenta and is detected in breast milk and infant plasma. While DTG use is associated with bone mass loss and fat accumulation in adults living with HIV, the long-term effects of DTG-based ART on bone and fat development in HEU remains unknown. We hypothesized that in utero and lactational exposure to DTG-based ART would reduce bone mass and increase weight in rat and mice models.

METHODS: Time-mated female Harlan Sprague Dawley rats (10-13 weeks) and C57BL/6J mice (8-10 weeks) received clinically relevant DTG/ Abacavir (ABC)/ Lamivudine (3TC) and DTG/tenofovir disoproxil fumarate (TDF)/3TC or with vehicle, respectively. Rats were treated via oral gavage from gestational day (GD) 6 to postnatal day (PND) 28 and mice received drug infused pellets from GD9 to PND 28. Animals from both experiments were weighed weekly to analyze weight gain. Rat femurs and visceral adipose tissue (VAT) were analyzed at postnatal day (PND) 573 for microcomputed tomography and RNA-sequencing. Mice VAT were assessed by qPCR and circulating leptin and adiponectin were measured via ELISA at PND 28. Bone mineral density (BMD) were assessed by DXA at PND36 and 50.

RESULTS: Maternal exposure to DTG-based ART led to increased weights in rats (males $p=0.081$, females $p=0.03$) and mice (males $p=0.03$, females $p=0.07$). ART exposed male rats showed a 3.4% increase in the femoral length ($p=0.002$), with no significant changes in trabecular architecture or cortical geometry. VAT from ART treated mice revealed significantly elevated cytokine-receptor interaction and chemokine signaling pathways in treated vs control rats (FDR < 0.05). Maternal ART exposure led to elevated BMD at PND50 in mice (males $p=0.007$, females $p=0.004$). Male mice showed significantly elevated serum adiponectin ($p=0.02$) with a trend toward increasing circulating leptin in both sexes following ART treatment. Elevated leptin and PPARg expression were also observed in VAT in ART-treated mice.

CONCLUSION: Our data indicates that DTG-based ART exposure during early development influences bone growth and adipose tissue development.

Abstract/Poster #: 174
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: 2025 Summer Research Program

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IMPACT OF STAIN NORMALIZATION ON DEEP LEARNING FOR KNEE OSTEOARTHRITIS SCORING

INTRODUCTION: Knee Osteoarthritis (OA) is an age-related joint disease characterized by cartilage break down, pain, and reduced mobility. Knee OA severity is often described via manual scoring of histological images of cartilage and bone at the joint surface. However, manual scoring is time consuming and varies between human graders. Deep learning provides a scalable, reproducible alternative to manual grading. Since stained tissue sections often differ in color intensity and consistency due to different staining procedures and batch-to-batch differences, stain normalization is often applied to imaged slides to keep a consistent color profile across all images. The purpose of this study was to evaluate how stain normalization methods affect the accuracy of a deep learning model for automated knee OA scoring in a pre-clinical model.

METHODS: A pre-trained convolutional neural network (ResNet-18) was fine-tuned for processing histological images of mice (N=53) from models of age-associated spontaneous knee OA (6 months: N=10M/6F; 20 months: N=14M/6F) and injury-induced knee OA (partial meniscectomy, PMX; destabilization of medical meniscus, DMM) (PMX+13 weeks: N=5M/5F, sham+13 weeks: N=4M/5F). Digitized H&E-stained sections (N=53) were labeled with knee OA scores assessed using a modified OARSI score [1] and preprocessed for deep learning via resizing and scaling. Four separate models were trained (80:20 training/testing split, MSE loss) after additionally preprocessing using the following stain normalization methods: Macenko, Reinhard, Vahadane, and raw (not normalized). F1 scores (macro, weighted) were used to measure model performance.

RESULTS: Four ResNet-18 models were successfully trained, demonstrating decreased loss and convergence. Models trained on Reinhard-normalized images yielded the best results (macro F1 = 0.969, weighted F1 = 0.980), while Macenko (macro F1= 0.658, weighted F1 = 0.838), Vahadane (macro F1=0.609, weighted F1 = 0.805), and raw (macro F1= 0.643, weighted F1 = 0.857) models performed similarly.

CONCLUSIONS: We established the preliminary feasibility of deep learning to classify knee OA severity in histology images. Model accuracy was significantly improved after using stain normalization to reduce variability. We surmise that with more data a robust model can be developed to improve objectivity and throughput in pre-clinical OA research. REFERENCES: 1) Miller et al. Osteoarthritis Cartilage 2016

Abstract/Poster #: 175
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

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WHAT IS THE SAFE STARTING POINT AND BURR DEPTH FOR ROBOT-ASSISTED PEDICLE SCREW PLACEMENT? AN ANATOMIC CT-BASED STUDY ON 1,000 PEDICLES

INTRODUCTION: Navigated robot-assisted spine surgery achieves high pedicle screw accuracy, but screw-related complications can still occur, particularly during burr use, due to frameshift or angulation errors. No prior study has defined a safe burr depth or optimal starting point in robot-assisted cases. This study aimed to determine burr depth safety limits in lumbar pedicle screw trajectories and evaluate whether a lateral starting point permits greater safe depth compared to the ideal entry.

METHODS: CT scans from 100 lumbar fusion patients (1000 pedicles, L1-L5) were analyzed. Two entry points were assessed: (1) the ideal point at the intersection of the mid-pedicle (sagittal) and mid-transverse process (coronal); and (2) a lateral point, 2 mm lateral to the ideal. Measurements were performed with and without simulated facetectomy, estimating facet removal from the transverse process-superior articular process junction. Measurements (with and without simulated facetectomy) included pedicle isthmus, distances to ventral lamina/medial pedicle wall/mid-pedicle, trajectory angulation error, 2mm frameshift error, burr depth distances from 0 to 3cm, and a 3mm burr width.

RESULTS: The mean mid-pedicle-to-medial wall distance was 4.6 ± 1.9 mm (L1-L5 range: 3.2-6.5 mm). For native facets, shortest ventral lamina distances were 18.4 ± 3.4 mm (ideal) and 19.2 ± 3.0 mm (lateral). With a 2 mm medial frameshift, violation risk was 0% at 1 cm burr depth for both ideal and lateral trajectories, increasing to 1.2% and 0.4% at 1.5 cm, and 12.7% and 8.7% at 2 cm, respectively. Following facetectomy, shortest ventral lamina distances were 12.8 ± 4.3 mm (ideal) and 14 ± 3.0 mm (lateral). Violation risk was 0% at 0.5 cm for both ideal and lateral trajectories, increasing to 0.7% vs 0.3% at 1.0 cm, and 7.8% vs 3.5% at 1.2 cm, respectively.

CONCLUSION: A 2 mm lateral starting point reduces medial breach risk in robot-assisted lumbar cases. Safe burr depths: ≤1.5 cm (no facetectomy) or ≤1.0 cm (with facetectomy). These findings are particularly useful for upper lumbar pedicle screw placement and in cases with small or dysplastic pedicle morphology but must be balanced with the risk of skive and lateral breach.

Abstract/Poster #: 176
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

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EVALUATION OF THIN-WALLED ACETABULAR LINER WEAR IN TOTAL HIP ARTHROPLASTY USING RADIOGRAPHIC AND CMM METHODS

INTRODUCTION: Thin-walled acetabular liners made from highly-crosslinked polyethylene (HXLPE) are increasingly used in total hip arthroplasty to allow larger femoral heads, but long-term wear remains a concern. Radiographic assessments, applicable in clinical practice, are limited by projection variability and geometric assumptions. Coordinate-measuring-machine (CMM) scanning provides precise three-dimensional measurements of volumetric and linear wear, yet comparisons with radiographic methods are limited. This study evaluates in vivo wear in retrieved thin-walled HXLPE liners and compares radiographic penetration with CMM measurements to assess accuracy and clinical utility.

METHODS: Initially, 283 surgically retrieved thin-walled liners were screened. Liners were excluded if they were implanted for <3 years or exhibited excessive removal damage, good quality radiographs (post-op and close to revision) were not available leaving 31 liners eligible for wear analysis. Radiographic wear was measured analogously to the Martell method, while volumetric and linear wear were quantified using an optical CMM and digital reconstruction, serving as the reference standard.

RESULTS: While all 31 liners were scanned with the CMM, digital reconstruction was only possible for three liners. For the others, plastic deformation from patient activity or removal made it impossible to fit a sphere accurately to the visibly undamaged areas. The average CMM-derived volumetric wear was 54.0 ± 29.0 mm^3. Linear penetration measured by CMM demonstrated substantial variability when compared with radiographic measurements. For Liner 1, CMM wear measured 168.4 µm, whereas radiographic assessment overestimated wear at 429 µm. Liner 2 had 72 µm wear measured by CMM and 97.3 µm radiographically. In contrast, Liner 3 demonstrated marked radiographic underestimation, with 146 µm measured by CMM and only 28.5 µm detected radiographically. Across all cases, radiographs differed from CMM by an average of 56 µm.

CONCLUSION: Wear could only be accurately assessed via CMM for 10% of liners, compared to 65% in a previous study of liners with thicker walls. Radiographic measurements showed inconsistent agreement with CMM-derived linear penetration, with both overestimation and underestimation observed across cases. These results indicate that radiographs may be unreliable for quantifying wear in thin-walled HXLPE liners, and CMM can only be used for a small subset of retrieved liners.

Abstract/Poster #: 177
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

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HYALURONAN SIZE DETERMINATION IN SERUM AND SYNOVIAL FLUIDS AS AN INDICATOR OF JOINT INFLAMMATION IN A RAT MODEL OF IMPLANT LOOSENING

INTRODUCTION: Hyaluronan (HA) is synthesized as a large polysaccharide (>106 kD) at the cell membrane by hyaluronan synthases from glucose-derived UDP-sugars. It is a structural component of joint tissues and in synovial fluid it contributes to joint lubrication. HA undergoes metabolic turnover by hyaluronidases, resulting in smaller fragments (104-5Kd) which can activate macrophages and diffuse via interstitial fluid into the circulation. HA turnover is increased by tissue injuries and inflammation, including in joint diseases. Analyses of total HA in sera of patients with rheumatoid arthritis or aseptic implant loosening show elevated serum HA compared to healthy individuals, but no size analyses was performed. Here, we aim to quantify size ranges of HA in serum and synovial fluid as an indicator of joint inflammation associated with implant loosening. We will apply established agarose gel electrophoretic methods for HA sizing and analyze sera and synovial fluid samples collected from a rat model of implant loosing.

METHODS: Bilateral intrafemoral implants were placed in male Sprague-Dawley rats and treated weekly with intra-articular injection of cobalt-chromium (CoCr) particles or vehicle (PBS) for 6 weeks. Sera were prepared from weekly tail vein bleeds, digested with proteinaseK and HA isolated by ethanol precipitation steps. Synovial fluids were obtained by joint lavage after sacrifice and HA purified as above. HA samples and commercial HA MWT standards were dissolved in 25µl of loading buffer (10µl of dH2O in 3 µl of 0.02% bromophenol blue and 2M sucrose in TBE) and electrophoresed on agarose gels. HA banding was detected by StainsAll, imaged with an iBright system and quantitated by Image J.

RESULTS: Serum levels of HA and its fragments will be transiently elevated in the vehicle only group during a post-surgical recovery period but stay elevated in the chronically inflamed CoCr group. We anticipate increased levels of intact and HA fragments in synovial fluid of the chronically inflamed CoCr group compared to either naïve or vehicle groups.

CONCLUSION: The restults would provide data for potential application of analytical method to sera and synovial aspirates from patients to monitor chronic joint inflammation accompanying implant loosening.

Abstract/Poster #: 178
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

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ASTROCYTIC UPTAKE OF COBALT AND TITANIUM DEBRIS FROM TJA IMPLANTS DRIVES MITOCHONDRIAL RESPIRATORY SHUTDOWN, LEADING TO CELLULAR ENERGY DEPRIVATION

INTRODUCTION:: Total joint arthroplasty (TJA) is an end-stage treatment for osteoarthritis, where damaged joints are replaced by metal, plastic, or ceramic implants. Common implant metals include CoCrMo and TiAlV, which can disseminate systemically and accumulate in tissues. Postmortem studies report plasma Co levels of 1-5 µg/L and CSF levels of 0.2-1 µg/L in patients with implants. Co binds to iron- and calcium-sensitive sites, disrupting mitochondrial function, glycolysis, and inducing inflammation. Ti, released as stable nanoscale debris, is taken up by phagocytic cells but shows minimal neurotoxicity at low levels. Yet, the cellular and functional effects of implant-derived metals on brain cells are still not well understood.

METHODS: To evaluate the effects of implant alloys on brain cells, we exposed human iPSC-derived astrocytes, neurons, and microglia to Co and Ti alloy particles (50-100 particles/cell) for 24 hours and 6 days. We assessed how these metals affected cell toxicity, as well as morphological, physiological, and functional changes using live imaging, immunofluorescence, flow cytometry, RNA sequencing analysis, seahorse assays, and gene expression analysis.

RESULTS: Neither Co nor Ti at 200 particles/cell caused toxicity in astrocytes or neurons. Astrocytes internalized metal debris, confirmed by live imaging and SEM, with increased phagocytic activity and marked morphological changes. At 50 particles/cell, both metals significantly impaired astrocytic respiration, revealed by Seahorse assays. Co-exposure induced broad transcriptional shifts, including upregulation of glycolytic and ATP-production, revealed by RNA-seq analysis. Neurons exposed to Co showed axonal and dendritic injury with reduced PSD95 and synapsin, while Ti had no adverse effects. A 90-minute low-dose exposure to either metal triggered strong c-Fos induction, indicating an early stress response.

CONCLUSIONS: Co particles cause pronounced astrocytic dysfunction, impairing respiratory capacity and driving glycolytic reprogramming, despite no detectable cytotoxicity. In neurons, Co, but not Ti, induces dendritic and axonal damage with reduced PSD95 and synapsin expression, consistent with early neurodegenerative changes without causing cell death. Ti particles have minimal structural or metabolic impact on either cell type under the conditions tested. Robust c-Fos induction after brief exposure to Co or Ti indicates that neurons rapidly sense and respond to implant-derived metals even at non-toxic doses.

Abstract/Poster #: 179
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: M2

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MAGNETIC RESONANCE IMAGING AND CLINICAL OUTCOMES AFTER MODIFIED RECESSION WEDGE TROCHLEOPLASTY

INTRODUCTION: This study evaluated the safety and healing of modified recession wedge trochleoplasty with concomitant stabilization procedures including medial patellofemoral ligament (MPFL) reconstruction and possible osteotomies as evaluated by MRI measurements. We also assessed for associations between MRI measurements and patient-reported outcome scores (PROs) up to 2 years in patients with available PRO data.

METHODS: This is a retrospective review of patients who underwent modified recession wedge trochleoplasty with MPFL reconstruction at a single institution from 2020 to 2024 with preoperative and postoperative knee MRI scans. Patient characteristics and Kujala PROs at 6 months, 1 year, and 2 years were analyzed.

RESULTS: 16 patients (18 knees) met the criteria. Preoperative sulcus angle averaged 149°. Multiple MRI measurements demonstrated a significant difference in their mean at 6 months, and were maintained at 1 year: Bump height bone, Bump height cartilage, TT-TG, sTT-TG. Lateral and central trochlear height regressed to normal by 1 year. PROs improved significantly from preoperative to 6 months ($p<0.001$), 1 year ($p<0.001$), and 2 years ($p<0.05$). Preoperative lateral trochlear height was negatively correlated with Kujala scores at both 1 year and 2 years, indicating that greater trochlear height was associated with worse functional outcomes.

CONCLUSION: Modified recession wedge trochleoplasty with MPFL reconstruction and stabilization procedures demonstrates significant improvements in both patellofemoral joint morphology and patient-reported outcomes. This approach offers a safe, effective treatment for patellofemoral instability, with promising results in both primary and revision cases. Results maintained a decrease in several trochlear dysplasia parameters, including bump height of the proximal trochlea and the magnitude of sagittal (sTT-TG) and coronal malalignment (TT-TG) of the patellofemoral joint. PRO data suggest that patients experienced an initial period of recovery by 6 months, followed by significant improvements in outcomes by 1 year, which was maintained at 2 years. Few MRI measurements of trochlear dysplasia are correlated with PRO outcomes in isolation, highlighting the complex interplay of joint morphology and alignment parameters on influencing joint functionality. Changes in trochlear height and depth were associated with PROs outcomes, supporting the use of MRI as a valuable tool in surgical planning and post-operative assessment.

Abstract/Poster #: 180
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: RMC: DTS

Marcus Winogradzki, BS
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TUBULIN B2a: A NOVEL REGULATOR OF OSTEOBLAST DIFFERENTIATION AND BONE FORMATION

INTRODUCTION: Osteoblasts are essential for bone formation, secreting proteins that drive extracellular matrix production and mineralization. Microtubules support these processes by meditating vesicular trafficking of matrix components and signaling molecules. Their function is shaped in part by the specific tubulin isotypes incorporated into their microtubule lattice. Our preliminary data revealed an isotype switch during osteoblast differentiation that favors tubulin β2a over β3. This study investigates the role of tubulin β2a in osteoblast differentiation and bone development using both in-vitro and in-vivo models. Understanding how distinct tubulin isotypes influences osteoblast function may uncover new therapeutic strategies to enhance bone formation and treat skeletal diseases such as osteoporosis.

METHODS: The role of tubulin β2a was examined using both in-vitro and in-vivo approaches. In-vitro, a CRISPR-Cas9 Tubb2a knockout was generated in IDG-SW3 cells, and differentiation was assessed by Alizarin Red staining and osteogenic gene profiling. In-vivo, a global Tubb2a knockout in C57BL/6J mice was evaluated across key stages of skeletal maturation, including adolescent bone accrual at 6 weeks and adult bone regeneration following bone marrow ablation at 16 weeks. Both stages were analyzed using micro-CT, histology, and serum ELISA.

RESULTS: Tubulin β2a knockout impaired in-vitro osteoblast differentiation, evidenced by a failure to mineralize and reduced expression of osteocyte markers Dmp1 and Sost. While early extracellular matrix production was unchanged, Alpl expression was markedly reduced. Additional analyses revealed impaired TGF-β signaling. In-vivo, β2a loss produced subtler but notable sex-specific effects on adolescent bone accrual: at 6 weeks, males exhibited lower trabecular BV/TV and reduced serum P1NP, whereas surprisingly females showed the opposite pattern. Following bone marrow ablation in adult mice, both sexes exhibited decreased trabecular bone regeneration.

CONCLUSIONS: Our findings reveal a novel role for tubulin β2a in regulating osteoblast differentiation and bone formation. In-vitro, β2a deficiency impaired mineralization, whereas in-vivo, its loss produced subtler effects that suggest reduced regenerative capacity and sex-specific differences in bone accrual. These results highlight that distinct microtubule isotypes contribute functionally to skeletal biology. Ongoing work will focus on defining β2a-dependent mechanisms that may be leveraged to develop new strategies for enhancing bone repair and treating skeletal disease.

Abstract/Poster #: 181
Session: Poster Presentation
Theme: Musculoskeletal Research and Orthopedics
Trainee Rank: Post-Doctoral Research Fellow

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BIOKINETIC PROFILES IN SINGLE-LEG HORIZONTAL LANDING AFTER ACL RECONSTRUCTION: AN ARTIFICIAL INTELLIGENCE-DRIVEN BIOMECHANICAL CLASSIFICATION FOR RETURN-TO-SPORTS.

INTRODUCTION: Return-to-sports (RTS) criteria after anterior cruciate ligament reconstruction (ACLR) usually focus on strength, patient-reported outcomes, and hop distance, but fail to predict outcomes accurately. Biomechanics are increasingly used to determine RTS readiness and reinjury risk. However, there is no classification that can help with RTS assessment. This study aimed to create a biomechanics-based classification using artificial intelligence to improve the RTS evaluation.

METHODS: Forty-four physically active subjects, 7-9 months post-ACLR, performed a single-leg horizontal hop test. Kinematics were collected using an 8-camera motion analysis system with reflective markers. Participants also completed isometric hip and knee strength tests, the International Knee Documentation Committee (IKDC) questionnaire, and the visual analogue scale for pain. Profiles were identified using principal component analysis to extract variables from the landing phase, followed by self-organizing maps and k-means clustering. Profiles were compared using the Kruskal-Wallis test (α=0.05). Differences were considered significant when having large effect sizes (Cohen's d > 0.8).

RESULTS: Four profiles were identified. Profile 1 (Dynamic Valgus): good hop performance (63.4 %Ht [percentage of height) and high IKDC scores, but presented a quadriceps-dominant strategy and knee valgus (2.2°) at landing, suggesting reinjury risk and the need for neuromuscular training. Profile 2 (Return to Play): good hop performance (64.3 %Ht), adequate knee flexion (48.7°) and trunk flexion (31.1°), with excellent pelvic and hip control, the highest muscle strength, and mild/no pain. Biomechanically ready for RTS, dependent on pain management. Profile 3 (Weak Group): adequate hop performance (59.6 %Ht), but with hip and knee weakness, moderate IKDC scores, and compensatory landing mechanics such as hip abduction (2.2°) and knee varus (3.6°) and internal rotation (-4.2°). Likely requires targeted strength training. Profile 4 (Low Performance): worst hop performance (45.3 %Ht), minimal knee (34.8°) and trunk flexion (17.1°), increased hip adduction (4.4°) and knee varus (3.4°), weak extensors, and potential kinesiophobia. Indicates poor readiness to return to play, highlighting the need to address both physical and psychological barriers.

CONCLUSION: Machine learning identified four distinct landing strategies in ACLR patients, providing a biomechanical classification to assist RTS decisions. Biokinetic profiling may optimize RTS assessment and enable personalized rehabilitation strategies, potentially reducing reinjury risk.

Abstract/Poster #: 182
Session: Poster Presentation
Theme: Neurodegenerative Diseases and Inflammation
Trainee Rank: RMC: DTS

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PROTEOMIC CHARACTERIZATION OF AMYLOID BETA PEPTIDE VARIANTS REVEALS UNQIUE PROTEIN INTERACTOME OF PYROGLUTAMATE AMYLOID BETA IN ALZHEIMER'S DISEASE HUMAN HIPPOCAMPUS

INTRODUCTION: Amyloid plaques are a hallmark neuropathological feature of Alzheimer's disease (AD) and primarily consist of insoluble forms of amyloid beta (Aβ) peptide. Aβ peptides can undergo post-translational modifications that alter their biophysical properties, influencing aggregation and toxicity, highlighting the critical need for understanding how these different peptides affect AD pathology. Pyroglutamate-modified Aβ (pEAβ) has been identified as a key factor and immunotherapeutic target in AD pathogenesis due to its role in early seeding of plaques, increased aggregation propensity, and increased toxicity. This study aims to investigate two different forms of Aβ, including pEAβ as well as unmodified Aβ (pan Aβ), by defining the protein-protein interactions (interactome) and molecular processes involved in AD pathogenesis.

METHODS: Hippocampal tissue was obtained from the Arizona Study of Aging and Neurodegenerative Disease (AZSAND) and consisted of tissue from 5 AD confirmed samples and 5 cognitively normal (CN) samples. Samples were assigned into four groups: pEAβ, pEAβ no primary, pan-Aβ, and pan-Aβ no primary. Protein interactomes were mapped using biotinylation by antibody recognition (BAR), a proximity approach optimized for insoluble protein complexes. Following antigen retrieval, samples were incubated with pEAβ or pan-Aβ antibodies, followed by biotin-tyramide deposition. Biotinylated proteins were extracted, purified, and identified by LC-MS/MS, and differentially enriched proteins were quantified. Aβ pathology and antibody specificity were validated via immunohistochemistry and confocal imaging.

RESULTS: AD samples exhibited robust plaque pathology, while CN samples showed little to no plaque deposition. In AD, 48 proteins were enriched around pEAβ and 28 around pan-Aβ. Both variants localized to synaptic and membrane-related proteins, but their impacts diverge as they interact with different proteins. In CN tissue, 15 proteins were enriched around pan-Aβ, with none around pEAβ. Pan-Aβ in CN tissue captured pathways reflecting physiological and early Aβ interactions. In contrast, pEAβ in AD drove a distinct pathogenic interactome, consistent with its heightened aggregation and persistence within synaptic compartments.

CONCLUSION: A unique protein interactome specific to pEAβ was identified, positioning pEAβ as a pathogenic hub linking synaptic and metabolic dysfunction in AD. In future studies, we aim to verify this data using imaging and biochemical approaches.

Abstract/Poster #: 183
Session: Poster Presentation
Theme: Neurodegenerative Diseases and Inflammation
Trainee Rank: RMC: M2

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THE ROLE OF THE SPLEEN IN THE NEUROINFLAMMATORY RESPONSE FOLLOWING SPINAL CORD INJURY

INTRODUCTION: The chronic neuroinflammatory response that follows spinal cord injury (SCI) has the capacity to worsen functional outcomes and to negatively impact quality of life, rendering it a promising target for therapeutic intervention. Current evidence indicates a complex and critical role for the spleen in influencing the neuroinflammatory response following central nervous system (CNS) injury. However, few studies have specifically addressed this relationship following SCI, making it an important avenue for further investigation. Such information may be critical to improve the field's understanding of the spleen's influence in the acute stage of SCI by quantifying spinal cord inflammation in mice receiving splenectomies prior to SCI, following SCI, or not at all.

METHODS: Female C57BL/6 mice, between the ages of 8-12 weeks, were randomly assigned to splenectomy groups performed at various time points before or after T9 spinal cord injury (SCI), or to no-splenectomy and uninjured control groups. Splenectomies followed standardized procedures in mice. Surgical SCI included a laminectomy at the T9 level, followed by a bilateral spinal cord contusion administered using a 50-kilodyne contusion. All mice were sacrificed 7 days after SCI procedure. Spleen mass and spleen-to-body-mass ratio (SBMR) were quantified. Spinal cord tissue centered at T9 was processed for flow cytometric analysis of immune cell infiltration.

RESULTS: Preliminary analyses demonstrate a significant elevation in the SBMR in mice subjected to spinal cord injury 7 days post injury (dpi), relative to uninjured controls ($p = .001$) and injured mice assessed at 1 dpi ($p = .013$). This increase temporally coincides with the onset of macrophage infiltration into the injured spinal cord. Consistent with this observation, prior studies have demonstrated that splenectomy performed prior to T9 contusion injury markedly attenuated the post-injury rise in SBMR. Ongoing flow cytometric profiling will further characterize the immune cell subsets driving this splenic response.

CONCLUSION: Preliminary evidence suggest that spleen-derived leukocytes contribute to the acute myeloid inflammatory response following SCI. These findings highlight the critical role of the spleen in acute post-injury immune dynamics and underscore its potential as a therapeutic target for modulating the initial inflammatory cascade after SCI.

Abstract/Poster #: 184
Session: Poster Presentation
Theme: Neurodegenerative Diseases and Inflammation
Trainee Rank: RMC: DTS

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CHARACTERIZING THE IMMUNE RESPONSE IN SCI TREATED WITH FPLG

INTRODUCTION: Spinal cord injury (SCI) is a devastating condition that affects over 15 million people globally with approximately 17,000 new cases occurring yearly in the United States. Most SCI cases result from trauma such as falls, accidents, and violence. SCI is characterized by a primary mechanical injury followed by a secondary injury cascade involving inflammation, oxidative stress, and apoptosis. Secondary damage is largely driven by overactivation of the immune system. Research into the immune profile following SCI has revealed a complex and dynamic interplay between innate and adaptive immune responses that contribute to both neurodegeneration and repair. Shortly after injury, there is an acute infiltration of neutrophils and macrophages, accompanied by activation of resident microglia, leading to the release of pro-inflammatory cytokines such as TNF-α, IL-1β, and IL-6, which then exacerbate tissue damage. In rodent models, macrophage activity peaks at 7- and 60-days post-injury (dpi), influencing inflammation and tissue repair. Scaffolds made from poly(lactic-co-glycolic) acid (PLG), a bioresorbable polymer, have emerged as a promising strategy for promoting axonal regeneration and modulating inflammation. This study explores the effects of a highly porous form of PLG, Fluffy PLGTM (FPLG) at various timepoints, 2-, 5-, and 7-days post injury, to assess the effects of FPLG.

METHODS: Female wild-type Sprague Dawley rats underwent a bilateral moderate contusion at the ninth thoracic vertebral level (T9) or a laminectomy at the same level. At 1 dpi, a subset of rats underwent a myelotomy at the site of injury (and a subset of those received implantation of FPLG scaffold). At 2-, 5-, and 7- dpi all rats were sacrificed for flow cytometric analysis and immunohistochemistry.

RESULTS: At the more acute timepoints (2 and 5 dpi), experiments did not demonstrate a significant difference in inflammatory cells within the spinal cord. At 7 dpi, however, there was a significant reduction of M1 macrophages in those rats that received FPLG implantation.

CONCLUSION: FPLG scaffolds possibly sequester inflammatory macrophages, preserve spinal cord structure, and induce a sub-acute anti-inflammatory shift at 7 dpi, highlighting FPLG's potential to modulate inflammation and support tissue preservation in SCI.

Abstract/Poster #: 185
Session: Poster Presentation
Theme: Neurodegenerative Diseases and Inflammation
Trainee Rank: RMC: M2

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EVOLVING THALAMOTOMY FOR TREMOR: FROM HISTORICAL LESIONING TO CONTEMPORARY RF, SRS, AND MRGFUS - EFFICACY, SAFETY, AND PRACTICAL SELECTION

INTRODUCTION: Thalamotomy remains an effective therapy for medication-refractory tremor in essential tremor and Parkinson's disease. Multiple lesioning techniques—radiofrequency (RF), stereotactic radiosurgery (SRS), and MR-guided focused ultrasound (MRgFUS)—are currently employed, each with distinct technical characteristics, efficacy profiles, and adverse effects. In the absence of robust head-to-head comparative trials, clinicians must rely on heterogeneous literature and practical considerations when selecting among these modalities.

METHODS: We performed a narrative literature review describing the historical development and contemporary application of RF thalamotomy, SRS (including Gamma Knife and LINAC platforms), and MRgFUS. Emphasis was placed on technique evolution, reported tremor outcomes, adverse event profiles, and practical considerations influencing modality selection in the absence of direct comparative data.

RESULTS: RF thalamotomy provides immediate and durable tremor suppression via thermally mediated lesioning, with reported contralateral tremor improvement of approximately 70–90% at 6–12 months and persistent neurological adverse effects in 9–14% of patients. SRS achieves tremor control through focused ionizing radiation without incision, with reported good or excellent tremor outcomes in approximately 50–80% of patients, typically with delayed clinical benefit over weeks to months and a low but non-trivial risk of dysarthria, imbalance, or weakness. MRgFUS enables incisionless ablation with real-time MR thermometry and immediate clinical effect. Across cohorts, tremor improvement at one year typically ranges from 70–80%, with most adverse effects being transient; skull density ratio remains a critical determinant of safety and efficacy.

CONCLUSION: No single thalamotomy technique is universally superior. Modality selection reflects trade-offs between immediacy of benefit and latency, anatomical and biophysical constraints, patient comorbidities, and institutional platform availability. Deep brain stimulation remains an important alternative due to its adjustability and reversibility. Future advances will depend on standardized outcome reporting, integration of tractography-based targeting, and improved equitable access to tremor surgery.

Abstract/Poster #: 186
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DIETARY FIBER INTAKE AND INCIDENCE OF DEMENTIA AMONG COMMUNITY-DWELLING OLDER ADULTS

OBJECTIVE: To examine the association between dietary fiber intake and dementia incidence in older adults.

BACKGROUND: Dementia is a devastating cognitive disability among older adults in the United States. Healthy dietary patterns rich in fiber have been linked to lower dementia risk. Fiber may promote brain health by improving glycemic control, regulating gut-brain communication, and reducing inflammation. Fiber intake among U.S. adults is well below recommended levels, and few studies have examined the associations of fiber intake, specifically soluble and insoluble fiber, with incident dementia.

METHODS: We identified 1,515 community-dwelling older participants (80.75±7.14 years old; 75% female) from the ongoing prospective cohort study, Rush Memory and Aging Project, who had no history of dementia at the first Food Frequency Questionnaire (FFQ) assessment and at least one complete clinical evaluation after dietary data. Participants reported their usual diet by completing a validated FFQ from which calorie-adjusted total, soluble, and insoluble fiber (g/day) were calculated. Dementia was determined through annual clinical evaluations and consensus diagnosis using NINCDS/ADRDA criteria. Cox proportional hazards models of censored time to dementia were used.

RESULTS: During 7.62 (± 4.64) years of follow-up, 430 (28%) participants were diagnosed with dementia. Compared to participants in the lowest quintile of total fiber intake, those in the highest quintile had 46% lower risk of dementia after adjusting for age, sex, education, calories, BMI, and physical activity (Q5 vs. Q1: HR=0.54, 95%CI=0.39-0.76, p-trend=0.001). In a sub-sample (n=957) with data on fiber sub-type, soluble fiber intake (Q5 vs. Q1: HR=0.58, 95%CI 0.37-0.91, p-trend=0.048) was associated with lower dementia risk, but associations with higher insoluble fiber intake were not established (Q5 vs. Q1: HR=0.66, 95%CI 0.43-1.01, p-trend=0.033). After further adjusting for vitamin C, vitamin E, folate, omega-3, and lutein, these protective associations with reduced dementia risk were maintained for total, soluble, and insoluble fiber intake.

CONCLUSION: Higher fiber intake, including both insoluble and soluble fiber, was associated with a lower hazard for incident dementia. These findings highlight the potential protective role of dietary fiber in promoting brain health. Further studies are warranted to confirm these associations and explore underlying mechanisms.

Abstract/Poster #: 187
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Theme: Neurodegenerative Diseases and Inflammation
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INVESTIGATING DIAGNOSTIC DELAYS IN NIEMANN-PICK TYPE C (NPC) FOLLOWING AN INITIAL AUTISM SPECTRUM DISORDER (ASD) DIAGNOSIS: A RETROSPECTIVE ANALYSIS AND ITS IMPLICATIONS FOR PROGRESSIVE NEURODEGENERATION

INTRODUCTION: Niemann-Pick Type C (NPC) is a rare, degenerative condition resulting from mutations in genes (NPC1, NPC2). These genes encode proteins responsible for lysosomal cholesterol transport. When impaired, cholesterol is unable to move out of the lysosome. Ultimately, this leads to neurodegeneration due to toxicity from lysosomal storage and lack of cholesterol for normal functions in the cell. Variability in presentation contributes to delayed diagnosis and misdiagnoses with other non-progressive neurodevelopmental disorders can occur. Current therapies stabilize neurologic function, slow disease progression, and improve quality of life, but timely diagnosis remains a challenge.

METHODS: This study aims to evaluate frequency of autism spectrum disorder (ASD) misdiagnosis prior to NPC diagnosis through retrospective chart review of 74 individuals with NPC, to determine if this contributes to delayed NPC diagnosis, and assess if socioeconomic factors impact time to NPC diagnosis (TTD).

RESULTS: Of 74 patients, 42 had neurologic symptom onset (NSO) as first presenting NPC symptom (mean symptom onset 6.94 years). Average TTD following NSO was 4.96 years. A simple regression model found that state decile was not a significant predictor of TTD ($F(1, 36) = .89$, $p = .353$, with an $R2$ of .02, $\beta = .16$ ($B = 4.02$), $t(36) = .94$, $p = .377$, 95% CI [−0.21, 1.04]). Eight (10.8%) individuals were diagnosed with ASD prior to their NPC diagnosis. Of these, one presented with cognitive regression, 5 (62%) had learning difficulties (preceded seizure onset in two), one had developmental delay, and one had early abnormal motor development. There was no statistical difference in TTD following NSO in the ASD group compared to 8 NSO-age-matched individuals (ASD group: $M = 5.44$, $SD = 3.52$; no ASD group: $M= 5.96$, $SD = 3.61$), $t(14) = -.29$, $p = .774$, $d = -.15$.). Qualitative review of these cases by a physician suggests a prior ASD diagnosis likely still delayed further etiologic work up.

CONCLUSION: Although there was no statistical difference in diagnostic delay between groups in this small cohort, it is paramount to consider NPC in the differential diagnosis in individuals presenting with neurodevelopmental symptoms to prevent diagnostic delay and improve patient outcomes.

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ENGINEERED MESENCHYMAL STEM CELL TRANSPLANTATION FOR REDUCTION OF ACUTE INFLAMMATION AFTER SPINAL CORD INJURY

INTRODUCTION: Approximately 17,000 people experience a spinal cord injury (SCI) in the US each year. After a traumatic SCI, there is initially a loss of nervous tissue followed by secondary damage, driven by a chronic inflammation, which is not reversible. Mesenchymal stem cells (MSC) are multipotent stem cells that have been shown to improve multiple SCI outcomes, notably via their anti-inflammatory effects and immunomodulation. However, unlike other tissues, MSCs do not home to sites of spinal cord injury. Further, other studies have shown that MSC transplantations can help reduce the spinal cord inflammation and promote an anti-inflammatory (M2) macrophage polarization. Nevertheless, current methods used to perform these transplants are invasive and involve significant risk for patients. MSCs in mammals do not have E-selectin binding activity because their sialylated (sLeX) motif in CD44 lacks fucose, which is crucial for the cell trafficking and homing.

METHODS: To make MSCs capable of adhering to the endothelial barrier and being trafficked to injury sites, the laboratory of Robert Sackstein generated Hematopoietic cell E-/L-Selectin ligand (HCELL) CD44 glycoform in MSCs by exofucosylation. We administered HCELL-MSCs directly within the vasculature to deliver MSCs to the SCI epicenter (via tail vein) to 60 female Sprague-Dawley rats after they received a moderate SCI (at vertebral T9). We compared the effect of HCELL-MSCs to regular MSC transplantations by measuring rats' thermosensitivity and flow analysis, comparing T cells, microglia, and macrophage population profiles.

RESULTS: Flow cytometry analysis showed that MSCs reduce the expression of immune cells and promote M2 polarization. After HCELL-MSC transplantation, immune cells within the spinal cord exhibit similar levels to those rats that received transplantations of normal [nonfucosylated] MSCs within the cord. Moreover, there is a significant anti-inflammatory macrophage polarization in the rats that were transplanted with HCELL-MSCs. These results indicated that the effect of HCELL-MSCs being transplanted via tail vein is comparable to traditional MSC transplantation.

CONCLUSIONS: HCELL-MSCs showed promising results to modulate the immune response after SCI and enhanced the polarization of anti-inflammatory macrophages, which are known to promote tissue repair in damaged areas. Additionally, these cells offer a minimally invasive method of administration.

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REMODELING OF THE MENINGEAL EXTRACELLULAR MATRIX IN AGING

INTRODUCTION: The meninges, a tri-layered connective tissue that encases the brain and spinal cord, are increasingly recognized as active regulators of central nervous system (CNS) physiology, integrating vascular, immune, and cerebrospinal fluid pathways through a complex extracellular matrix (ECM). Although meningeal dysfunction is linked to impaired glymphatic flow, inflammation, and neurodegeneration, the biochemical composition of the aging meningeal ECM remains poorly defined. This knowledge gap limits understanding of how structural aging at CNS borders contributes to cognitive decline. We hypothesized that our fraction-based proteomic approach would reveal meaningful age-related remodeling of the meningeal ECM in both rats and macaques, producing conserved molecular signatures alongside species-specific patterns. As the first effort to annotate the meningeal matrisome in translational rodent and primate models, this work establishes foundational baselines for cross-species comparison.

METHODS: Whole meninges from Fischer rats and dural tissues from cynomolgus macaques were collected and homogenized separately, then underwent sequential NaCl, SDS, GuHCl, and insoluble-pellet extractions. Fractions were analyzed by LC-MS/MS at UIC. Log_2-normalized spectral counts were used for differential analysis with p- and q-value correction to assess age-associated changes. MatrisomeDB, KEGG, HGNC, and EntrezGene identifiers were used to map rat and macaque proteins to their human ECM counterparts for further comparison and annotation.

RESULTS: Across all samples,>1,800 proteins per species were identified, with broad coverage of the ECM. Significant proteins in macaque dura mapped to distinct aging pathways: older animals showed enrichment in fibrosis and inflammation-associated ECM regulators, younger animals displayed increases in proteins linked to matrix turnover, elastic fiber maintenance, and tissue repair. In contrast, no ECM proteins were significantly altered with age in the rat dataset. This divergence suggests either species-specific meningeal ECM aging or an anatomical effect, as macaque samples consisted solely of dura, whereas rat samples included all three meningeal layers.

CONCLUSION: This study provides the first cross-species proteomic characterization of aging in the meningeal ECM and establishes the first annotated ECM framework for rat and macaque meninges. Our findings highlight the dura as an aging-responsive matrix compartment in primates and establish a translational platform for future biomarker discovery and matrix-targeted interventions to preserve meningeal and CNS health.

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